Place-based Design: An Instructional Design Theory for Supporting Community-based Inquiry and Design Projects

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ABSTRACT

Place-based education has been forwarded as a pedagogical approach that has the potential to contextualize learning, increase student engagement, and strengthen the relationship between schools and the broader community. Despite this promise, however, many teachers struggle to develop learning experiences that incorporate the key components of this approach, including emergent and interest-driven learning. As a result, there is a need for additional instructional models that can provide guidance for designing and implementing place-based learning experiences.

A key goal of this study was to develop a new instructional-design theory that can be used by teachers to engage learners in iterative cycles of community-based inquiry and design. While the theory, which is called Place-based Design, builds on relevant research in place-, democratic-, and design-based education, it was developed as part of this study across two *designed cases*. The first case consisted of an integrated social studies and language arts project where students researched contested places in their community and then designed an Augmented Reality interactive story to teach others about a controversial plan to redevelop a nature conservancy near their school. The second case consisted of an integrated social studies and art project, where students used mobile devices to document everyday art and artists in their community and then used their research to co-design an exhibit at a local children's museum.

Analysis of the designed cases was used to establish the tentative goals, values, methods, and principles associated with Place-based Design. The cases were also used to identify several implementation issues that should be considered when using Place-based Design to guide instruction. By incorporating key practices from design-

based education and providing strategies for supporting emergent learning opportunities, the author posits that Place-based Design has the potential to address some of the gaps in place-based education. Because it is intended as an initial reference model, however, future research is needed to modify, adapt, and refine the current iteration of Place-based Design across more diverse settings and contexts.

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CHAPTER ONE: INTRODUCTION

One of my students, Rochelle, and I are brainstorming ideas for a neighborhood inquiry project our class is working on, when she begins sharing stories about what it was like for her to move from Chicago to Middleton during her freshman year. The transition wasn't easy for her, and two years later, it still isn't. We both laugh when she shares her first experience going to downtown Middleton: "It was small, like something form an old western or something. I was like, 'This is it?'"

Eventually, as part of our project, Rochelle decides to create a map of Roger's Park – her old neighborhood in Chicago – that includes photos and stories about the people and places that were important to her there. Through her work, Rochelle shares her experience with other students, focusing on what she misses about her old neighborhood, as well as some of the challenges she has faced since moving to Wisconsin. Also, she reflects on some of the positive aspects of her move, and suggests ideas for how our school might be able to better help other students who are experiencing a similar transition.

It is just before class and I am setting up the chairs for our opening circle when Andy comes in and tells me that he saw some deer the night before in the conservancy near his house. He is excited, and I tell him to add his sightings to the participatory map our class is making as part of a community-based inquiry project. What excites me about this experience is that Andy is a student who has struggled academically in school and is often disengaged in his classes. Indeed, this was the first homework he had done in our class since the school year started several weeks back. I did not know it at the time, but it also marked the start of a long stretch where he became more and more engaged in the project we were working on. It also marked the start of numerous excursions into the conservancy – a place he had not visited before our class, despite living within walking distance of it.

It is just after 10:00 AM on a school day and Helen is leading me and several other students in our social studies class through the front doors of the mid-size grocery store at the edge of Cross Plains, the small town she lives in. The students and I are doing fieldwork as part of a project we are working on related to local culture, and our task for the day is documenting the variety of tools that people use in Cross Plains. Earlier, Helen, who was serving as our "local guide," brainstormed and selected places we should visit, and is now taking us on the tour she designed. She has connections with a lot of people and places in Cross Plains, and as we walk around, she generously shares her local knowledge and connects us with her network of family, friends, and acquaintances.

The store we are visiting is a regional chain that replaced the independently owned grocery store that used to be in the older section of town. After briefly introducing us to her mother, who works at the store's deli, Helen guides us behind the meat counter and through a door that has a sign hanging on it that reads: "Authorized Personnel Only." As we make our way through the door, and into a small kitchen area, Steve, the butcher, who is in the middle of making a batch of sausage, greets us. The students, armed with cell phones (which they are using to capture videos and photos)

and notebooks, ask Steve a series of questions as he continues working. I also take several photos and contribute my own questions and comments to the conversation. On occasion I prompt one of the students to ask a question or try to connect something Steve says with one of the themes we have been discussing as part of our class. After twenty minutes of talking with Steve, and documenting the stages involved in making landjaeger, we say goodbye and head back though the swinging door that separates the butcher shop from the deli area. Before we leave, Steve hands us a package of smoked sausage, which we eagerly accept. It does not last long, however. We eat it as we make our way to our next stop – a small plastics manufacturer that has become the town's primary employer.

While I could share many more vignettes like this, I could also share ones where students were less engaged, where they openly resisted the learning experiences I designed, exclaimed how bored they were, or showed it through their body language. It is both these "successes" or moments of fluidity, as well as the "set backs" or challenges that keep me teaching and make me curious about how I can improve as a teacher. It is what encouraged me to embark on my journey as a graduate student – where I was sometimes the student who struggled to stay motivated or questioned the relevancy of what I was learning – and eventually, what brought me to writing this dissertation. It is also what keeps me curious about my students' experiences outside of school, as well as their perceptions of the world around them; and what motivates me to design place-conscious projects that engage students in studying local issues and places, provide them with opportunities to share their expertise and perspectives, and cultivate their care for the past, present, and future of our community. Above all, it is what keeps me interested in working with my students to improve our shared learning experiences – to try to make school-based learning something that is meaningful to them, rather than something they feel forced to do.

Purpose of the Study

> Although culture and place are deeply intertwined our relationship with places has been obscured by an educational system that currently neglects them. That is, schooling often distracts our attention from, and distorts our response to, the actual contexts of our own lives (places) (Gruenewald, 2003a, p. 621).

As a high school social studies teacher, I have a history of using a place-based pedagogy in my classroom. One of the things that appeals to me most about place-based education is its emphasis on democratic participation – both in and outside of the classroom (Smith & Sobel, 2010). Unlike traditional approaches towards teaching and learning, which are designed to prepare students for future action, place-based education is rooted in a belief that students are currently capable of – and already are – making contributions to their school and the broader communities in which they live and interact. These values and goals are of particular importance to me as an educator because I work with high school students who have been labeled as “at risk” by our school system. While many of the students I work with have indeed struggled in traditional classroom settings (and certainly have unique learning needs), they also have perspectives and strengths that are too often overlooked, by both the school, and the broader community.

In the past, much of my community-based teaching focused on helping students create and share media through the documentary studies courses I taught. For example, I guided my students as they studied social-political issues through a local lens and then completed documentary video and photography projects to represent their research, as well as their personal perspectives on the issues. It is in this context that I first began exploring the intersection of place- and design-based pedagogies,

whereby media design is used, both as a method for teaching students about design and the theory and practices associated with documentary production, and as a vehicle for engaging them in thinking more critically about their community.

Over the past several years I have been expanding on these initial experiences by partnering with a group of teachers, educational researchers, and community members interested in doing similar work across a wider range of contexts.[1] One of the goals of these collaborations has been experimenting with different strategies for engaging youth in researching cultural and ecological systems in their local community, then designing artifacts (e.g., digital stories, museum exhibits, games) and events (e.g., tours, workshops and community celebrations) to share their findings.

While our initial implementations generated many rich learning opportunities, we also encountered a number of challenges, particularly when attempting to share our practices with other educators interested in doing similar work. One of the main challenges was that many of the teachers we worked with were unfamiliar with the core values of place-based education, and even more so, with methods for implementing this approach. While teachers found it relatively easy to identify local places, topics and issues to guide what they taught, they were less able to change how they taught – e.g., they were less familiar with strategies for organizing emergent community-based explorations, and helping students manage complex projects and open-ended design challenges.

As a result of these experiences, it became clear that we needed to more formally integrate our emergent thinking and practices into a coherent framework that

[1] My primary collaborators during this time were Mark Wagler and Remi Holden. However, I also worked with several teachers at my school – particularly, Robyn Acker who was involved in co-teaching one of the projects discussed in this study.

could be more easily shared, used, and modified by others interested in doing similar work. It also brought to light a need to more formally review and incorporate additional pedagogical approaches, such as design-based and democratic education, that could provide additional guidance, and compliment the core goals and methods associated with place-based education.

Overview

As an extension of this exploratory work, a key goal of my dissertation is to develop a new instructional-design theory that can be used by educators to engage students in iterative cycles of place-based inquiry and design (Reigeluth & Carr-Chellman, 2009a). While the theory, which is called Place-based Design, builds on relevant research in place-, democratic-, and design-based education, it was developed as part of this study across two *designed cases*. The first case consisted of an integrated social studies and language arts project where students researched contested places in their community and then designed an Augmented Reality interactive story to teach others about a controversial plan to redevelop a nature conservancy near their school. The second case consisted of an integrated social studies and art project, where students used mobile devices to document everyday art and artists in their community and then used their research to co-design an exhibit at a local children's museum.

Both of the cases were conducted at Middleton Alternative Senior High (the school where I teach) in collaboration with my teaching colleagues, students, community members, and co-researchers. While I employed an action research methodology, the results of this study are intended to contribute to the broader theory

and practice associated with place-based education, particularly in relation to how democratic and design-based pedagogies might be used to compliment and amplify the core values, goals and methods of this pedagogical approach.

In this opening chapter, I present the core components of an instructional-design theory and briefly describe how instructional-design theory differs from curriculum theory and learning theory. I also introduce Place-based Design – the instructional theory developed as a result of this study – and present a rationale for promoting its use within the larger context of place-based education. Finally, I present the research commitments and questions used to guide the study, and concurrently the development of Place-based Design.

In the second chapter I present the research I used to design the interventions presented in this study. In chapter three I present the methodological approaches I used to guide the design of this study and provide a rationale for why action research and design-based research are appropriate methods for developing an instructional-design theory within a formal school setting.

In chapters four and five I describe the two designed cases (Reigeluth & An, 2009) I used to instantiate the initial versions of Place-based Design. As part of this I describe the key components of each intervention, including the sequencing of activities and methods. In the final chapter I use my analysis of the cases to present the core goals, values, methods, and principles associated with Place-based Design. I also suggest an initial set of implementation issues that should be considered when enacting Place-based Design.

Instructional-design Theory

One way to provide guidance for implementing instruction is through the development of an instructional-design theory (Reigeluth & Carr-Chellman, 2009a). In this section I define what an instructional-design theory is and present a brief argument for why the development of a new instructional-design theory (i.e., Place-based Design) is relevant within the broader field of place-based education.

What is an instructional design theory?

Instructional-design theories are intended to provide "explicit guidance on how to better help people learn and develop. This includes learning and development that is "cognitive, emotional, social, physical, and spiritual" (Reigeluth, 1999, p. 5). Unlike a descriptive theory, which seeks to *describe* how things work, design theories are goal- or solution oriented – they focus on providing guidelines and identifying good methods for attaining given goals (Reigeluth and An, 2006). Another way to describe this difference is that instructional-design theories seek to facilitate "generative outcomes" and assist in creating something new, while descriptive theory seeks to "describe what already exists" (Reigeluth & Carr-Chellman, 2009a, p. 7). It is important to note that instructional-design theories are not typically intended to be highly prescriptive in the sense of providing significant detail of what *must be done* without leaving room for variation (Reigeluth, 1999, p. 7). For example, while an instructional-design theory represents a unique set of goals, values, and methods, it does not represent an exact set of instructions for enacting these.

How are instructional-design theories different from learning theories?

Instructional-design theories are different from learning theories in that they "describe specific events outside of the learner that facilitate learning (i.e., methods of instruction), rather than describing what goes on inside a learner's head when learning occurs" (Reigeluth, 1999, p. 13). In other words, learning theory is the study of how people learn, while instructional-design theory is the study of how to best design instruction so that learning will take place (Reigeluth, 1999).

How are instructional-design theories different from curriculum theories?

While they are interdependent, curriculum design theory deals with *what should be learned and why* (i.e., the content of the instruction, including higher-order thinking skills), while instructional-design theory deals with *how it should be learned* (i.e., what type of instruction should be used to help students learn the content) (Reigeluth & Carr-Chellman, 2009a, p.10). For example, a curriculum-design theory may advocate and provide a rationale for the inclusion of more racial diversity in a social studies curriculum, while an instructional-design theory may focus on presenting guidelines for designing instructional methods to help students learn the skills, concepts, and dispositions associated with this goal.

In reality, while they are separated here for explanatory purposes, instructional-design and curriculum theories are often interconnected. That is, curriculum theories can offer guidance for methods of instruction, while instructional-design theories can offer guidance for what to teach (Reigeluth, 1999). For example, an instructional-design theory associated with teaching about racial diversity may present guidelines for designing instructional methods that are themselves culturally appropriate. Similarly, it

would be ironic (although not uncommon) for teachers to present curricular content about democratic participation using instructional processes and methods that are undemocratic. It is therefore important to seek alignment between content goals and instructional goals and practices.

Why develop an instructional design theory tied to place-based education?

From a teaching perspective, one benefit of design-oriented theories is that they can be applied to educational problems – i.e., they provide guidance for educators on how to solve problems and achieve instructional goals (Reigeulth, 1999). This is relevant to place-based education because research in this area (see literature review in chapter 2) suggests that, while educators may grasp the underlying curriculum goals of the approach, they often need additional guidance for developing instruction that helps them meet these goals (Smith & Sobel, 2010). For example, while presenting examples of students engaged in deep and meaningful place-based inquiries, the literature associated with place-based education provides limited guidance related to specific strategies and methods for engaging students in project-based learning tied to place. In particular, it does not address some of the key issues we encountered when working with students, including: (1) Their inexperience with self-directed learning, (2) Their inexperience collaborating on projects in ways that go beyond the jigsaw method, and (3) Their inexperience using formal design processes and strategies to initiate, manage, and improve their designs. As a result, a major contribution of a new instructional theory to the broader field of place-based education is that it presents a particular set of guidelines (e.g., methods and principles) for how to cultivate place-

based learning experiences – particularly, those that engage students in solving complex, open-ended design challenges.

What are the core components of an instructional-design theory?

In *Instructional-Design Theories and Models*, the influential book series they co-edited, Reigeluth and Carr-Chellman (Reigeluth, 1983; Reigeluth, 1999; Reigeluth & Carr-Chellman, 2009a) present an overview of instructional-design theory, including a discussion of key components, constructs and terms. They also provide a framework for presenting instructional-design theories. I decided to use this framework to introduce Place-based Design because it is commonly used by other educational researchers. Using a common framework makes it easier to highlight the differences (and similarities) between various instructional-design theories.

Instructional methods vs. instructional situations

Reigheluth and Carr-Chellman (2009a) divide instructional-design theory into two main components: instructional methods and instructional situations. Instructional methods prescribe *what to do* to help facilitate learning, while instructional situations include guidance for *when and when not* to use a particular method.

Instructional methods

Instructional methods are “anything that is done purposively to facilitate learning or human development” (Reigeluth & Carr-Chellman, 2009a, p. 21). These are often referred to in part, or in entirety, as strategies, techniques, tactics, and approaches. Methods can be modified and refined across and within instantiations of the theory in an

attempt to cultivate behaviors that align with the learning goals (Snyder, 2009). Table 1 defines some of the characteristics that differentiate instructional methods.

Table 1. Elements of an instructional theory: Instructional Method	
Scope of a method	The amount of instruction with which a method deals – Micro (on an individual level), Meso (on a unit level), Macro (on a course or curriculum level).
Generality of a method	The breadth of instructional situations in which methods should be used. This is on a continuum that ranges from high to low or universal to local. Other descriptors include pervasive, common, restricted, rare, narrow, and local.
Precision of a method	The level of detail of the description of a method. Methods can also be broken down into parts (individual pieces that are combined to produce a method), kinds (describes alternatives from which one must choose when using the method), and criteria (describes criteria one should use when making a decision regarding a method).
Power of a method	The amount a method contributes toward the attainment of the learning goal for which it was selected (between-group variance).
Consistency of a method	The reliability with which a method contributes its power toward the attainment of the learning goals for which it was selected within the *situations* for which it is appropriate (within group variance).
Source: Reigeluth & Carr-Chellman, 2009a, pp. 21-22	

Some questions that can help educators select and develop methods to address particular educational contexts include: What instructional approach or macro-strategy should be used (e.g., problem-based learning, case-based reasoning, design-based learning)? What variable instructional components are most appropriate within that approach (e.g., guided practice, coaching, gallery walks)? How should instruction be sequenced (e.g., simple-more complex problems, or concrete-abstract sequencing)? (Reigeluth & Carr-Chellman, 2009a).

Instructional situation

Instructional situations are “all aspects of an instructional context that are useful for deciding when and when not to use a particular instructional method” (Reigeluth & Carr-Chellman, 2009, p.21). In some instances, these are also referred to as the context and condition (Reigeluth & Carr-Chellman, 2009) (See Table 2 and Table 3).

Some questions pertaining to instructional situations include: What are the valued learning goals or outcomes from the instruction? How should power be distributed among those in the instructional interaction? How is the nature of the content, learner, and instructional environment likely to influence the selection of the instructional methods? How are instructional development constraints or limitations likely to influence the selection of instructional methods? (Reigeluth & Carr-Chellman, 2009).

Instructional situation: Values

Values describe the guiding principles or beliefs used to develop a particular instructional-design theory. Because they permeate the theory, values influence both how the instruction is designed and how it is delivered (Snyder, 2009, p. 50). Values can be about ends (e.g., what values shape the learning goals?), criteria (e.g., what values determine whether the methods and guidelines are successful?), means (e.g., what instructional methods are valued?), and power (e.g., who has the power to make decisions about the previous three?). When combined, this collection of values represents a “philosophy of instruction” (Reigeluth & Carr-Chellman, 2009a, p. 23). See Table 2 for additional detail about each of these values.

Table 2. Elements of an instructional situation: Values	
What set of values is this theory based upon? (Opinions about what is important).	**Values about ends** (Values about learning goals) – Statements about what learning outcomes are valued philosophically (opinion) vs. determined empirically through a needs analysis.
	Values about criteria (Criteria for successful instruction) – Statements about what priorities should be used to judge the success of the instruction. Values about priorities address the relative importance of the effectiveness, efficiency, and appeal of the instruction as criteria for judging how good the instructional methods and guidelines are.
	Values about means (Values about instructional methods) – Statements about what instructional methods are valued from a philosophical point of view (opinion). These stand in contrast to selecting methods empirically based on research results.
	Values about power (Who has power to make decisions about the previous three?) – Statements about who is given / has the power to make decisions about goals, priorities, and methods.
Source: Reigeluth & Carr-Chellman, 2009a, pp. 22-23	

It is important to distinguish between the values of the individual(s) who designed and articulated a particular instructional theory and the values of the individual(s) who apply the theory. Ideally, while these should be in alignment, this is not always the case (Oswald, 2003, P. 9). Instead, a values drift can occur (and one could argue should occur) once the theory is picked up, interpreted, and modified by educators and learners at the site of instruction. As a result, Reigeluth and Carr-Chellman (2009a) suggest that analysis of an instructional theory should be sensitive to how it is implemented at the instructional level. In their words: “The values of the designer [of the theory] are less important than the values of the ‘owners’ of the instruction, the teachers, the learners, and the other beneficiaries (e.g., employers and communities)” (p. 23).

Instructional situation: Conditions

Conditions are all of the factors (other than values) that influence the selection or effects of a particular method. A key question commonly used to frame conditions is: In

what situations – including the instructional conditions and desired outcomes – are the methods appropriate and inappropriate (Reigeluth & Carr-Chellman, 2009a, p. 10)? This includes the conditions under which certain methods, variations of methods, or combinations of methods should be used (Oswald, 2003, p.9). For example, a teacher would not highlight a desire for students to learn simple procedures (e.g., opening and saving a word processing document) using an instructional-design theory with pre-conditions that specify its use when helping students engage in solving complex design problems (Oswald, 2003, p.10).

Reigeluth and Carr-Chellman (2009a) point out that conditions are similar to context. However, they add that not all aspects of context influence when a particular method should or should not be used. They give as an example a context in which the learners come from households with low socio-economic status (SES). In some instances, students' SES is highly relevant and should influence the selection of instructional methods. In other instances, this may not matter as much, in that some methods are relevant and should be selected regardless of a student's SES (p. 23).

Table 3. Elements of an instructional situation: Conditions

All other factors that influence the selection or effects of methods. This is similar to context, but the context by default does not impact methods.	**Content** – The nature of what is to be learned. Defined comprehensively to not only include knowledge, skills, and understandings, but also higher-order thinking skills, metacognitive skills, attitudes, values, etc.
	Learner – The nature of the learner, including prior knowledge, learning styles, learning strategies, motivations, interests, etc.
	Learning environment – The nature of the learning environment, including human resources, material resources, organizational arrangements, etc.
	Instructional development constraints – The resources available for designing, developing, and implementing the instruction, including money, calendar time, and person hours.

Source: Reigeluth & Carr-Chellman, 2009a, pp. 23-25.

Universal vs. situational methods

Universal methods are those that should be applied in all instantiations of a particular instructional theory. Situational methods, on the other hand, apply in only some situations. Situational methods can be placed on a continuum from those that are close to being universal (almost always applied) to those that are highly situational (local or very rarely applied) (Reigeluth & Carr-Chellman, 2009b). Situational methods are intended to provide more precise guidance to educators using a particular instructional-design theory. For example, while “use practice” is a universal method commonly included in many instructional theories, the type and quality of that practice might differ depending on particular situations.

Research Commitments

This combined action- and design-based research study was initiated as a method for developing Place-based Design, an instructional-design theory intended to support students as they engage in sustained, collaborative cycles of place-based inquiry and design. In addition to informing my own teaching practices, a key goal of the study is to further develop, refine and articulate Place-based Design so that other teachers can use it to engage their students in place-based learning that includes a strong design component. While the study presented here was guided by targeted research questions, it was also developed using the following interconnected commitments:

1. Help my students plan, manage, and complete sustained place-based inquiry and design activities.

2. Develop a framework that can be used as a reference model to foster collaboration and exchange of ideas between students, myself, community partners, and colleagues – in particular, teachers and staff members at my school, as well as educational researchers and educators I work closely with in both formal and informal contexts. In part, this goal is driven by the local needs of the school I teach in, especially in relation to a recent initiative to develop and refine strategies for engaging more students in place-based learning.
3. Develop and share Place-based Design as a *work in progress* with teachers and researchers outside of our local school setting, so that it can be assessed, adapted, refined, and distributed across more diverse settings and contexts. This includes presenting a rationale for the framework within the larger context of place-based education; articulating the underlying theoretical commitments; establishing the tentative goals, values, and methods associated with the approach; and establishing an initial set of design principles that can be used to help others enact place-based design in their own context.
4. Identify the next steps, including additional research studies and questions, needed to further refine and improve Place-based Design.

Research Questions

The primary goal of this study is to develop Place-based Design, a tentative instructional-design theory – including core goals, values, and methods – that combines core elements of place-based, design-based, and democratic education. As a result, three primary questions guided this study:

1. What are the core goals, values, and methods associated with Place-based Design?
2. What design principles are central to Place-based Design?
3. What issues should be considered when implementing Place-based Design within a formal school setting?

In addition to referencing previous research in place-based, design-based, and democratic education to answer these questions, I also used findings from the two designed cases. In particular, my focus during the cases was on understanding students' experiences in relation to key components and events in each intervention and identifying challenges they (and we) faced when implementing this approach. The following questions were used to guide this line of inquiry:

1. How do students describe and frame their experiences learning within this context?
2. How do teachers describe and frame their experiences teaching within this context?
3. What unique challenges and opportunities emerge when Place-based Design is implemented within a formal school setting?

CHAPTER TWO: LITERATURE REVIEW

In this section I present the key pedagogical approaches I borrowed from, and combined, to build the designed cases in this study, and subsequently, Place-based Design. While rooted in research and practice associated with place-based education, Place-based Design is also influenced by theory, research and practice tied to design-based education and democratic education. In this chapter I present the common goals, values, and instructional methods embedded in each of these approaches. I also explore how each of these approaches conflicts with traditional models of education and present some common challenges teachers encounter when attempting to implement them within traditional school settings.

Place-based Education

While it includes key components of design and democratic education, Place-based Design has at its core a commitment to the philosophy and practices of place-based education. It is the study of local places – their cultural and ecological systems – that provides the primary context for learning experiences and curricular activities, including students' design work. In this section I provide an overview of place-based education, discuss how it differs from traditional models of schooling, and present several frameworks that can be used to plan and implement place-based interventions.

What is place-based education? – Basic definitions

Despite diversity in how it is conceptualized and implemented, there are some common characteristics that connect the research and practice surrounding place-based education. In this section I synthesize commonly used definitions of place-based education and describe core components of this pedagogical approach. I also compare

place-based education with traditional models of schooling and highlight some of the challenges encountered when attempting to initiate place-based learning in formal school settings.

Place-based education: *Going* local

> Almost everyone has had occasion to look back upon his [sic] school days and wonder what has become of the knowledge he [sic] was supposed to have amassed during his years of schooling . . . but it was so segregated when it was acquired and hence is so disconnected from the rest of experience that it is not available under the actual conditions of life (Dewey, 1938/1997, p. 48).

Despite having deep roots in environmental education, the "big tent" of place-based learning has evolved over time to include a range of educational approaches, including cultural journalism, ecological education, local entrepreneurialism, and service learning (Gruenewald, 2003a; Kahn, 2010; Orr, 2004; Smith, 2002a; Smith & Sobel, 2010). At the center of each of these approaches, however, rests a commitment to situating students' school-based learning experiences within the local community. In this regard, place-based education can trace its lineage to the work of John Dewey, especially his emphasis on connecting school-based learning with students' everyday life (Dewey, 1938/1997). According to Dewey, educators should not only understand the importance of situating students' learning in real-world contexts, but also be capable of making connections between these contexts and the curricular experiences they design:

> A primary responsibility of educators is that they not only be aware of the general principle of the shaping of actual experience by environing conditions, but that they also recognize in the concrete what surroundings are conducive to having experiences that lead to growth. Above all, they should know how to utilize the surroundings, physical and social, that exist so as to extract from them all that they have to contribute to building up experiences that are worthwhile (Dewey, 1997, p.40).

Gregory Smith (2002), a leading place-based learning researcher and practitioner highlights this connection with Dewey, while also pointing out that many of Dewey's concerns about schooling, although expressed over 75 years ago, continue to plague education today:

> By focusing on students' local context, proponents [of place-based learning] address one of John Dewey's major concerns about 19th century public schools that still applies to this century: the lack of connection between formal schooling and students' lives, a disconnect that makes learning an imposed chore rather than an opportunity to explore questions that arise from students' innate curiosity and desire to become competent and contributing members of their families and communities (Smith, 2002a, p. 30).

Place-based education attempts to address this school-community disconnect by contextualizing learning around the study of local ecological and cultural systems. According to the Rural School Community Trust (2003), "place-based education is learning that is rooted in the local – the unique history, environment, culture, economy, literature, and art of a particular place" (Williams, 2003, p. i). Gruenewald and Smith (2008) build on this basic definition by introducing a systems-based component. They define place-based education as a framework that draws on "local phenomena as the source of at least a share of children's learning experiences, helping them to understand the processes that underlie the health of natural and social systems essential to human welfare" (p. xvi). Similarly, Brooke (2003) defines place-based education as schooling that "focuses on the necessary relations – cultural, natural, agricultural – that shape a given place and its human communities…" in a way that encourages students to "imagine the world as intradependent, filled with a variety of locally intradependent places" (p.6). Orr (1992) adds an additional dimension by arguing

that place-based education should explore cultural and ecological systems and their relationship(s) across *time and space*.

While there are many entry points for engaging in place-based education, Gruenewald (2003a) provides a framework for designing what he refers to as "place-conscious" learning experiences. He introduces the framework by discussing five dimensions of place derived from various disciplines and cultural traditions. The five dimensions are: phenomenological, sociological, ideological, political, and ecological. Despite exploring each of these dimensions independently, Gruenewald emphasizes that they compliment each other and should be combined and cross-fertilized to guide theory, research and practice in place-based education:

> Sociological, ecological, and socio-ecological perspectives on place are juxtaposed and overlaid to emphasize the diversity of perspectives on place and to highlight the need to elaborate both cultural and ecological analyses as place-based education is developed (p. 623).

In order to turn these dimensions into "pedagogical pathways," Gruenewald encourages educators to look to and revive educational traditions that have a natural inclination to, and already embody one or more of the dimensions of place. The educational traditions he presents as starting points are: natural history, cultural journalism, and action research. He warns, however, that while each of these traditions emphasizes place, they also come with institutional discourses and structures that can be used to reify traditional practices, hierarchies, and inequalities. In other words, Gruenewald reminds us that place-based education is not by default a pedagogy aimed at transformation. Instead he reminds place-based educators to ask questions such as: Who is benefiting from this approach and how? He also encourages place-based

researchers and educators to consider the perspectives of cultural anthropologists, eco-feminists, bio-regionalists, and critical geographers, as they develop and assess place-based learning experiences.

Curriculum integration

Helping students understand the complexity and dynamic interconnectedness of local systems requires an educational approach that is itself integrated and multi-disciplinary. According to Smith and Sobel (2010), place-based education should "encourage educators to look beyond the language and methods of their own fields to explore problems and projects that open the possibility of cross-disciplinary dialogue" (p. 23). In their view, place-based education provides an opportunity for students to explore authentic, open-ended problems in a manner that helps them "grapple with the messy cross-disciplinary nature of humankind's current dilemmas" (pp. 21-22).

By emphasizing the importance of integrated curricula and inquiry, place-based education can once again be linked with Dewey. For example, Dewey (1900/1915) notes the affordances of using the local context as a starting point for producing "unified studies" that emerge from the dynamic and integrated nature of cultural and ecological systems:

> We live in a world where all sides are bound together. All studies grow out of relations in the one great common world. When the child lives in varied but concrete and active relationship to the common world, his studies are naturally unified. It will no longer be a problem to correlate studies. The teacher will not have to resort to all sorts of devices to weave a little arithmetic into the history lesson, and the like. Relate the school to life, and all studies are of necessity correlated (Dewey, 1900/1915, p. 80).

One of the challenges of implementing multi-disciplinary inquiries, however, is that it runs counter to the traditional subject-centric approach commonly used to

organize school-based learning. Most schools, especially in middle and high school, are structured around “silos of learning” where classes are organized by subject area and interdisciplinary efforts tend to combine two subjects together – versus a model of integration where multiple perspectives and disciplines are drawn upon in response to the unique needs that emerge from a particular inquiry (Tyack & Tobin, 1994; Tyack & Cuban, 1995).

Place-based education: *Doing* local

While place-based education is concerned with building students’ understanding of key concepts and skills through interactions with real-world contexts, most definitions go beyond this requirement and include a component that encourages educators to engage students in exploring questions, issues, and problem spaces that are relevant to both students *and* the local community. This shift is important in that it highlights two additional aspects of place-based education. One, while place-based education is concerned with meeting the learning goals set by schools and students it also actively seeks to impact the health of the community. Two, as an extension of this goal, place-based education seeks to cultivate an ethic of shared community problem solving (Smith & Sobel, 2010), whereby youth (and schools) are seen as resources for promoting the “common good” of their local communities, and vice versa. According to the Rural School and Community Trust (2003):

> [In place-based learning] the community provides the context for learning, student work focuses on community needs and interests, and community members serve as resources and partners in every aspect of teaching and learning. Together we have discovered that this local focus has the power to engage students academically, pairing real world relevance with intellectual rigor, while promoting genuine citizenship and preparing people to respect and live well in any community they choose. Place-based learning helps schools and communities get better together (Williams, 2003, p. i).

This action or practice-oriented approach differs from traditional models of civics education, which are often based on preparing students for *future* civic action. Instead, place-based learning positions students as presently capable of and already engaging in the civic fabric of their community. This perspective aligns closely with Lay and Biesta's (2006) model of *citizenship-as-practice*, which emphasizes that citizenship is not a predetermined set of knowledge that can be disseminated to students, but rather something that is situated in day-to-day interactions, choices, and dispositions. As a result, it is not sufficient for students to read about, or hear others talk about local democratic systems and practices – they need opportunities to have "firsthand experience[s] of local life" (Gruenewald, 2003a, p.620) through which they can activate and develop the skills, practices, and ethos associated with responsible community engagement (Gruenewald & Smith, 2008). According to Melaville, Berg, and Blank (2006) place-based learning helps serve this function:

> [C]ommunity-based learning helps students acquire, practice, and apply subject matter knowledge and skills. At the same time, students develop the knowledge, skills, and attributes of effective citizenship by identifying and acting on issues and concerns that affect their own communities. When implemented thoughtfully, these strategies create a pedagogy of engagement. Students invest time and attention and expend real effort because their learning has meaning and purpose (Melaville, Berg, & Blank, 2006, p.3).

Table 5. Common Characteristics of Place-based Learning	
Community-based	• Inquiry takes students out of the classroom (e.g., into the schoolyard and/or local community/natural areas). • Field activities support classroom-based activities (and vice versa). • Learning goals and activities are emergent and emphasize local themes, systems, content, and questions. • Learning experiences make connections between the local and global (and vice versa).
Unified and Authentic Learning	• Students engage in projects where they produce new knowledge, answer authentic inquiry questions, and solve "real problems" (i.e., action oriented). • Direct instruction occurs "just-in-time" and is typically embedded within authentic contexts. • Learning is integrated and multi-disciplinary.
Student-Centered / Collaborative	• Inquiries stem, in part, from learners' personal questions, interests, needs, and learning goals. • Students play an active role in defining and shaping projects (i.e., student voice). • Students collaborate with local citizens, organizations, agencies, businesses, and government to help make plans that shape the future of their cultural and ecological systems.
Action Oriented	• Learning activities contribute to the cultural and ecological quality of the community. • Local learning serves as the foundation and context for understanding and participating in regional and global action.
Source: This table was generated by combining definitions and characteristics of place-based education from the following sources: Knapp & Woodhouse, 2000; Promise of Place, n.d.; Smith, 2002b; Smith and Sobel, 2010.	

Re-mediating place

One potential benefit of place-based education is that it helps narrow the divide – and resulting isolation – that many schools, students, and teachers develop in relation to their local community (Smith & Sobel, 2010). Students' school-based interactions working in and with their community re-mediates their experience of place and helps them develop new understandings and awareness of place. As they engage in community-based inquiries and projects, students build on prior experiences and develop new ones; visit new places and explore familiar ones in new ways; and encounter new people and perspectives. They also explore their community via new

identities, for example as community activists, ethnographers and citizen scientists (Squire, 2011).

These experiences have the potential to advance another goal of place-based education – namely, developing students' sense of place, or empathetic connection to a place, as well as their sense of agency in being able to act upon and improve that place (Sobel, 1996). According to Smith (2007):

> Cultural and historical investigations can direct students' attention to local assets that might otherwise remain invisible to them, underlining what is valuable in their home communities and regions and potentially deepening their connections and commitment to place. Acquaintance with the local environment through monitoring activities or field studies can similarly enhance young people's familiarity with what is beautiful and worth preserving in the territory they call home (Smith, 2007, pp.191-192).

In their book *Place value: An educator's guide to good literature on rural lifeways, environments, and purposes of education*, Haas and Nachitigal (1998) describe five areas they believe to be critical to cultivating students' connection to place: a sense of place, or living well ecologically; a sense of civic involvement, or living well politically; a sense of worth, or living well economically; a sense of connection, or living well spiritually; and a sense of belonging, or living well in community. Haas and Nachtigal, argue that schools should help students explore what it means to "live well" – both individually and collectively – across each of these areas. They also stress that educators should examine and resist the values and practices that disconnect youth from their local places and encourage them to look beyond their local community for definitions of success and happiness.

Despite the potential of place-based education to cultivate a sense of place, it is important to remember students' varied experiences (which are not always positive) and

identity(-ies) tied to place (Moje, 2004). It is also important to acknowledge the tendency of some instantiations and models of place-based education to promote a romantic or idealized notion of community and place (Nespor, 2008; Smith, 2007). Nespor (2008) raises this point in his critique of place-based education:

> Rather than forcing us to carefully distinguish among different historical, geographical, cultural, political, economic, and other dimensions of place construction, or to look at issues of strategy, power, cooperation, and exploitation in their uses, the connotations of ‘‘community’’ make it possible simply to orient place-based education’s theoretical discourse around an idealized image of ‘‘place’’ as a stable, bounded, self-sufficient communal realm (pp. 248-249).

One strategy for addressing this concern is exploring how other fields outside of education have conceptualized place. In turn, constructs from these fields can be used to assess and plan place-based interventions. Because they are concerned with studying how humans interact with and shape space and place, a natural starting point for this inquiry is the field of critical geography. Barnes and Gregory (1996) pose that critical geography seeks to make visible the “taken-for-grantedness of everyday life” by exposing “how the worlds which we inhabit are the processes operating over varying timescales whose outcomes could have been different: thus there is nothing inevitable about the [world or its] processes operating over varying geographical scales which join our lives to those of countless others (p. xii).

Instead of seeing places as fixed, with singular identities and linear histories, critical geographers such as Doreen Massey (1994) and Edward Soja (1989) focus on the dynamic and contested nature of place – that “[p]lace, both as a concept and as a discrete space on the earth, is a contested terrain” (Schneekloth & Shibley, 2000, p.132). Massey (1994) highlights the unfixedness and multiplicity of place and draws

attention to the political and contested nature of placemaking. She frames places as "open and porous" with identities that are "always unfixed, contested and multiple":

> All attempts to institute horizons, to establish boundaries, to secure the identity of places, can in this sense therefore be seen to be attempts to stabilize the meaning of particular envelopes of space-time . . . For such attempts at the stabilization of meaning are constantly the site of social contest, battles over the power to label space-time, to impose the meaning to be attributed to a space, for however long or short a span of time (p.5).

Within the context of place-based education, the work of critical geographers is useful in drawing attention to the interrelationships between space, place, identity, knowledge, and power and how these come together in the (re-)production of places – in how we conceptualize and inhabit them (Harvey, 2001; Keith & Pile, 1997, Massey, 1994; Soja, 1989). As a result, they provide both a theoretical foundation for moving place-based education in a more "critical" direction, and a lens for understanding why, and how, this move might be resisted by schools.

Critical pedagogy of place

Despite foregrounding the role of youth and school involvement in improving the health of local communities, place-based education has been criticized for lacking a critical perspective (e.g., simply celebrating current cultural practices without emphasizing how these might reify inequalities or amplify ecological degradation) (Smith, 2007). In response to this concern, David Greunewald (2003b) advocates for combining the core tenants of place-based education with critical pedagogy. The resulting construct, which he refers to as a *critical pedagogy of place* draws from, and combines, the traditions of critical pedagogy (Friere, 2005; Giroux, 1988), place-based

education (Smith, 2002a), ecological education (Orr, 1992), eco-justice (Bowers, 2001), eco-pedagogy (Kahn, 2010), and critical geography (Harvey, 1996; Massey,1994).

While place-based education challenges traditional models of teaching and learning and seeks to engage students in civic participation, a critical pedagogy of place pushes this idea further by "bringing cultural and ecological politics into the center of place-based discourse" (Gruenwald, 2003b, p.11). While agreeing that developing students' empathetic connection to places and engaging them in civic action is important, Gruenewald argues that this should be done in the service of getting students to perceive and act upon the oppressive social, political, and economic elements that shape how people inhabit the world. Along with Gregory Smith (2008), he writes:

> Young people need an education that affirms their capacity to solve problems and contribute to the welfare of others, an education that speaks to the importance of diversity and adaptation and equity and shared power. When place-based education is implemented in ways that truly conjoin school with community and that provide opportunities for democratic participation and leadership, children are given the chance to partake in the collective process of creating the sustainable and just world that must come to replace the world of discrimination and waste that has begun to unravel around us (p. 346).

Building on the work of critical pedagogues such as Haymes (1995), Giroux (1988), and Friere (2005), Gruenewald argues that this goal can be achieved by cultivating experiences that guide students through the connected processes of decolonization and re-inhabitation (Orr, 2003; Greunewald, 2003b). Decolonization involves "learning to recognize disruption and injury and to address their cause" (p.9), while re-inhabitation involves "learning to live well socially and ecologically in places that have been disrupted and injured" (p.9). A key goal of these interconnected processes is "coming to understand and resist the ideas and forces that allow for the privileging of

some people and the oppression of others – human and other-than-human" (2009, pp. vi-viii), as well as recovering and renewing traditional cultural patterns that promote ecological and cultural sustainability (Bowers, 2001/2008).

Based on Gruenewald's framework (2003b), a *critical pedagogy of place* aims to "(a) identify, recover, and create material spaces and places that teach us how to live well in our total environments (reinhabitation); and (b) identify and change ways of thinking that injure and exploit other people and places (decolonization)" (p.9). By applying a critical pedagogical lens to place-based learning, Gruenewald challenges educators to go beyond simply viewing local places as content repositories, to viewing them as sites with transformational potential, for individuals and groups.

Gruenewald's call for a critical pedagogy of place produces two promising directions for place-based education. First, it provides a framework that encourages shared conversation across different approaches to place-based education – those rooted in ecological and rural contexts, and those rooted in social justice and urban traditions. Second, while still maintaining the primacy of place, and paying attention to the unique needs and opportunities that emerge from particular places, a critical pedagogy of place provides some overarching questions that can be used as starting points for place-conscious inquiries. The biggest of these include: *What happened here? What is happening now? What should happen here?*

When answering these questions, a critical pedagogy of place encourages educators to use a blended inquiry approach that combines cultural and ecological approaches, and considers the diverse cultural perspectives embedded in a particular place. It also encourages educators to consider how the concepts of decolonization and

reinhabitation might be leveraged in order to make curricular decisions that combine place, inquiry, and action. Again, Gruenewald provides direction by posing four guiding questions: *What needs to be conserved in this place? What needs to be transformed in this place? What needs to be restored in this place? What needs to be created in this place?* In addition to opening discussion and inviting multiple perspectives, these questions provide entry points for ethical, historical, cultural, and personal considerations of place. Perhaps most importantly, they emphasize the dynamic, unfixed nature of places; seek to uncover and address the underlying power imbalances that shape places; and encourage active exploration and action tied to our individual and shared visions of what places might and can become (Gruenewald, 2008, p. 149).

Place-based education and new localism

New localism is a broad social movement aimed at reclaiming local cultural and ecological systems within the broader context of globalization. It is commonly used to describe trends associated with localized food distribution and consumption, alternative currencies and economies, and micro financing. While some of these trends are supported by formal institutional efforts, such as grants and government initiatives, they are also driven by individuals and grassroots groups interested in working together to sustain the health of their local cultural, ecological, and economic systems. According to Gruenewald & Smith (2008):

> [N]ew localism has emerged in part as a response to patterns of economic development that disrupt, rather than cultivate, community life. Many communities across the nation and across the globe recognize that economic globalization, however inevitable and beneficial it may be to some, is far from the unconditional good it is often claimed to be (p. xii).

Eco-localism, a specific manifestation of new localism, is an economic theory that rejects globalization and embraces the development of local economies as the most desirable way to secure environmental sustainability. According to Curtis (2003),

> [Eco-localism] is the perspective embodied in local currency systems, food co-ops, micro-enterprise, farmers' markets, permaculture, community supported agriculture (CSA) farms, car sharing schemes, barter systems, co-housing and eco-villages, mutual aid, home-based production, community corporations and banks, and localist business alliances (p. 83).

Similar to place-based education, the values embodied in new localism include: "social and environmental responsibility, health of the community, stewardship of nature, affection for and commitment to place, fidelity, propriety, and sufficiency" (Curtis, p.86).

New Localism provides a concrete and pragmatic look at how the local can provide both a context and motivation for learning, individual and collective action, and civic engagement. In the introduction to their book, Place-based Learning in a Global Age, Gruenewald and Smith (2008) draw a connection between place-based education and new localism. They suggest that place-conscious education can serve as a grassroots movement that inspires people to reinvest in their local cultural, ecological, and economic systems, as a way to counter the pressures of globalization:

> Just as new localism can be understood as diverse acts of resistance against the ravages of globalization and rootlessness, place-based education can be understood as a community-based effort to reconnect the process of education, enculturation, and human development to the well-being of community life (p. xvi).

In this regard, the current movements towards new localism have the potential to spark interest in and amplify place-based learning. This can already be seen to some extent in the growth of curricula and programming associated with local foods and

sustainability. What remains to be seen, however, is the extent to which schools can tap into these initiatives given their entrenched structures, values, and practices. For example, can incorporating some of the values and practices of new localism put pressure on traditional school practices, or will these movements simply be co-opted and modified by schools to fit the existing paradigm?

Challenges to implementing a critical pedagogy of place

Despite the transformational potential of place-based education, there are many obstacles associated with implementing this approach within traditional school settings (Gruenewald, 2007; Smith, 2007; Stevenson 1987/2007). While many educators focus on practical constraints, such as limited resources, lack of time, and high student-teacher ratios, it is equally important to question the deeper discourses or "grammar of schooling" (Tyack & Cuban, 1995) that make place-based education difficult to implement. It is also important to consider the difference between conceptualizing place-based education as a methodology versus an educational philosophy that is rooted in particular values and beliefs about teaching and learning, and more generally, about what it means to "live well" in the world (Gruenewald, 2008). In contexts where the former perspective prevails, place-based education sheds some of its critical components. As a result, local places provide content and context for learning, but the mode of instruction and the learning goals remain fairly static.

In this section I present three frameworks that can be used to explore the main differences between place-based education and more traditional models of schooling. The first framework, Stevenson's Gap (Stevenson 1987/2007), explores discrepancies between the pedagogical and cultural goals of environmental education and those of

traditional schooling. The second framework presents differences between place-based educational experiences rooted in an algorithmic paradigm and those rooted in a generative paradigm (Loynes, 2002). The third framework, Beames' dimensions of outdoor education, presents a critique of traditional approaches to experiential education, particularly their emphasis on scripted learning activities and superficial connections to place (Beames, 2006).

Presenting these frameworks serves several purposes. First, it highlights how place-based learning differs from traditional schooling, not only from a methodological standpoint, but also epistemologically. Second, it further distinguishes between content-centric and more transformative and critical place-based pedagogies. Third, it helps identify some of the potential tension points that can surface when place-based pedagogies are forwarded within formal school settings. Fourth, it provides starting points for planning and assessing place-based curricular interventions at different scales – e.g., from the classroom or unit level to the school or district level (Beames, 2006).

Stevenson's Gap.

In 1987, Robert Stevenson wrote a seminal article within the field of environmental education highlighting a fundamental gap between the traditional purposes of schooling – as evidenced through its ideological, structural, pedagogical, and curricular practices – and the cultural and pedagogical goals of ecologically focused education (Gruenewald, 2007; Hacking, Scott, & Barratt, 2007; Smith, 2007; Stevenson, 1987/2007). In the article, Stevenson (1987/2007) contrasts the critical and political action-oriented goals of environmental education with the "uncritical role of schooling in

maintaining the present social order" (Stevenson, 2007, p. 139). He begins his analysis by discussing the conservative nature of schools from an historical perspective:

> [S]chools, and hence classrooms, were structured to present basic information, to enable the practice of routine skills, and to maintain existing social conditions and relations. Given the universality and stability of their structural organization over almost two centuries, it seems that schools in the form of classrooms generally are efficient in meeting the above purpose. Historically then, schools were not intended to develop critical thinkers, social inquirers and problem solvers, or active participants in environmental and political (or even educational) decision making. Put simply, their intended function was not to promote social change or reconstruction (p. 144).

Similar to Tyack and Cuban's' exploration of the "grammar of schooling" (Tyack & Cuban, 1995; Tyack & Tobin, 1994), Stevenson attributes schools' ability to resist change to particular *regularities* (see Table 6), including: an over reliance on teachers as primary information sources; the presentation of standardized knowledge associated with established disciplines; structures and practices aimed at controlling students; and standardized, hierarchical assessment procedures (Smith, 2007, p.189; Stevenson, 1987/2007).

Stevenson's work draws attention to the tensions that arise when teachers and students enact place-based education, especially when it emphasizes ideological and critical inquiry.

> Such educational ideals . . . conflict with the dominant practices in schools, which emphasize the passive assimilation and reproduction of simplistic factual knowledge and an unproblematic 'truth'. These practices are then explained by examining the structural organization of schools, the primacy of demands on teachers to maintain order and control, and teachers' presuppositions about knowledge and teaching (Stevenson, 2007, pp. 139-40).

While Stevenson's work focuses on environmental education, it is applicable to other models and instantiations of place-based education. In particular, it is useful when

trying to understand some of the factors that impact how place-based learning is taken up in different contexts. It also sheds light on why many instantiations of place-based education focus on the local context as a vehicle for learning without foregrounding deeper philosophical or critical inquiry components (Smith, 2007).

Table 6. Stevenson's Gap: Irregularities between traditional schooling and environmental education.

	Traditional Schooling	Environmental Education
Goals and Curriculum Framing	The mastery of many fragmented facts, concepts and simple generalizations organized loosely within discrete bodies or fields of study. A discipline-based approach with emphasis on abstract theoretical problems.	Learners working individually and collectively towards the resolution of current environmental problems. An interdisciplinary approach with a focus on real practical problems.
Determination of Curriculum and Pedagogy	Predefined and unproblematic with knowledge dissemination to the fore; predefined since they are designed to serve predetermined specific ends whose efficient achievement can be readily assessed and which are clearly defined by criteria.	Emergent and problematic in the sense of students (and teachers) solving environmental problems. Content arises as students are involved in specific environmental problems. Highly flexible; for example, as well as adapting to students' own social constructs, the teacher should be amenable to students' decisions in relation to both their learning and their actions.
Function of Knowledge	Storage for future use and the enhancement of individual status and economic well-being.	Immediate use for the social value of a sustainable and emancipated quality of life.
Development of Knowledge	Knowledge is acquired individually for use in later life.	The development of knowledge, skills and values is not only directed towards action, but emerges in the context of preparing for inquiry and taking action.
Teaching and Learning Processes	The teacher as dispenser of factual knowledge. Official student participation is usually limited to making short oral (or, less frequently, written) responses to teacher questions which elicit 'largely recitation of information already defined by the teacher or textbook. Learning is atomistic and individual.	Teaching and learning are intended to be co-operative processes of inquiry into and action on real environmental issues. Such an inquiry process demands that students actively engage in critical or complex thinking about real problems. Learning is holistic and co-operative.
Role of Students	Students are usually in the passive position of spectators and recipients of other people's knowledge and thinking. The acquisition of knowledge precedes its application. Student thinking is confined to applying factual information to familiar 'well-structured' problems: that is, problems with unambiguous definitions and goals, and a single correct solution which has already been determined.	Active thinkers and generators of knowledge; learning and action proceeding hand in hand.

Sources: Hacking, Scott, & Barratt (2007) and Stevenson (1987/2007).

Algorithmic-generative paradigm.

Another framework that can be used to weigh place-based education against traditional models of schooling is the algorithmic-generative paradigm comparison (See Table 7). While it focuses on outdoor or experiential education, like Stevenson's gap, it is applicable to the broader field of place-based education.

This algorithmic-generative paradigm comparison explores the differences between the "hierarchical, scientific, technological and mass production elements" (Loynes, 2002, p. 6) of the traditional industrial model of education, with a political-minded, emancipatory model – where prescribed outcomes are de-emphasized and students have more autonomy in determining their own learning experiences and trajectories (Loynes, 2002; Ringer, 1999).

According to Loynes (2002), the algorithmic paradigm can be recognized by the words commonly associated with it, such as: "programming, processing, framing, funneling, front loading, sequencing, cycles, outcomes, task, leader and team. It can also be recognized by the beliefs that are taken as axiomatic" (p. 6). The *generative paradigm* provides an alternative approach that focuses on decentralization, student agency, and emergent learning:

> [Learning] becomes a journey of discovery of a personal ontology and epistemology for the participant. It incorporates actions based on the experiences inspired by learners choosing for themselves how to make a difference. The individual moves through the role of participant and narrator, and becomes an agent in their world (p. 10).

Loynes (2002) argues that the algorithmic paradigm is concerned with dominance, commodification, and control, while the generative paradigm emphasizes empowerment and seeks to provide opportunities for personal and community-based

transformation. In his words, the generative approach embodies a worldview based on "… a possibility for the future and not one of the established but increasingly unsupportable past" (2002, p. 12), where people critically act within their own communities and value the solutions that emerge from the diversity of perspectives. He also points to an ethos of transparency embedded in the generative paradigm where core values, such as sustainability and justice are made explicit and their meanings openly negotiated and critiqued. He compares this to the agendas embedded in the algorithmic paradigm, which are often "hidden and uncriticized" (p. 12).

Beames' Dimensions of Place-based Learning.

As part of his research on experiential learning, Beames (2006) developed a model for planning and assessing place-based learning experiences (see Figure 1). The model, which is informed by Lyones' exploration of the algorithmic and generative paradigms, presents three dimensions that come together to form instantiations of place-based practices and learning environments.

The first dimension, *Ready-made Sessions – Journeys*, ". . .explores the extent to which outdoor education programs use self-sufficient journeys as a means to learn about self, others, and place" (p. 9). One end of the continuum reflects ready-made or scripted sessions that are compartmentalized and organized around pre-determined outcomes. This approach rests within the algorithmic paradigm. The other end of the continuum represents self-organized journeys that provide space for integrated, sustained, and emergent learning opportunities that are conscious of and respond to students' needs and interests (Beames, 2006; Beames, Atencio, & Ross, 2009).

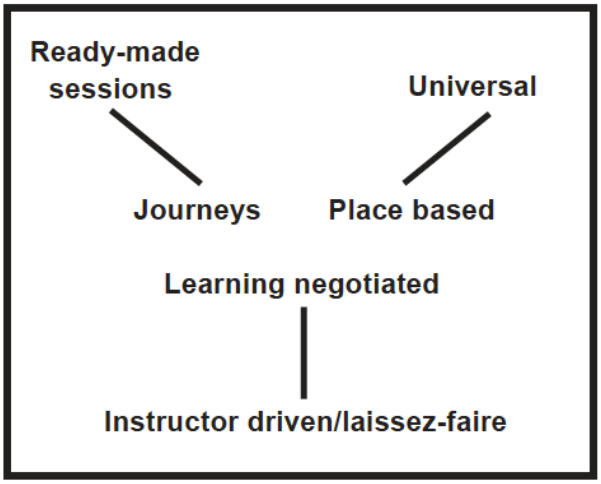


Figure 1. Beames' (2006) Dimensions of Place-based / Outdoor Education.

The second dimension, *Universal – Place-based*, examines the degree to which learning experiences are grounded in the particularities of place. One end represents activities that can happen in "Anywoods, USA" (Baker, 2005), while the other end represents activities and experiences that are rooted in the unique history, ecology, culture, and stories of the local place (p. 9).

The third dimension, *Instructor-driven - Laissez-faire*, focuses on the degree to which participants are able to negotiate what they want to learn and how they want to learn it:

> Teachers on the inner part of this dimension are those who are not overly authoritarian or prescriptive in their approach. Although uncertainty can be challenging for teachers and pupils alike, this more 'generative' approach, where knowledge is co-constructed by the learner and facilitator together, may be most able to cater to the needs and interests of individual students (Beames, Atencio, & Ross, 2009, p. 34).

This last point is important because it draws attention to issues of power and

agency in relation to the role teachers play in guiding students' learning. In Beames' words:

> Educators in the centre of this model are different from manipulative instructors who hold all the power, and different from instructors who think they are being "experiential" by not getting involved at all (the laissez-faire approach) (Beames, 2006, p. 10).

The differences highlighted in these models do not simply represent degrees of difference between place-based and traditional education – they highlight major paradigmatic gaps between traditional education and education that is "place conscious" in the vein proposed by Gruenewald (2003) and Giroux (1988). It is not surprising then, that when place-based learning is implemented it tends to shed some of its key components, particularly those associated with integrated curricula, student-centered learning, emergent inquiries, and authentic outcomes. In these instances, while local places provide content and context for learning, beliefs about knowledge, teaching, and learning do not shift (Smith, 2007; Stevenson 1987/2007).

Place-based education and No Child Left Behind

> When standards are set far from schools, the curriculum becomes decontextualized by design. Connections to local communities and a sense of caring for place are lost, and alternative cultural attitudes toward nature that are more ecologically responsive are marginalized (Graham, 2007, p. 377).

One argument for place-based education's lack of widespread traction is that it has been overshadowed, and as a result devalued, by other reform efforts (Jennings, Swidler, & Koliba, 2005). Many recent reform initiatives and debates have been dominated by the discourse surrounding national standards and high stakes testing, both of which de-emphasize local contexts. According to Gruenewald (2008):

> Contemporary school reform takes little notice of place. The emphasis on state-mandated standards for teachers and students tends to work toward uniform, if sometimes segregated, skills and outcomes that schools are expected to promote. The pressure of "accountability" and the publication of standardized test scores in the news media reinforce the assumption that student, teacher, and school achievement can be measured by classroom routines alone and that the only kind of achievement that really matters is individualistic, quantifiable, and statistically comparable. Such an assumption is misleading because it distracts attention from the larger cultural contexts of living, of which formal education is just a part (p. 620).

As a result of encouraging teachers to organize teaching around content that is being tested, the new standards often put added pressure on an already crowded curriculum. In turn, this further reifies traditional modes of instruction. As a result, policies such as No Child Left Behind make it more difficult to implement strategies that engage students in sustained projects, regardless of whether they are place-based or not. Ironically, while No Child Left Behind places added pressure on local schools to prove their worth, they provide limited flexibility for these same schools to develop models of assessment that are rooted in place.

Gruenewald (2005) sees place-based education as an educational philosophy that provides opportunities for resisting these “placeless” reform efforts. In order to leverage this potential, however, he argues that place-based learning needs be seen as more than a methodology:

> I view place-based education as the discourse with more potential to impact on the future of schooling on a broad scale. However, in order to avoid the common assumption that place-based education is merely a methodology or a technique through which to deliver the standard school curriculum I prefer the term ‘place-conscious education’ to refer to a philosophical orientation that embraces place as a construct fundamental to the purpose, process and structure of schooling (p.262).

Despite these challenges there are many successful instantiations of place-based education, including entire schools dedicated to this approach. While looking at these examples for inspiration and as possible models to emulate, it is important to consider, as well as counter the deeper "grammar of schooling" that makes it difficult to implement place-based education. According to Smith (2007):

> The challenge lies in finding ways to alter the regularities that constrain the introduction of teaching and learning approaches that could contribute to the potentially revolutionary shifts in cultural beliefs and practices that may be required if the goals of social justice and ecological sustainability that inspired the early proponents of environmental education are to be realized (Smith, 2007, p.190).

Gruenewald & Smith (2008) position place-based education as a pedagogy that, at its heart, seeks to counter the traditional goals of education:

> Today, the seldom questioned, underlying assumption about the purpose of schooling is to prepare the next generation to compete and succeed in the global economy. In many respects, public education has become the business of training children and youth to enter the global marketplace as consumers and workers (Greunewald & Smith, p. xiv).

Instead of developing learning goals around a narrative of global competiveness, place-based education emphasizes the importance of preparing students for playing a role in revitalizing and sustaining local cultural and ecological systems. It uses the local as the primary entry point for understanding national and international trends and issues, and their effect on local systems (and vice versa) – the educational version of *think globally, act locally*.

Getting started with place-based education

Smith (2007) suggests that research and frameworks aimed at helping educators develop and implement place-based educational interventions should take a pragmatic

position on the challenges mentioned above. A first step is developing an understanding of the particular context in which the intervention is being enacted. For example, in some cases, simply getting students out of the school building can present unique challenges, and therefore might represent a reasonable first step. Additionally, from a professional development perspective it is important to recognize that teachers have different capacities for and interest in implementing changes in their practices (Smith, 2007).

The Place-Based Education Evaluation Collaborative (2003) encourages educators interested in place-based education to distinguish between short, intermediate, and long-term goals. For example, schools might initially develop some community partnerships and increase the amount of time they spend in the community based on a single intervention. As they build their understanding of place-based education – from both a theoretical and practice perspective – educators and schools can build on these initial experiences, while also expanding their community networks and deepening their relationships with key community partners.

Along these same lines, the Rural School and Community Trust has developed a framework to help districts, schools, programs, and teachers set, document and assess the quality and depth of their place-based educational interventions (Williams, 2003). The framework provides criteria to help assess project- and program-level goals across three core components: Student learning and contributions, Community learning and empowerment, and Deepening and spreading place-based learning (See Table 7 for a general overview of the model).

This framework can be used to plan and assess place-based education from different scales and perspectives. For example, it looks at the individual and classroom level, while also including the school- and community-wide impact and effectiveness of place-based projects, courses, curriculums, or schools. While the framework does not explicitly propose a critical pedagogy of place, there is room for this to emerge based on local needs, interests, and perspectives. One strength of this model is that it emphasizes a comprehensive approach towards implementing place-based education and acknowledges that deeper learning will only occur if place-based education becomes a core value of the school (and the community) and is implemented systemically.

While these frameworks provide macro level direction for implementing and assessing place-based education, they don't provide detailed guidance and precision related to smaller level methods and strategies. One area of research and practice that aligns with and amplifies some of the key aspects of place-based education is design-based education. This approach is also relevant in that it fills in some of the gaps that produce challenges for teachers – particularly regarding instructional methods and systems for engaging students in open-ended inquiry and design.

Table 7. Core categories for assessing place-based learning

Student Learning and Contributions	Student Intellectual Growth	• Promotes deep learning about important content. • Promotes student ownership and control.
	Academic Rigor	• Engages students in investigation, inquiry, and problem solving. • Establishes clear and challenging learning goals. • Enhances student learning through materials, resources, and support.
	Authenticity	• Addresses a real community need or interest. • Helps students take on community roles. • Engages students in real work that produces results. • Develops students' appreciation and understanding of place.

	Assessment	• Involves all participants in assessing learning. • Relies on multiple sources of information to assess learning. • Uses the results of assessment to facilitate learning.
Community Learning and Empowerment	Connections Between Schools and Community	• Builds school-community connections. • Addresses a community problem, issue, or interest. • Honors the local culture.
	Process and Power	• Welcomes and questions complications that arise from the work. • Builds access, communication, and trust.
	Roles and Relationships	• Supports adults to take on new roles. • Cultivates new leadership. • Nurtures new relationships. • Promotes shared responsibility and accountability.
	Community Learning	• Leads to new community understandings • Engages adults in learning • Fosters a culture for learning
Deepening and Spreading Place-based Learning	Instructional Spread	• Impacts curriculum • Impacts teachers and teaching • Helps students stretch themselves as learners, problem solvers, and leaders
	Community Engagement	• Involves a variety of individuals and organizations. • Leads to increasing impact in the community.
	Supporting Structures	• Is supported by teacher development and planning. • Is advanced by school policies and practices. • Influences community policies and structures. • Broadens schools role within community.
	New Resources and Connections	• Attracts and creates new resources. • Spreads to new places.
Source: Williams, D.T. (2003). *The place-based learning portfolio.* Washington, DC: Rural School and Community Trust.		

Design-based Education

While many place-based curricula and projects have a design component, the field as a whole has not thoroughly articulated detailed strategies for scaffolding students' work in this area. As a result, while some educators may be interested in engaging students in identifying and designing solutions to open-ended problems, they may not have models to guide them through implementing this approach. One consequence of this disconnect is that teachers sometimes use the local context as a starting point for their students' learning, but do so using a teacher-directed approach where students have limited autonomy over their work and remain consumers of

information – thereby ignoring some of the deeper philosophical and pedagogical components of place-based education (Smith, 2007; Stevenson, 1987/2007).

Because of this challenge it is useful to combine the core values and goals of place-based education with other educational pedagogies in a way that addresses particular needs and goals. One area of research and practice that holds particular promise in this regard is design-based education.

What is design-based education?

For the purposes of this dissertation, I am using *design-based education* to reference a broad cluster of "design-centric" approaches common in fields such as engineering, science, art, media design, and architecture that foreground learning through design (Fortus, Dershimer, Krajcik, Marx, & Mamlok‐Naaman, 2004; Gomez-Puente, van Eijck , & Jochems, 2012; Kolodner et al. 2003; Kafai, 1995; Marshalek, 1995; Silk, Schunn & Strand Cary, 2009)[2]. While different domains have unique theoretical and practice-based traditions related to design and design-based education, a unifying feature of this approach is that it structures learning around planning, developing and evaluating systems and material artifacts (Davis, Hawley, McMullan, & Spilka, 1997).

In a K-12 educational context, design-based education is often used to develop students' understanding of domain-specific concepts, skills, and practices, as well as their capacity for more generally utilizing formal design processes and methods (Davis,

[2] I chose to use a broad definition of design-based education as a way to help me identify commonalities across different design-centric approaches – particularly those that are most salient to the two interventions included in this study and subsequently, the core values, goals, and methods associated with Place-based Design.

et al., 1997). Han and Bhattacharya (2001) suggest that design-based education "values both the process of learning and its outcomes or products" (p. 6). Examples of this approach include students developing their conceptual understanding of energy by building windmills or solar racing cars, or their understanding of circuitry or engineering by designing robots. In this context, Vattam & Kolodner (2008) suggest that a design-based pedagogy should present students with design challenges that require them to use targeted content and conceptual understanding (in their case related to science) to plan and build working artifacts:

> While attempting to understand the design challenge, and perhaps during first attempts to achieve the challenge, students identify the science content they need to apply for success, and they move between learning that content and applying it to achieve the design challenge. . . as students iteratively move toward better design solutions, they iteratively move toward better understandings of science concepts and laws, generalizing from the particular experiences they are having as they design (Vattam & Kolodner, 2008, pp. 407-408).

Design-based education also includes cases where students construct artifacts to teach others about particular concepts (Kafai, 1995). Examples of this approach include students designing math-focused educational video games for their peers to play (Kafai, 1995; Burn, 2009) or students designing school-based museum exhibits (D'Acquisto, 2006). In addition to (or sometimes as part of) engaging students in their own design work, design-based education often includes an inquiry component where students reflect on and critique objects or environments designed by others, as well as the context in which they are designed and used (Davis, et al., 1997; Marschalek, 1995). Examples of this include students reflecting on the design of their school in relation to their personal learning experiences, or students documenting and critiquing

the design of a local neighborhood in relation to new urbanism, public safety, or access to healthy food (Dennis, 2013).

A natural extension of this approach, within the context of design-based education, involves engaging students in the design of artifacts and experiences for the broader community. Examples of this approach include students studying health problems related to low level ozone, then developing a plan to reduce emissions near their school (Smith & Sobel, 2010), students studying energy conservation, then developing and implementing a plan to reduce energy consumption at their school; and students mapping green spaces in their neighborhood, then helping to design a local park (Dennis, 2013).

Design-based education is often associated with constructionism, a theory of learning and an educational approach rooted in the belief that new knowledge is constructed through the ongoing (re-)creation of external artifacts (Harel, 1991; Kafai & Resnick, 1996; Papert, 1980; Papert & Harel, 1991). This does not mean that learners cannot build new knowledge without designing artifacts, rather that doing so produces particularly effective opportunities for learning. According to Papert (1991):

> Constructionism – the N word as opposed to the V word – shares constructivism's connotation of learning as ‘building knowledge structures’ irrespective of the circumstances of the learning. It then adds the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe (Papert, 1991, p.1).

The “public entities” or artifacts students build as part of the design process “can be shown, discussed, examined, probed, and admired” (Papert, 1993, p. 142). According to Seitamaa-Hakkarainen, Kangas, Raunio, & Hakkarainen (2012) it is

through this process of externalization and collaboration around design representations "where the first vague design ideas are transformed into further articulated and more determined ideas, to the explicit design alternatives, and finally, externalized and objectified as materially embodied design artifacts" (p. 56). It is also through interacting with these objects – sharing, testing, and iteratively redesigning them – within a personally meaningful and socially relevant context, where old and new knowledge is connected and reconfigured and new understandings of the world are produced (Papert & Harel, 1991). This approach, which positions students as active agents – capable of creating new knowledge – differs significantly from traditional schooling, where the emphasis is on dissemination and teachers are expected to deliver a pre-determined, and fixed body of knowledge that is didactically received or "consumed" by students (Tyack & Cuban, 1995).

In his book *Mindstorms: Children, Computers, and Powerful Ideas* (1980), Papert introduces the contructionist model by describing how gears served as artifacts, or "objects-to-think-with," as he explored his interest in and developed his understanding of mathematics:

> First, they were part of my natural 'landscape,' embedded in the culture around me. This made it possible for me to find them myself and relate to them in my own fashion. Second, gears were part of the world of adults around me and through them I could relate to these people. Third, I could use my body to think about the gears. I could feel how gears turn by imagining my body turning. This made it possible for me to draw on my 'body knowledge' to think about gear systems. And finally, because, in a very real sense, the relationship between gears contains a great deal of mathematical information, I could use the gears to think about formal systems (p.11).

Similarly, Koehler and Mishra (2005) highlight the interplay that exists between designed artifacts, available tools, and students' conceptual understanding:

> The act of design is essentially a dialogue between ideas and the world, theories and their application, concepts and their realization, tools and goals. This dialogue lies at the heart of true inquiry, involving as it does the construction of meaning and the evolution of understanding through a dialogic, transactional process (p.95).

While design-based education is rooted in constructionism, there is variation in the degree to which, and the methods through which, different design-based approaches mediate and scaffold students' design work and related learning. Some approaches focus on designing learning environments and tools that facilitate personally motivated and self-directed design experiences. Examples include informal learning environments such as the Computer Clubhouse (Kafai, Peppler, & Chapman, 2009), YOUMedia (Austin, Ehrlich, Puckett, & Singleton, 2011), as well as learning activities mediated by specific digital tools and platforms such as Gamestar Mechanic (Games & Squire, 2008); LEGO/Logo (Resnick, & Ocko, 1991), and Scratch (Maloney, Resnick, Rusk, Silverman, & Eastmond, 2010).

Other models of design-based education, particularly in school settings, begin with targeted learning goals and include more constraints and direction related to content, design processes, and sequencing. This is especially the case when the goal is to align students' design activities with the development of particular skills and conceptual understandings. Examples of this approach include design-oriented instantiations of problem-based learning (Kolodner, Gray, & Fasse, 2003), as well as, specific curricular models such as Design-Based Science (DBS) (Fortus et al. 2004), Learning-by-Design (LBD) (Kolodner, et al, 2003), and Learning-by-Collaborative-Design (Seitamaa-Hakkarainen, Kangas, Raunio, & Hakkarainen, 2012).

Design-based education as problem solving

Design-based education is often framed as a form of problem solving, whereby design concepts and practices are used to define and develop solutions to ill-defined problems (Gomez-Puente, van Eijck , & Jochems, 2012). According to Doppelt, Mehalik, Schunn, Silk, & Krysinski (2008):

> The design process [in design-based education] is parallel to solving problems and has a general structure which typically includes stages such as: defining the problem and identifying the need, collecting information, introducing alternative solutions, choosing the optimal solution, designing and constructing a prototype, and evaluation (p.24).

Citing Simon (1999), Fortus et al. (2004) draw similarities between design and other "real world" problem solving tasks:

> Design is a particular, but representative, instance of real-world problem-solving, having no prescribed path leading from the requirement specification to the final design product (Bucciarelli, 1994). Often there is no clear definition of when an acceptable solution has been reached. Seldom can one determine if a design product is the best response to the requirements (pp. 1082-1083).

Lawson and Dorst (2009) agree that *pose-search-generate-test* is a common feature of learning through design (p. 30). They add, however, that this perspective only captures a portion of the activities involved in the design process. Instead, they suggest that a problem-solving model applies more to technically-oriented contexts such as engineering, as well as certain moments in the design process – for example, toward the end of the process when goals have become more explicit, clear, and stable (Dorst, p. 32).

Solving open-ended, and ill-defined design challenges requires learners to integrate and successfully employ a range of skills and activities, while also modifying

and synthesizing their understanding of the design challenge, the underlying concepts at play, and possible solutions. Puntambekar and Kolodner (2005), who helped develop Learning by Design, a design-based approach for learning science, highlight both the complexity involved in the design, and the need to support students through the process:

> Students need support to execute the various activities involved in designing successfully, such as analyzing the situation to understand the problems and issues that need to be addressed, gathering information, generating alternative solutions, generating criteria to evaluate solutions, thinking about trade-offs, and justifying choices. Additional complexity comes from design's cyclical nature; designing is not a linear process, but rather the solution is often 'emergent,' coming from a complex interplay between refining one's understanding of the design challenge and in parallel refining one's solution ideas (p.186).

Given this degree of complexity, it is not surprising that much of the research and practice surrounding design-based education focuses on developing tools, strategies, and systems for scaffolding both the design process and students' learning. One of the affordances of formalizing this process is that it distinguishes between design as an everyday activity and design as a formal way of thinking about and solving problems. According to Fortus, et al. (2004):

> The distinction between the two lies in their differing degrees of formalization: while everyday design is often spontaneous and intuitive, with the designer unaware that she is engaged in a problem-solving process that could perhaps be improved upon, Design is a formal process, and may include many explicit stages and criteria for determining whether the outcomes of the design process are acceptable. Everyday designers often err in their decisions and considerations; the formal Design process attempts to minimize the chances that Designers will do so as well (Fortus et al., 2004, p.1082).

This is an important point because in some learning contexts students are given problems or design tasks without sufficient guidance or scaffolding to help them

complete the challenge (Kolodner & Gray, 2002). One common goal of design-based education is avoiding this situation by helping students use formalized design processes to explore and solve design problems. As such, a core belief embedded in design-based education is that these processes can and should be taught (Schön, 1983).

Key components of design-based education

In this section I briefly highlight some of the key components associated with design-based education. It is important to note, however, that while they represent common components, there is variation in how they are conceptualized and implemented across instantiations of design-based education. Additionally, while there are other aspects of design-based education that could be included here, I chose to present the components that were most salient to developing the designed cases included in this study, and subsequently, Place-based Design.

Authentic goals and practices.

Many models of design-based education emphasize the importance of "real world" design goals, whereby students solve design challenges involving authentic problems, materials, tasks, tools, language, and practices. Authentic goals provide the context for engaging in design and provide the seed from which sub-goals, questions, content, and learning activities emerge and evolve (Lee & Kolodner, 2011; Savery & Duffy, 1996). The material and social aspects of the learning environment, in turn are designed to support students as they work to identify, modify, and achieve their design goals. Lee & Kolodner (2011) highlight how the dynamic nature of design-based learning environments supports the evolution of initial goals, as well as the emergence of new goals:

> Once someone has a goal, the physical, social and emotional environment they are engaging in will suggest and motivate generation of new goals and sub-goals. As people generate, evaluate, and refine alternative solutions to challenges they aim to achieve, they identify knowledge and skills they need to learn, setting up new goals for themselves. (Lee & Kolodner, 2011, p.6).

The research and practices associated with problem-based learning are relevant in this context, in that many of the same criteria can be applied when developing authentic design-based experiences. In his literature review of problem-based learning, Savery (2009) found the following guidelines for developing authentic problems:

1. The problem should be grounded in the knowledge and skills mandated by the curriculum.
2. The problem should engage the learners in a significant aspect of the content within the discipline and/or across disciplines or domains of knowledge.
3. The problem should be authentic, contemporary and relevant.
4. The problem should require learners to utilize the same knowledge, skills, and attitudes as would be required in a real-world setting.
5. The problem should be complex enough and large enough to challenge the learners and require contributions from all members of the team.
6. The problem should be ill-structured with missing or contradictory information.
7. Provide instructional materials related to the development of anticipated skills along with the preliminary content materials at the start of the problem activity. Learners will note the existence of the materials and return to them when they have a need and purpose for learning the skill (p. 153).

Centrality of artifacts.

As discussed earlier, the creation of artifacts is a central component of the

interactions that occur as part of design-based education. According to Seitamaa-Hakkarainen, Kangas, Raunio, & Hakkarainen (2012), “designing cannot be reduced to merely playing with ideas; in order to understand and improve the ideas in question, they have to be given a material form by means of practical exploration, drawing, prototyping, and manufacturing” (p. 56). In turn, it is through sharing and discussing these representations that “design ideas, proposed solutions, and decisions are made verbally and visually explicit and visible” (p. 56).

Because the design process is iterative, “materializing and sharing” applies to both the final manifestation of their design, as well as drawings, models, images, textual descriptions, etc. developed and used throughout the design process. In addition to developing their conceptual understanding of the content and concepts embedded in their design, this process helps students develop the ability to produce and manage representations of their abstract ideas, as well as strategies and skills for communicating these to others (Lawson & Dorst, 2009).

Perry and Anderson (1998) divide artifacts into two categories: *design artifacts*, such as sketches, mock-ups, prototypes and models; and *procedural artifacts*, such as protocols, calendars and critique guidelines. In their model, “[d]esign artifacts represent thought about a design, whereas procedural artifacts convey the anticipated design process and help to orient people to it” (p. 275). Building on Papert’s (1993) concept of objects-to-think-with, they frame design artifacts as “objects of interaction,” and highlight their critical role as resources for communication:

> Objects can be pointed to, talked about or sketched on. Artifacts also become the terrain on which conflicts and collaboration occur. Agreements are reified in artifacts. Design artifacts can function as mediators between different individuals or groups in design. . .The communication dimension and the role and

> transformation of artifacts in design work intersect in that the artifacts are subject to discussion, negotiation, and alteration. They are the foci of much of the social interaction, as contested symbols, objectifications of temporary agreements, and symbolic representations of potential productions (Perry, & Sanderson,1998, pp. 275-276).

Ritualized activity structures: Design processes.

While we design things informally on a daily basis, a critical component of design-based education is developing students' understanding of, and capacity for employing *formal* design processes. One benefit of formalizing the design process is that it provides students with strategies they can use to frame, manage, and solve design problems. According to Kolko (2010): "Without tacit understanding of design process, the designer has no formal manner of engaging in a problem – no way of understanding the problem, or adding constraints in order to better frame and shape the problem into something that is manageable" (para. 3).

In his review of commonly used design processes, Waloszek (2012) identifies the following "prototypical design stages": understand the problem, observe, interpret the results, generate ideas, prototype/ experiment, and test/ implement/ improve. Similarly, Davis et al. (1997) suggest that design-based education engages learners in the following stages: identify and define problems, gather and analyze information, determine criteria for successful solutions, generate alternative solutions and build prototypes, evaluate and select appropriate solutions, implement choices, and evaluate outcomes (Davis, et al., 1997, p.3).

Despite these prototypical stages, the specific process(-es) used to solve design challenges and engage students in design-based learning is dependent on several factors, including: the curricular goals, the nature of the design problem, and domain

specific traditions and practices. Given this range of design approaches, one challenge facing educators is making sure they don't wrongly communicate to students that there is a single, fixed process for solving design problems.

Reflection.

A key component of the design process is reflection. Reflecting on their design work helps learners develop their understanding of both the design process they are using, and key concepts embedded in the artifacts they are building (Lee and Kolodner (2011). Puntambekar and Kolodner (2004) stress the importance of providing sufficient time for reflection throughout the design process, so that students can more easily make connections between their "hands on" activities and their understanding of underlying concepts:

> It is important that they see the links between testing their models and the science concepts that are involved in making their models work (or not work). In other word their 'doing' and their 'thinking' about the models they are building needs to be integrated. Very often, it becomes difficult to interrupt their 'hands-on' activities unless sufficient time is allocated for discussions. Time for reflection and whole class discussions frequently during the unit needs to be built into the units. Reflection needs to be at the individual, small group and whole class levels (Puntambekar, S., & Kolodner p. 5).

To capture the integrative nature of "doing" and "thinking," Stables & Kimbell, (2007) (see Figure 2) developed a model of learning through design that highlights the interplay between the material aspects of students' designs, reflection, and their evolving mental models. By focusing on "thought in action," the model suggests a difference between reflecting *in the process of doing* and reflecting *after doing* (Davis, et al., 1997). This distinction is similar to the one Schön (1983) makes between *reflection in action* and *reflection on action*. The former refers to reflection "in the midst of action"

or “action present” and involves the designer fluidly reflecting on or reacting to a challenge or need without pausing to inquire into the situation (p. 125). Reflection on action, however, involves looking back on an experience, behavior, or decision with the intention of understanding and naming the reasons behind the action, and the relationship between the action and successful and unsuccessful consequences:

> [Reflection-on-action] is a process of getting in touch with the understandings we form spontaneously in the midst of action. It is central to the work of criticism, coaching, learning, and teaching. A good dance teacher, for example, may ask herself, as she tries to describe a new move to her student, ‘What do I really do at this point?’ In order to answer such a question, she must observe herself in the doing, and in order to communicate what she discovers, she must describe it; there is an art of description distinct from the art that may be involved in the action described (p. 126).

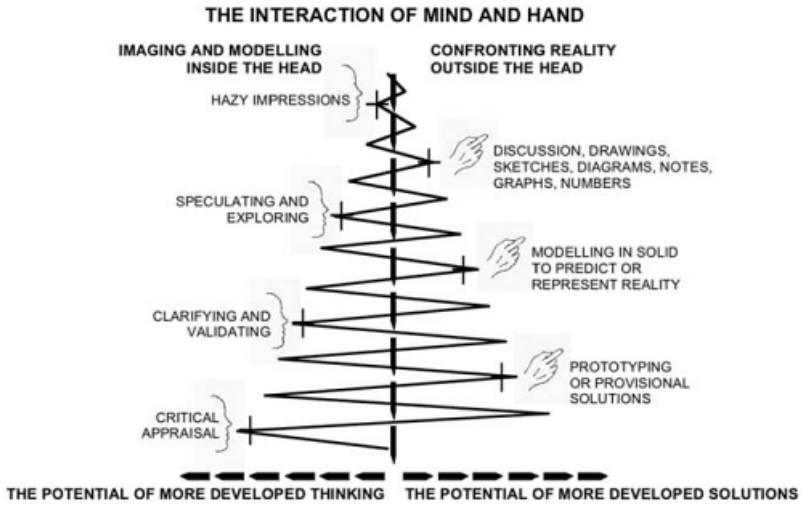


Figure 2. The interaction of mind and hand (Stables & Kimbell, 2007).

Schön’s (1983) distinction between different types of reflection is important in that it reminds us that students may make design decisions without being conscious of the reasons behind them. As a result, scaffolding students’ reflection-on-action and encouraging them to explain their reasoning is a critical component of design-based

education, because it helps them identify and reflect on any breakdowns that occur between their conceptions and their designs, and guides them toward meeting proposed design solutions (Koehler & Mishra, 2005; Schön, 1983).

In order to support students' reflective practices, it is also useful to look more broadly at the role reflection plays in other learning contexts. For example, as part of their work on experiential education Lindsey and Berger (2009) suggest the following elements for structuring reflective practices in classroom settings:

1. The teacher should serve as a facilitator and prompt reflection by challenging learners' assumptions.
2. Build community before and during reflective experiences, so that learners feel safe engaging in critical reflection.
3. Make the reflection process transparent and build it around questions that move learners' from descriptive, superficial reflection to more critical reflection using questions such as: What happened? Why did it happen? What have I learned? How would I apply this learning to future experiences? (Lindsey and Berger, 2009, pp. 128-129).

Iterative design cycles.

Another central component of the design process that cuts across various instantiations of design-based education is the centrality of iterative design, whereby learners adjust their designs and conceptual understanding across a series of trials or design cycles. According to Puntembekar & Kolodner (2004), cycles of design, evaluation, and redesign are important because they challenge students to reconcile their results – both anticipated and actual – with their understanding of the concepts

underlying the inquiry. While their work focuses on science it can be translated to other subject areas:

> Our understanding of the cognition of learning from design activities tells us that students need to go through several cycles of trial, analysis, and refinement to develop a deep understanding of science. Each cycle allows them to apply what they know about a scientific principle that they are learning, test the application, analyze the results and the conceptions that led them to their design, and refine their conceptions so as to be able to come up with a better solution (Puntambekar & Kolodner, 2004, p.2)

A key component of iteration is developing heuristics (e.g., rules of thumb) and practices to guide students' thinking. Lee & Kolodner (2011), for example, highlight the importance of asking "a variety of questions about [potential] alternatives, in the process deriving new criteria and constraints, elaborating and reformulating proposed solutions, and generating new alternatives and new evaluation criteria from those already proposed" (p. 5). They propose four types of questions students can use to guide them through this process: (1) function-directed questions (the degree to which a function is met); (2) derivation-driven questions (questions derived from prior design-solution-reformulations); (3) outcome-related questions (use of prior outcomes to predict current outcomes – "what-if" alternatives); and (4) constraint-related questions (the degree to which the proposed solution fits) (p. 5). While these questions may apply to many contexts it is important to remember that the specific methods used to guide and encourage iteration may vary based on a variety of factors, including the subject area, learning goals, and students' prior design experiences.

Ritualized activity structures: Methods.

These are the formal techniques, strategies, or rules of thumb students learn and use as part of their design work. As with the design process, there is not a single set of

methods associated with design-based education (Lee and Kolodner, 2011). For example, while ideation or brainstorming is often a central component of the design process, the specific methods or activities one chooses to employ for this purpose varies across approaches. Similarly, the methods used during the inquiry phase may employ different strategies based on the unique nature of the design problem and context. Different design processes also have particular methods associated with them. User-centered design, for example may use scenarios or use-cases, while many science- and engineering-centric approaches draw from experimental methods common to science.

When implementing design-based educational approaches it is important to recognize that it can be challenging for students to learn new design process and/or new design methods they are unfamiliar with. This is compounded when students are simultaneously expected to engage with complex, and often new, content and domain specific concepts (Kolodner & Gray, 2002). As a result, Kolodner and Gray (2002) emphasize the importance of developing students' knowledge and practice around ritualized design activities, so that overtime the design practices become second nature, allowing students and teachers to focus greater attention on content and conceptual understanding:

> As [learners] gain comfort with the discourse structures, they become better able to concentrate on the content of what they are discussing and reasoning about. The repeated discourse structures of problem-based learning become 'ritualized' activity structures for students . . . activities that are carried out repeatedly taking different content into account (Kolodner & Gray, 2002, p.221).

Situated and holistic.

While the components discussed above are separated here for the purpose of

describing them, it is critical to remember that they are enacted as part of a coherent whole. Schön (1983, as summarized in Amerego & Fowler, 2005, p. 3) emphasizes the active, situated, and integrative nature of design and argues the following points about teaching design:

1. *Design is learnable, but not didactically or discursively teachable* – it can be learned only in and through practical operations.
2. *Design is holistic* – its parts cannot be learned in isolation. It must be learned as a whole because all components of a situation have meaning.
3. *Design depends upon the ability to recognize desirable and undesirable qualities of the discovered world* – but novice students do not possess this ability, and it cannot be conveyed to them by verbal descriptions, *only* in the operational context of the task (as summarized in Amerego & Fowler, 2005, p. 3).

In alignment with these points, Lawson and Durst (2009, p.99) apply Dreyfus' "generic model of expertise" to devise a framework for tracking the development of students' design expertise. Their framework is intended as a tool to identify students' progress through different layers of expertise related to design. Each layer represents a particular mode of thinking and doing. As they move from being novices to experts students display unique ways of problem solving, unique ways of abstracting ideas (in analysis and synthesis), and unique ways of reflecting. Novices, for example, rely heavily on rule-based and convention-based thinking, while experts have the ability to use strategy- and situation-based thinking (Lawson & Dorst, 2009, p. 216).

Waks (2001, p. 47) highlights the central role that teachers play in coaching novice learners as they develop greater fluency with design. He identifies three core coaching strategies or tasks that must come together to support novice designers:

1. Dealing (alongside the novices) with the substantive problems of design, via combinations of moves/ words, demonstrations/ descriptions, in order to convey to novices the ability to deal with similar situations.
2. Particularizing the demonstrations/ descriptions to specific learners – that is, fitting esoteric moves and words into a dialogue with the novices' uncertain moves and words.
3. Maintaining relationships with the novices. These teaching-learning relationships are fraught with problems because the novices can only learn by doing – but as novices they cannot yet actually *do*. The novices thus can be expected to experience feelings of loss of control, vulnerability, and enforced dependence. So coaches must cope with the predictable negative feelings arising in this predicament.

Together these models provide useful starting points for identifying the interactions, experiences and scaffolding students might need in order to develop their expertise as designers. It is not sufficient, for example, to integrate a few design activities into a traditional transmission-based curriculum and expect to see growth in students' thinking or practices related to design. Similarly, while it might be appropriate at times, it is not sufficient to only provide students with design activities that are highly structured, and include clear or pre-determined design solutions. Instead, students need

opportunities (along with appropriate support) to engage in meaningful, ill-defined design activities across multiple contexts.

Design as a universal educational approach

While design-based education has traditionally been integral to specific subject areas within K-12 education (e.g., art, science, and industrial design), it has also been forwarded as an approach that should be integrated throughout the curriculum (Carroll, et al., 2010; Davis et al., 1997). While the rationale for this perspective differs across contexts, a common refrain is that design-based education provides an avenue for bridging the gap that exists between what students currently learn in school and what they need to know and be able to do (and design) as workers, life-long learners, and citizens (Davis et al., 1997; Games & Squire, 2008).

While this view is partially rooted in debates surrounding how to best prepare students for the demands of the knowledge economy, it is also stems from a belief that the increasing complexity and uniqueness of the challenges facing our world in the 21st Century will require new levels of innovation and creativity, as well as a greater capacity for systems thinking and multi-disciplinary problem solving (Lee and Kolodner, 2011) . Davis, et al. (1997) attribute these concerns and challenges with the need for new educational approaches, including design-based education:

> A variety of economic, environmental and social imperatives fuel the international adoption of design-based strategies. In industrial and developing nations alike, public and private sector leaders recognize that young people must graduate from compulsory education systems with strong, flexible skills if they are to compete successfully for jobs in the global marketplace. The answer seems to lie in giving priority to activities that build up students' practical capability in tackling realistically complex problems with social and human dimensions. Burgeoning populations, finite natural resources, and unsustainable patterns of consumption, manufacturing, building, and transportation are wake-up calls to educators to revisit the underlying assumptions of school curricula (Davis, et al., 1997, p. 10).

In part, the call for amplifying the role that design and design-based learning play in school curricula is based on the premise that designers approach problems in unique ways and have unique ways of thinking about and acting in the world (Schön, 1983; Cross 2007). As a result of his research on designers and design practices, Cross (2007) argues that design requires distinct "things to know, ways of knowing them, and ways of finding out about them" – i.e., "designerly ways of knowing" (Cross, 2007, p. 17). Advocates of design-based education build on this premise – arguing that design experiences not only help students develop the skills, methods, processes and practices associated with design, but also fosters their "designer mindset" or disposition as designers (Games & Squire, 2008). According to The Henry Ford Learning Institute (n.d.):

> Using one's imagination is central to the practices of design thinking as students learn techniques for acquiring inspiration, developing insights, and ideating possible solutions. Through the design thinking process, students learn to identify, address, and generate solutions to challenges they face in their everyday life experiences and they see the value of successfully implementing these changes to impact their world (pp. 4-5).

IDEO (2011), a leading advocate of applying the theories and practices of design to education, highlights the potential of design to empower students:

> Thinking like a designer can transform the way you approach the world when imagining and creating new solutions for the future: it's about being aware of the world around you, believing that you play a role in shaping that world, and taking action toward a more desirable future (IDEO, 2011, p. 3).

Design and design thinking have also been forwarded as central components of what it means to be literate in the 21st Century. This does not diminish the importance of reading and writing as core literacies, but instead, emphasizes that literacy involves

the active and dynamic *design* of new meanings via the reorganization of available resources (Kress, 2003; New London Group, 1996). From a broad perspective, a literacy rooted in design suggests that students should be capable of collaboratively and creatively designing solutions to complex, open-ended problems. This perspective is useful in that it implies more than simply engaging students in the production of artifacts – it also entails cultivating an ethos built around participation, collaboration and distributed expertise (Lanskshear & Knobel, 2007, Jenkins, Purushotma, Clinton, Weigel, & Robison, 2006), nurturing students' identity(-ies) as designers, and developing their designer mindset (Gee, 2004; Gee, 2007, Games & Squire, 2008).

Developing students' ability to think like designers, however, requires a reworking of traditional approaches towards education. In particular, it requires new forms of teaching and learning, including a shift from the transmission models of instruction that dominate many schools, towards more student-centered pedagogies that allow students to participate in design communities in a way that positions them as producers of knowledge and active designers of their own social futures (New London Group, 1996, Kalantzis & Cope, 2005). This is not an easy change for schools, however, especially since it requires a major epistemological shift. Referencing Schön's work (1995) Games and Squire (2008) argue that: "Adopting a designer perspective entails an epistemological shift by the learner from the teacher-driven transmission view commonly promoted by schools, to a conception of knowledge as a dynamic construct that emerges from a dialog between the designer, the designed and a larger community of design practitioners" (p. 1).

In response to this call, many educators advocate for curricular changes that promote deeper and broader applications of design-based learning in education. In some cases, entire schools have established design as a central component of their pedagogy and curriculum (Davis, et al., 1997). Interestingly, the current trend towards infusing design thinking into education is not specific to students. As design thinking has made its way through the business and design world, it is now being forwarded as a general strategy for improving school practices. Several organizations, labs, and schools have been developing strategies for helping teachers and schools use traditional design approaches to explore and solve issues, as well as produce new innovations (IDEO, 2011)[3]. The hope is that engaging educators in design and design-centric research will help produce changes in how teachers approach their own work and build their capacity for doing similar work with their students.

Democratic Education

> Despite the vast number of changes in the education system in recent years, learners are seldom consulted and remain largely unheard in the change process. If education is to become more personalized, then the views of learners must be heard. However, embedding 'learner voice' is not just about changing outcomes or finding solutions to existing 'issues' but rather it is about changing the very processes, mechanisms and ways in which learners can have a direct influence on their education (Rudd, Colligan, & Naik. 2006, p. 1).

Place-based education is rooted in a belief that students should have a voice in what they learn and how they learn it. It is also rooted in a belief that students' school-based learning experiences should provide opportunities for them to participate in the civic fabric of their community. The values and practices associated with democratic

[3] See for example, the Laboratory on Design Thinking in Education (dLab) at the University of Kentucky; the Nueva School's Innovation Lab (I-Lab) and Design Thinking Program, the K-12 Lab at the dSchool (Stanford's Institute of Design).

education can be used to support and amplify these beliefs and goals. In addition to providing a theoretical background that helps frame the importance of engaging youth in civic action, democratic education provides specific methods for achieving this goal. While it encompasses a set of deeper philosophical and procedural principles, for the purposes of this dissertation study I focus on three key aspects of democratic education: (1) maintaining democratic structures and practices within classrooms; (2) increasing students' choice and voice over their own learning trajectory; and (3) developing students' capacity for and disposition towards perspective recognition.

Overview

Michael Apple & James Beane (2007), leading figures in developing and applying democratic learning principles in K-12 settings, argue that schools should actively promote a "democratic way of life" by integrating the core values and principles of democracy into the fabric of the school. The values and principles they consider central to this approach, include:

1. Concern for the dignity and rights of individuals and minorities.
2. Concern for the welfare of others and the `common good.'
3. Faith in the individual and collective capacity of people to create possibilities for resolving problems.
4. The open flow of ideas, regardless of their popularity, that enables people to be as fully informed as possible.
5. The use of critical reflection and analysis to evaluate ideas, problems, and policies.
6. An understanding that democracy is not so much an ideal to be pursued as an

idealized set of values that we must live and that must guide our life as a people.

7. The organization of social institutions to promote and extend the democratic way of life (Apple & Beane, 2007, pp. 6-7).

Similar to Gruenewald's (2003) call for a *critical* pedagogy of place, some models of democratic education suggest that schools should proactively help "students to understand and to deal reflectively with the contradictions that result from the ideals within American society (such as those made up by the American creed – i.e., liberty, justice, and equality)" (Banks, 2007, pp. 17-18). To support this goal, schools should openly acknowledge these contradictions, and seek opportunities for students' to reflect on how they play out in their own lives and communities – including within their own school. Similarly, schools should help students understand "the ways in which knowledge is constructed and to participate in rethinking, reconceptualizing, and constructing knowledge" (Banks, p.16), so they can become critical consumers and producers of knowledge – both central components of democratic participation.

Student voice

In addition to, or rather in concert with supporting the values and principles that promote the "democratic way of life," Beane (2005) argues that schools should engage students in democratic practices and provide opportunities for them to deliberate, make shared-decisions, solve problems and produce change. This argument rests on two key beliefs: (1) regardless of their age, young people have a right to have a say in what happens in their school; and (2) students can't learn to "live the democratic way" without *engaging in* democratic practices and processes (Beane, 2005, p.2). In addition to shaping the nature of their learning experiences, a "pedagogy of voice" should help

students “explore self and identity, develop self-understanding and self-respect and improve agency, capability and potential” (Ranson, 2000 as cited in Manefield, Collins, Moore, Mahar & Warne, 2007).

When involving student voice in decisions it is important to recognize, and be transparent about, the nature of their involvement. Most democratic education models argue that student voice should extend beyond an advisory role, and be linked with action, choice, and “authentic participation” in decision-making processes – i.e., student voice should not simply be used so that others can make decisions. Students should be involved in decisions that are critical to their learning, including decisions about what and how they learn and how their learning is assessed.

Roger Hart (1992) developed a widely used framework called the *Ladder of Student Involvement in School* to help educators distinguish between different types and degrees of student participation. The lowest rungs represent “non-participation” and include tokenism and manipulation of students to advance pre-determined goals, while the highest rungs include adult-initiated, shared decision making with students and student-initiated, shared decision-making with adults.

This model is useful in helping educators assess their own practices. It also invites discussion about the best ways to help students’ progress from non-participation, towards more autonomy. According to Bragg (2007):

> There is a certain amount of debate about which of the highest rungs should represent the most significant and beneficial achievement. Some analysts stress the importance of dialogue and power sharing between adults and young people, while others emphasize young people’s autonomy. Practical, as well as philosophical, considerations play a role here. For instance, organizations such as schools, with a perpetually changing cohort of young people and a more stable staff, may find the ‘dialogic’ model more effective in instilling long-term changes in adult attitudes and skills, that can be reactivated with successive

> groups of young people. Nonetheless, the model has proved useful to many groups and organizations as a guide in assessing the place of young people in the work they do (p. 24).

In addition to engaging students in making curricular and policy decisions, student voice has more recently been forwarded as a critical component of educational reform. According to Mitra (2004):

> In its present form, student voice activities range from schools gathering information from students through focus groups and surveys to students working alongside teachers to develop and implement strategies for school improvement The existing research suggests that this new form of student voice has served as a catalyst for change in schools, including helping to improve teaching, curriculum, and teacher-student relationships and leading to changes in student assessment and teacher training. Partnering with students to identify school problems and possible solutions reminds teachers and administrators that students possess unique knowledge and perspectives about their schools that adults cannot fully replicate. Through open conversations about injustices in schools, student voice can raise equity issues that tend to get swept under the rug by administrators and other adults in the school who would rather avoid controversy. By involving students and particularly students failing subjects or rarely attending school, school personnel cannot easily shift the blame of failure onto the students. Instead they must assess the problems within the school's structure and culture (pp. 652-653).

Honoring and cultivating student voice has been shown to produce positive results in students, teachers, and schools. Fielding & Rudduck (2002) identify the following benefits to students: (1) a greater sense of membership and belonging, which also leads to more positive feelings about school; (2) a greater sense of self-worth; (3) an increased sense of "self as learner", which improves students' ability to manage their own progress in learning; and (4) an increased sense of agency, whereby students feel they can impact things that matter to them in school (p. 6). In his review of literature in this area, Fletcher (n.d.) reported that increasing student involvement in schools has the potential to: build collaboration and leadership skills, increase trust between students

and teachers, improve academic performance, and increase the effectiveness of school policies and practices.

Perspective recognition

The ability to recognize other people's perspectives on issues, especially when they are different from our own, is an essential component of the decision-making and consensus building process within a democratic and pluralistic society (Hess, 2009; Johnson & Johnson, 2009). Barton and Levstik (2004) argue that:

> [A] central concern of social education should be equipping students with the knowledge, skills, and attitudes necessary to make intelligent decisions. This would include learning not just factual content related to society, culture, the environment, and so on, but also what they refer to as "basic intellectual skills" such as selecting information relevant to the solution of problems, identifying the underlying values involved in decisions and the likely consequences of chosen actions, and understanding the perspectives of those whose views differ from one's own (p.30).

Hess (2009) argues that schools are a critical place for engaging students in this type of intellectual work because: (1) schools are diverse places where students are exposed to people who are different from them, and hold different views than they do (as opposed to outside of school, where we tend to spend much of our time in homogeneous groups); and (2) classrooms environments can be created that scaffold students' ability to engage in meaningful deliberation around controversial issues and decisions. This is not always the case outside of school, where many discussions are aimed at "winning" arguments, rather than understanding others' perspectives and building consensus.

Developing a school culture and curriculum that involves students in deliberation and decision-making is not an easy transition for most schools. In part, this is because it

presents a major shift away from how civic education is traditionally viewed and implemented:

> Many traditional approaches towards Civic Education use a “civic virtue” approach that starts from the premise that we all already agree on what is best (on a preexisting consensus or view of the common good). In this case, Civic Education involves teaching students about how the government works and transmitting the dominant cultural/civic values in a way that presents them as fixed, inevitable, and agreed upon. It shies away from public discourse. [As a result] many schools engage students in public discourses that are based on purely rational discussions where issues of gender, religious belief, ethnicity, etc. are off limits or universalized (Barton & Levstik, 2004, p.33).

In the end, this type of restricted, didactic, and positivistic approach towards learning is a disservice to students in that it does not prepare them for the complex world that exists outside of school. It also does not prepare them for being catalysts for change, because it does not train them to recognize others’ perspectives on issues, teach them how to advocate for what *they* believe in, or develop their capacity for consensus building.

CHAPTER THREE: METHODOLOGY

Action research is for *them, us, me* (Reason & Marshall, 1987, p.112).

In this chapter I present the methodological approaches I used in this study and discuss why their combined use is appropriate for developing a *new* instructional design theory. I also introduce the two designed cases included in this study, and provide a description of the data collection and analysis techniques I used to identify key experiences and themes within and across the cases.

Action Research

While there are many definitions of action research, Herr and Anderson (2005) provide a broad definition that captures some of the common characteristics:

> Action research is inquiry that is done by or with insiders to an organization or community, but never to or on them. It is a reflective process, but it is different from isolated, spontaneous reflection in that it is deliberately and systematically undertaken and generally requires that some evidence be presented to support assertions (p. 3).

By name, action research emphasizes *action* as a core goal – developing a plan of action*,* acting to implement a plan, observing the effects of the action in the context in which it occurs, reflecting on the action as a basis for additional planning, refinement, and (re-)implementation (Herr & Anderson, 2005; Kemmis, 1982). Argyris and Schön (1991) add to this definition by emphasizing the local, situated nature of action research:

> Action research takes its cues - its questions, puzzles, and problems – from perceptions of practitioners within particular, local practice contexts. It bounds episodes of research according to the boundaries of the local context. It builds descriptions and theories within the practice context itself, and tests them there through *intervention experiments* – that is, through experiments that bear the double burden of testing hypotheses and effecting some (putatively) desired change in the situation (p. 86).

As part of the local context, it is common for action research to include an explicit personal dimension. In my case, this includes not only my own professional growth, but also my commitment toward organizational change at, and in partnership with, my school. In this regard, one goal of my study is to address questions such as: How can my research inform and improve my own teaching practices? How might my research (especially in collaboration with students, community members, and colleagues) inform policies and practices associated with place-based learning at our school?

While emphasizing change within the local context, action research can also serve as a method for producing new theoretical understandings and generalizable knowledge (Herr & Anderson, 2005). This is particularly relevant to my study, given that one goal of a dissertation is to conduct research that can be applied more broadly. According to Herr & Anderson (2005), "the dissertation represents scholarship that generally makes knowledge claims that are generalizable, or transferable, beyond the immediate setting. This means that an action research study for a dissertation must consider how the knowledge generated can be utilized by those in the setting, as well as those beyond the setting" (p.6). In this light, action research is appropriate for this study because, while I want to improve my own practices (and more broadly, teaching and learning at our school), I am also developing an instructional design theory that can be used by other teachers interested in engaging their students in place-based learning.

Design-based Research

In order to complement and strengthen my commitment to action research, I decided to also use design-based research (DBR) to frame and structure my inquiry. DBR aligns with action research, in that both approaches focus on conducting research

in, and through, authentic contexts; and advancing educational design, theory and practice (Wang & Hannifin, 2005). Despite these similarities, however, DBR is useful to my research because it emphasizes testing educational *designs* (in my case the design of an instructional theory), iteration or "progressive refinement" (Reigeluth & An, 2009), and developing theory that extends beyond the local context.

While DBR is associated with a particular set of characteristics and methods, it is part of a larger research paradigm often referred to as design research (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Hoadley, 2004; van den Akker, Gravemeijer, McKenney & Nieveen, 2006). According to diSessa and Cobb (2004), design research is "iterative, situated, and theory-based" (p. 80). Barab and Squire (2004) broadly define educational design research as: "a series of approaches, with the intent of producing new theories, artifacts, and practices that account for and potentially impact learning and teaching in naturalistic settings" (p. 2). This "series of approaches" includes: design-based research, design experiments (Collins, 1992; Brown, 1992), design research (Edelson, 2002), developmental research (van den Akker, 1999), and formative research (Reigeluth & Frick, 1999).

Because design-based research is rooted in the belief that context plays a central role in cognition and learning, a key characteristic of the methodology is an emphasis on conducting research in authentic settings. Indeed, a key factor that contributed to the emergence of design research (and one that separates it from traditional experimental research) was a desire to move educational research from laboratory settings to actual classrooms, where educational designs/interventions (and the resultant learning) could be researched in situ and interactions between

researchers, teachers, students, materials, etc. could be understood from a situated, dynamic, integrated, and holistic perspective (Barab & Squire, 2004; Brown, 1992; Wang and Hannafin, 2005). Unlike controlled experiments, which attempt to keep a small number of variables constant, rely on fixed procedures, and isolate learners to control interactions, design-based research takes place in naturalistic settings, involves multiple dependent variables, focuses on understanding the context as a complex, integrated system, and encourages the active and ongoing (re-)design of the intervention as it unfolds (Barab & Squire, 2004).

Because it places an emphasis on context and the importance of conducting research in "real life" settings, design-based research is often promoted as a pragmatic methodology that has the potential to strengthen the connection between research and practice – i.e., it can be used to demonstrate the practicality, relevancy, and usability of particular interventions in a way that often eludes controlled-experiments. Despite this pragmatic orientation, however, the goal of design-based research is not to simply "empirically tune 'what works'" (Cobb et al., 2003). Instead, design-based research seeks to develop theories that can be used to guide the design of learning interventions and explain the learning ecology that results when particular educational designs are enacted (Cobb et al., 2003; Edelson, 2002). According to Edelson (2002), design-based research is well suited for developing three types of theories that are useful to the study of teaching and learning – domain theories, design frameworks, and design methodologies.

Integrated characteristics of design-based research

As design-based research has evolved as a methodology, a number of

individuals and groups have worked to identify key principles that should be considered when developing design-based research projects. The Design-Based Research Collective (2003), a group that has played a central role in advancing design-based research, suggests that effective design-based research should include the following characteristics:

1. The central goals of designing learning environments and developing theories or “prototheories” of learning are intertwined.
2. Development and research take place through continuous cycles of design, enactment, analysis, and redesign.
3. Research on designs must lead to sharable theories that help communicate relevant implications to practitioners and other educational designers.
4. Research must account for how designs function in authentic settings. It must not only document success or failure but also focus on interactions that refine our understanding of the learning issues involved.
5. The development of such accounts relies on methods that can document and connect processes of enactment to outcomes of interest (Design-Based Research Collective, 2003, p.5).

Similarly, in their review of design research van der Akker et al. (2006), propose that design-based research is: (1) Interventionist, (2) Iterative, (3) Process Oriented, (4) Utility Oriented, and (5) Theory Oriented, while Wang and Hannafin (2005), suggest that design-based research is: (1) Pragmatic; (2) Grounded; (3) Interactive, iterative, and

flexible; (4) Integrative; and (5) Contextual. In addition to relying on these conceptualizations of design-based research, I used Wang and Hannafin's (2005, pp.15-19) nine guiding principles[4] to guide the design of my study, including the design of the learning environment, learning activities, and research methods.

Designed Cases

A case study is a research strategy that can be used to conduct an in-depth analysis of a particular bounded system (e.g., individual, classroom, community) within its "real life" context (Stake, 1995; Yin, 2008). In addition to being well suited for studying phenomenon within naturalistic settings, case studies are useful when attempting to understand processes, subjects and issues where behavioral events cannot be precisely controlled for and the relationship between learners/actors, researchers, interventions, and the context are uncertain, dynamic, and ambiguous (Yin, 2008; Gray, 2004).

While case studies are often used within design-based research to test and refine existing theories and models, the cases in this study were designed to generate a *new*, grounded instructional-design theory (Reigeluth and Frick, 1999). Reigeluth and Frick (1999) suggest the following guidelines when using *designed cases* to develop instructional-design theories:

1. *Select a situation that fits with the general class of situations to which you want your new design theory to apply.* For me, this meant developing cases

[4] Wang and Hannafin (2005) propose and detail nine guiding principles that researchers should consider when using a design-based research methodology to conduct educational research. These principles are: (1) Support Design with Research from the Outset, (2) Set Practical Goals for Theory Development and Develop an Initial Plan, (3) Conduct Research in Representative Real-World Settings, (4) Collaborate Closely with Participants, (5) Implement Research Methods Systematically and Purposefully, (6) Analyze Data Immediately, (7) Continuously, and Retrospectively Refine Designs, (8) Continually Document Contextual Influences with Design Principles, and (9) Validate the Generalizability of the Design.

where students were engaged in iterative cycles of place-based inquiry and design. It also meant designing a theory that would be applicable to a range of high school level students, including those who had previously been unsuccessful in traditional school settings.

2. *Design the best case you can for that situation, using experience, intuition, and trial and error, often in combination with knowledge of related descriptive, scientific knowledge of education*. In my case this meant building on research and practice in place-based, design-based, and democratic education; as well as my previous experiences using these approaches with students. It also meant modifying the curricular content and activities during each of the interventions in response to students' feedback, our growing understanding of local and individual needs, and ongoing analysis of what was, and was not working.
3. *The person building the design theory must be the one creating the designed case, because "intimate familiarity with the case is essential for developing good grounded theory."* This aligns with my use of action research, as well as my desire to design cases that could be used to inform my own teaching, as well as teaching and learning at my school.
4. *As you develop the case, you should develop a tentative design theory in parallel.* As I planned and implemented the initial case, I began naming and describing key components of Place-based Design. I reused, refined and better articulated these as part of the second case. Finally, I reviewed and

integrated relevant research across both cases, in response to emergent questions, needs, and challenges.

5. *Use your findings to revise and elaborate your tentative design theory.* After implementing and analyzing both cases, I developed an initial set of goals, values, and methods that resulted in the tentative version of Place-based Design presented in chapter six of this report. This version integrated core components of place-, design-, and democratic education identified through my literature review; the unique goals, values, and methods embedded in the two designed cases; and findings from my cross case analysis.
6. *Identify and describe inadequacies in the theory and discuss the types of studies you think are needed to help further the theory*. The cases allowed me to identify current methods that need to be refined and more clearly articulated, so they can be understood and used by others – e.g., current methods such as "gauge students' prior knowledge and experience" or "use field excursions to build networks" need further refinement. Similarly, because it was only developed across two cases, the version of Place-based Design that resulted from this study is tentative. As a result, further research is needed to identify additional situational methods (e.g., ones that did not come to light because of the narrow scope of the cases included in this study) (Reigeluth and Frick, 1999, pp. 644-645).

Overall, the designed cases in my study helped me identify and articulate the key goals, values, and methods associated with Place-based Design, and describe in more detail how these various components come together to produce a coherent whole. They

also helped me develop a deeper understanding of how this approach might be used to guide teachers in implementing place-based learning experiences, and brought to light some of the challenges of framing and organizing teaching and learning in this way. Finally, the cases helped me identify the types of research and questions needed to further develop and refine Place-based Design.

Design Principles

One of the most powerful aspects of design-based research is its emphasis on sharing and disseminating findings and principles, so that they can be used to inform practice (Wang & Hannafin, 2005). According to van den Akker (1999) design principles are not intended to guarantee success, but rather provide guidance for selecting and applying the most appropriate procedural and substantive knowledge for achieving specific design and development tasks (van den Akker, 1999, p. 9). According to Bell, et al. (2004), design principles differ from scientific laws in that they are not fixed, and are meant to be interpreted:

> Much in the way design principles or patterns in architecture do not fully determine the design of a house but rather can serve to guide the process in the hands of a skilled architect researchers view design principles as an intermediate step between scientific findings, which must be generalized and replicable, and local experiences or examples that come up in practice (p. 83).

One of the outcomes of this study is developing an initial set of design principles that help define Place-based Design, and guide others in enacting it in their own setting. As with other design principles, the ones that emerged from the cases included in this study are intended to be tentative and further refined across additional interventions and research studies. This goal acknowledges the limitations of producing a set of design principles through a single study and aligns with Bell, Hoadley, and Linn's (2004)

argument that the success of design principles should be gauged by their ability to effectively be used in other contexts:

> [Design] principles are generated inductively from prior examples of success and are subject to refinement over time as others try to adapt them to their own experiences. In this sense, they are falsifiable; if they do not yield purchase in the design process, they will be debated, altered, and eventually dropped (p. 83).

School Setting

Both of the cases were implemented at Middleton Alternative Senior High, a 120-student comprehensive high school that is home to a large percentage of students who have been unsuccessful in a traditional school setting. While the school is located in Middleton, a suburb of 14,000 people, it draws students from a wide geographical range that includes parts of a nearby mid-sized city, and several rural towns and villages. In addition to wanting to develop a dissertation study tied to my own teaching practice, this setting was chosen for several other reasons: (1) It represents a formal school setting, which is one of the main contexts where Place-based Design is intended to be enacted; (2) Class sizes at the school are typically small, which made it manageable to simultaneously design, implement and document the cases; and (3) The school policies and class schedule make it a good site for implementing place-based learning interventions. For example, the school runs on a block schedule – which provides relatively large chunks of time to consistently leave the building – has a flexible fieldtrip policy, and low cost transportation options. While future iterations might involve larger sample sizes and more diverse settings, I wanted to work with smaller groups for the early iterations as a way to “work out” any major issues that I did not anticipate during the conceptualization and initial development stage of the study.

Participants and Classroom Context

The first case involved twelve eleventh- and twelfth-grade students who participated in the Neighborhood Game Design Project. As part of the project students researched contested places in their community, and then designed an Augmented Reality interactive story to teach others about a controversial plan to redevelop a nature conservancy near their school. The project was implemented in an integrated social studies and language arts course I teach, called *People, Places, and Stories*. The second case involved six eleventh- and twelfth-grade students who participated in an integrated social studies and art project that was piloted as part of an art class. During the project students used mobile devices to document everyday art and artists in their community, and then used their research to co-design an exhibit at the Madison Children's Museum. While I helped plan and implement the project, it was embedded in an art course taught by Robyn Acker. My collaboration with Robyn stemmed from a professional development initiative at our school, where I was hired as an instructional coach to help other teachers pilot place-based learning projects, and help them develop greater fluency with the theory and practice associated with place-based education.

Data: Overview

As is the norm with case study research, I gathered and analyzed a range of data across both of the projects (Hoadley, 2004; Stake, 1995; Yin, 2009). In an attempt to increase the range and depth of the data I collected, and improve the validity of my interpretations, I developed a protocol for gathering and analyzing data based on three types of triangulation commonly associated with case study research: methodological

triangulation, data triangulation, and investigator triangulation (Denzin, 1978/2006; Stake, 1995).

Methodological triangulation

In an attempt to develop a multifaceted and more diverse understanding of the participants' experiences, and increase the likelihood that I thoroughly captured the phenomenon, I gathered data using a variety of methods, including: (1) daily observations and field notes; (2) short surveys and questionnaires after "key events" in the curriculum; (3) student generated artifacts (e.g., proposals, prototypes, final designs, design journals); (4) teacher generated artifacts (e.g., handouts, agendas); (5) small group and individual interviews; (6) video of large and small group debriefing and critique sessions; and (7) video and photographs of students' interactions as they worked, both during their field excursions and in the classroom/studio (See Table 9).

As part of my data collection process, I actively sought to collect data sources that proved useful in contradicting or problematizing a particular account or interpretation. I also conducted member checks during the study as a way to strengthen both the accuracy of the data collected and the validity of my ongoing interpretations. This primarily occurred via informal conversations, as part of large group debriefing sessions, and during individual exit interviews.

Data source triangulation

Data source triangulation is used to "see if the phenomenon or case remains the same at other times, in other spaces, or as persons interact differently" (Stake, 1995, p.112). In order to employ this method I gathered data across time, participants, and situations. I also collected data via different means (e.g., group/ individual interviews,

written/ oral responses, interview with me/ interview with a secondary researcher, observations in the classroom/ observations in the community), and sought instances where individuals disagreed about, (re-)interpreted, and/or experienced an event or interaction differently. Overall, gathering data from different sources allowed me to employ comparative analysis as a way to identify consistencies, inconsistencies, and variation in participants' perceptions and behaviors. This approach follows Stakes' (1995) statement that data source triangulation "is an effort to see if what we are observing and reporting carries the same meaning when found under different circumstances."

Table 8. Data Collection and Initial Analysis

Type	Description	Notes
Whole Group Opening Circles and Debrief Sessions	These sessions were embedded in the curriculum / learning environment. They served as opportunities to gauge students' conceptual understanding and get feedback on the design.	Whole group opening circles and debrief sessions were used to quickly gauge students' perceptions, opinions, beliefs and attitudes about specific activities. This data was used to broadly identify components of the curriculum/learning environment that were effective and/or needed refinement. This approach helped us identify initial themes and develop questions that we followed-up on during the individual student interviews.
Daily Observations and Field Notes	These were open ended, but driven by two main goals: (1) To describe the curriculum, learning environment and interactions, and (2) To record initial questions, notes, and memos.	While an attempt was made to capture a range of activities, we focused on key moments in the intervention (e.g., critique sessions, field activities, public playtests). Also note that some, but not all of the class activities were videotaped (in part in order to control the amount of data that was collected). Daily observations were shared via an online document as a way to corroborate and calibrate accounts. They were also used as entry points for the ongoing research/team meetings (see Researcher Meetings below).
Student-generated Artifacts	Student proposals, prototypes, design journals, reflections and final designs.	These were analyzed to look for changes in students' understanding of core content and concepts.

Teacher/ Researcher Meetings	Ongoing debriefing, analysis, and re-design meetings.	We met as a teacher/research team as the study unfolded in order to compare notes, memos, questions, and emergent thinking and address any issues that arose. We also generated written narratives as the study unfolded as a way to check each other's thinking and understanding of the context, learning environment, and learning. We also used these sessions as a way to progressively focus on a few key concepts. Some of the debriefing meetings conducted by the researchers were videotaped so that we could analyze how our thinking changed across the implementation.
"On the fly" Interviews	Informal "think aloud" and initial response interviews.	These short interviews were conducted while students were engaged in day-to-day activities (or immediately after).
Exit Interviews	Semi-structured interviews after the intervention ended.	While the exit interviews were designed to progressively focus on themes that emerged during the implementation, they were semi-structured so that participants had an opportunity to discuss and explore issues that were central to their own experience(s) as learners within this context.

Investigator triangulation

As part of each case I collaborated with another teacher/co-researcher. In addition to these central co-researchers, on some occasions (e.g., special community events) I also sought help from colleagues, both from the school and from my other professional networks, to make observations, take photos/video, and share their interpretations of what they saw. Having additional researchers as part of the study added to the richness and breadth of the data that was collected. It also brought a different perspective in terms of data collection (e.g., others paid attention to things that I missed or considered unimportant), and interpretation (e.g., others suggested alternative explanations of phenomenon and brought different theoretical frameworks into play).

A special note on interviews

Because a major aim of this study was to gauge students' perceptions, opinions, beliefs and attitudes about specific activities and the overall learning environment, interviews played an important part in the data collection process. The interviews fell into three broad categories: (1) Open-ended "think aloud" interviews conducted while students engaged in their inquiry and design work. A main goal of these interviews/conversations was to shed light on students' experiences and conceptual understandings while they were in the process of completing tasks; (2) Small-group interviews completed on a rolling basis throughout the implementation. These usually followed specific activities and were aimed at both understanding students' experiences and soliciting their feedback on how the activity might be improved; and (3) Individual exit interviews conducted at the end of the implementation. The exit interviews were designed using a semi-structured interview protocol. While they began with a set of pre-defined introductory questions, the interviews evolved based on the nature of the interviewees' responses. As such, there was no expectation that each interview would have the same number of questions or that the same questions would be explored across interviews. The goal was that this approach would result in more dynamic interviews and allow us to identify and explore issues and experiences that were important to the participants (vs. my own concerns as a researcher) and open up new lines of inquiry. This strategy was amplified by bringing in a second researcher, who conducted some of the interviews, helped analyze some of the data, and provided feedback on my analysis.

Data: Timeline and Analysis

While I collected and analyzed data throughout the implementation, the study was divided into two phases. Phase one of the data collection/analysis process took place *during* each of the implementations and focused on collecting and analyzing data in situ, in order to make changes to the implementation as it progressed. During this time, I used short surveys, questionnaires, and interviews to get quick feedback from students related to their engagement, general reactions to the experience, and conceptual understanding. I also made observations, compiled field notes, analyzed student artifacts (e.g., designs, design journals) and wrote-up daily reflections/memos that included emergent questions and initial reactions/analysis (Glaser, 1978). As part of this process I met (both face-to-face and via a shared online work space) with my colleagues after each class period to compare and discuss our individual observations, notes and interpretations; and begin coding and categorizing the data in order to identify emergent themes (Creswell & Clark, 2006; Glesne, 2006; Miles and Huberman, 1994). Part of this included developing hypotheses regarding the design of the intervention (by default some of these are already embedded into my initial design), coupling my data collection and analysis in a way that allowed me to find cases and examples that didn't support these hypotheses, and reformulating my hypotheses to account for these new instances (Gray, 2009).

To support this process I borrowed from some of the methods associated with a grounded theory approach[5] (e.g., I utilized memos and constant comparison and

[5] I have had success using some of the methods associated with grounded theory as part of my previous research. In doing so, I recognize that I am not using a grounded theory methodology, but only utilizing some of the methods typically associated with grounded theory. In part, I make this qualification here in

theoretical sampling) (Glaser, 1978). According to Glaser and Holton (2004), "theorizing in grounded theory is an emergent process generated by continuous cycling of the integrated processes of collecting, coding and conceptual analysis with the results written up constantly in memos." Two key methods employed during the process of moving from raw data to concepts and theories are *constant comparison* and *theoretical sampling* (Glaser and Strauss, 1967; Glaser, 1978). *Constant comparison* is an iterative process that involves collecting and coding data (using different levels and types of coding), memoing, and (re-)grouping codes in a manner that allows concepts to emerge naturally from the data. A key characteristic of this process is that data analysis is done in conjunction with data collection as a means of comparing incidents and emergent categories. *Theoretical sampling* involves selecting new data and data sources in order to focus, delimit, and test theories as they emerge. The new data (e.g., from new groups or instances), which is selected to provide comparison across groups and/or within groups, allows researchers to generate categories and their properties (Glaser, 1978).

As mentioned, analysis during phase one of the study focused on experimenting with different design strategies and making design/redesign decisions as the project was in progress. While I gathered other data during this first phase, due to time constraints, it was not thoroughly analyzed until phase two of the study. The second phase of the study included a second round of analysis that incorporated the longer exit interviews as well as video footage and photos of the students' interactions in the field and in the classroom.

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order to acknowledge Glaser's concern that Grounded Theory has been too easily lumped in with other types of qualitative research (see Glaser & Holton, 2004).

Participant Observer

As part of this study I took on the combined role of teacher, designer, and researcher. While this combination afforded some unique opportunities, it also presented some unique issues and challenges. Throughout the study, I worked to identify and problematize these issues and consider the implications of my research from the perspective of the students, the school, and the broader research community.

Using an action research methodology allowed me to leverage my insider knowledge of the local context (as well as my past teaching experiences) to meet the emergent needs of my students, while providing a systematic approach that guided how we planned, implemented, and reflected on the interventions we developed. Being an insider also made it easier to develop collaborations between various people involved in this study, including my teaching partners, students, and educational researchers.

While it offered many benefits, my insider perspective also presented some challenges. I was particularly concerned with the power relationship I had with the students/participants. In order to address this concern I was sensitive to their rights not to participate in the study (either in whole or during particular segments/activities) and I worked hard to establish a level of transparency regarding my role as a teacher/researcher. I also provided opportunities for the students to share their perspectives on and shape the design of the curriculum/learning environment and actively paid attention to (and included) their voices in the final report. Part of this involved implementing the triangulation methods discussed above, particularly member checks (Stake, 1995).

Additionally, I was concerned that my position as a researcher/designer/teacher would impact my ability to remain neutral during the data collection and analysis stages of the project. As mentioned previously, a major way I attempted to address this issue was by involving a second researcher. I also made an effort to be sensitive to my own positionality during the data gathering and analysis processes and refined the research protocol as needed in order to address any issues that arose related to this concern. Despite these challenges, I believe that this study was warranted in that my centrality and proximity to the context provided a unique opportunity to develop a new place-conscious instructional design theory that was grounded in a classroom setting.

CHAPTER FOUR: CASE ONE – NEIGHBORHOOD GAME DESIGN PROJECT

In this chapter I present the Neighborhood Game Design Project, a curricular intervention (and designed case) that combined key components of place-based, design-based, and democratic education.[6] The project, which was embedded in a community studies course I teach, called *People, Places, and Stories*, was designed and implemented in collaboration with Mark Wagler, a teacher, researcher and folklorist who has extensive experience developing place-based learning experiences in K-12 settings. Together, we implemented the project with twelve eleventh- and twelfth-grade students over the course of an entire semester.

Traditionally, students in *People, Places, and Stories* conduct research on local issues that interest them, then design media (e.g., photo and video documentaries) and associated events (e.g., photo exhibits, film screenings) to communicate their findings and personal perspectives on these issues. While the Neighborhood Game Design Project maintained this emphasis on inquiry and media design, it expanded on past instantiations of the class in two important ways: (1) it introduced mobile media into the learning ecology in a way that explicitly sought to leverage the unique affordances of mobile devices to support students' community investigations; and (2) it engaged students in playing and designing place-based mobile games and interactive stories.

In alignment with the overall goals of this dissertation study, the goal of developing, implementing, and analyzing this designed case was to generate a new, but tentative, instructional-design theory (i.e., Place-based Design) that combines key

[6] Portions of this case have appeared in two previous publications: Mathews, 2010 and Mathews & Holden, 2012.

elements of place-based, design-based, and democratic education. In support of this broad goal, the case study was designed to:

1. Describe how key elements of place-based, design-based, and democratic education were combined to develop and implement the Neighborhood Game Design Project.
2. Identify key themes that emerged in relation to students' experiences learning within this context.
3. Identify critical components of the intervention and consider how they might be used to define the goals, values, and methods associated with Place-based Design.[7]
4. Consider how the key themes and critical components might be used to develop design principles that can be applied by others interested in using Place-based Design to guide their own teaching.

Building Blocks

To guide the initial design of the Neighborhood Game Design Project we began by asking three framing questions: What broad area(s) of interest or exploration will be central to the work? What place(s) will be central to the work? What design challenge(s) will be central to the work? While the intent of asking these questions was not to plan out detailed activities for the entire duration of the project, they proved useful in several ways: (1) they helped us identify some initial opportunities, challenges, and needs associated with implementing the project; (2) they helped us set preliminary goals and

[7] As mentioned previously, Place-base Design is not an instructional-design theory being tested through this case. Instead, it is an emerging or tentative theory that was developed in parallel with this implementation.

parameters for the project; and (3) they provided direction for planning the initial activities and methods we used to frame the project and get it off the ground.

It is important to note, that while we used these questions to plan our initial activities, we remained sensitive to our goal of maintaining fluidity. That is, while we sought to establish some constraints to guide us, we also wanted to adapt to students' interests and needs, and respond to emergent learning opportunities. As a result, we were open to answering these questions by saying: "it's too early to tell," "it depends on who the students are," or "it depends on the interactions and questions that emerge from our introductory experiences."

What broad area(s) of interest or exploration will be central to the work?

While we ultimately wanted students to select issues that were important to them (and subsequently propose their own project ideas), we also anticipated from past experience that they would need time and support to generate ideas. As a result, we decided to organize the project around a central concept – *contested places*. I had previously used *contested places* with my students and found that it provided a lens that encouraged them to dig more deeply into the cultural conflicts and negotiations that occur in places as they are designed, re-designed, and inhabited; and served as an entry point for helping them explore places from multiple perspectives.

While the concept of contested places has complex layers to it, we decided to begin with a simple definition, so that we could "get up and running" quickly. Because we did not want to frontload, or overload, the students with too much content, we decided to develop their understanding of contested places across a series of introductory field activities.

In addition to developing students' understanding of contested places, we anticipated that these initial activities would also help them identify topics or places that were of interest to them. As a result, we framed these introductory activities as "on ramps," for both students' conceptual understanding and for developing questions and ideas for further exploration. In following this trajectory, we designed the project so that students would be able to transition from these initial guided activities to more open-ended inquiry and design activities where they had more freedom to explore places and issues that appealed to them.

What place(s) will be central to the work?

We decided to locate our initial field experiences near the school, so that fewer resources (e.g., time, transportation) would be required to organize and enact them. However, because we also wanted students to explore places and issues that were of interest to them, we designed activities that were generic enough to be applied in various contexts. This provided students with an opportunity to explore places on their own outside of school, and also left the door open for us to decide as a class to engage in follow-up field activities that were not in close proximity to our school. The concept of contested places met these criteria because it could be used to analyze a variety of places and contexts. This proved important because it allowed us to easily introduce basic fieldwork strategies in and near our school, even though the longer-term goal was to expand our work into the broader community.

What design challenge(s) will be central to the work?

The overarching challenge for the students was to design a media artifact or experience aimed at teaching others about a contested issue in our community. While

this was somewhat open-ended, the initial inquiry and design experiences helped students narrow their focus – both in regard to the issue or place they wanted to study, and media they eventually chose to work with.

One reason for organizing the design challenge around media production is that the class was listed in the course catalog as a place-based media design course. While media was defined broadly in this context, in past instantiations of this course, students typically used photography and video to document and tell stories about their community. While I wanted to honor this tradition (mainly because many students signed up for the course expecting this to be the case), I also wanted to expand the media we used to include mobile-based storytelling. My previous work in this area suggested that this addition would interest students. As a result, I included an Augmented Reality storytelling workshop as one of the opening activities and obtained the appropriate resources (e.g., mobile devices, software) so that students could choose to use this medium as part of their final project if they had interest in doing so.

Core Phases: Overview and Descriptions

The Neighborhood Game Design Project consisted of three curricular phases that unfolded over a three-month period[8]. While there was some overlap between the phases, the general trajectory of the project moved from a series of initial inquiry activities, to students "digging deeper" in one area of inquiry and design, to a final presentation and reflection on their work.

The first phase included several inquiry activities where students engaged in exploratory fieldwork (e.g., photo mapping, interviewing) as a way to generate ideas for

[8] This included 60 hours of student contact time.

places and issues they might want to investigate further. The second phase included a series of mobile design workshops where students individually and collaboratively designed Augmented Reality (AR) games and stories using mobile devices. During this phase students learned how to use the associated technologies (e.g., mobile devices and software tools, especially AR game editors and engines), and began thinking about how AR could be used as a medium for place-based storytelling. The third phase consisted of a sustained design project where the entire class collaboratively identified and researched a community issue, and designed an AR story to teach other students and community members about the issue. As part of the design process, students brainstormed design ideas, developed and refined prototypes, engaged in critique/feedback sessions, and piloted a beta-version of their simulation. In the end, they designed an AR story, *To Pave or Not to Pave*, and organized a kickoff event to officially release their design.

A key goal that linked these phases was a desire to develop students' understanding of design by engaging them in interpreting and analyzing designs (e.g., designed spaces/places and games), and engaging them in formal design processes. To support this goal we worked to cultivate a learning environment that engaged students through authentic design problems and practices; nurtured students' individual and collective identity(-ies) as designers; and balanced individual autonomy with group interdependence and shared design and learning goals.

Phase One: Getting up and running

A key goal of this phase was introducing students to the overarching conceptual frameworks that anchored the project. While this included introducing the concept of

contested places, it also included discussion of the difference between place and space and exploration of different lenses and methods (e.g., mapping, observations, interviewing, photography, etc.) for documenting places. While we sometimes introduced new concepts via short discussions or by providing examples, we focused on developing students' understandings through field experiences and follow-up debriefing sessions.

In an attempt to hook students and orient them towards doing fieldwork, we developed a simulation that invited them to role-play as consultants hired by the city to locate contested places and issues within the downtown area. As they walked around town in pairs, looking for, observing, and analyzing contested places, the students used mobile devices to conduct interviews, take photos, access "just-in-time" information, and record notes. While they had the freedom to explore the small downtown area on their own, without direct supervision, we remained in contact with them (and vice versa) as needed via text messages, face-to-face conversations and e-mails.

While some students primarily used "pen and paper" to document their investigations, others relied more heavily on mobile devices. For example, some students used GPS-based mapping applications on their mobile devices to geo-tag, organize and map their images and notes. Because this was not a requirement, however, students who chose this method did so based on their own interests, prior knowledge and motivation. This approach aligned with three key features of the project: (1) to develop activities that could be completed using a range of technologies – from "low-fi" (e.g., paper maps) to "hi-fi" (e.g., mobile-based mapping software); (2) to provide students choice in how they decided to gather information and represent their thinking;

and (3) explore how the unique affordances of mobile media - particularly those related to their mobility/portability, social interactivity, context sensitivity, and connectivity - might be used to support collaboration, communication, data collection, and documentation.

Sample activity one: Opening simulation.

As the students enter the classroom I inform them that the activity planned for the day has been canceled because a new mission has come in. I share that it has something to do with a request from the city, but ask them to check their email to learn more. I also nudge everyone to “move quickly” because “we need to get started as soon as possible.” Before sitting down, the students either pull out their own cell phone or grab one of the phones laid out on the table in front of the room. When they open their email, they see a new message. It is from Mike Davis, but none of them recognize the name.

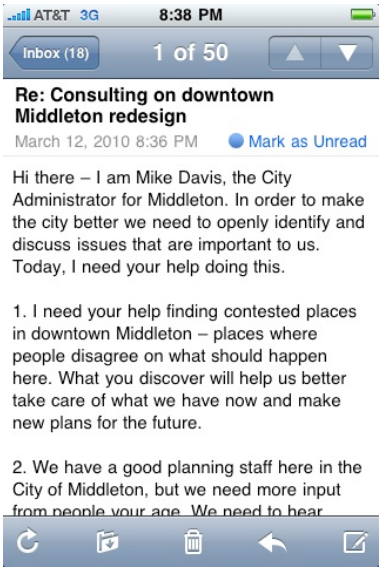


Figure 3. Email message students received from the city administrator.

From the email they learn that Mike Davis is the city administrator who helps manage our local city and that he is seeking input from young people about how the downtown area could be improved. As the students read more they begin to realize that today is going to be a *fieldwork day*. This means they'll be heading out into the community to do research. Near the end of the email they also discover their next task – head down to City Hall for a brief meeting in the city planning room.[9]

As students finish reading the email, everyone slowly transitions to the *daily opening*, which is a check-in that happens at the start of each class session. At this point, everyone is sitting down in one of the chairs arranged in a circle in the middle of the room. I begin the circle by confirming that we are heading downtown to meet with Mike Davis, followed by a fieldwork activity. I tell them that they will get more information once we arrive at City Hall. Next, I ask if there are any questions about the email or the activities planned for the day. One student asks if we'll be back for lunch. I answer, yes. While our *opening circles* usually include an informal check-in with students, I ask if we can skip this today because we have a limited amount of time. Everyone puts their thumbs in the air, which means the answer is yes – a result that is by no means guaranteed. Finally, I ask if there are any students who would prefer to stay back and work on other work. This time, the answer is no.

"Okay, everyone grab your stuff. I did not get transportation today, so we'll be walking." One of the students groans because she is wearing flip-flops. I remind her that everyone agreed to bring in some spare clothes for situations just like this. I also remind her that she does not have to go if she does not want to. She says that she wants to go

[9] While this activity was a simulation, Mike Davis agreed to participate by playing himself. In this way, the simulation became a hybrid that combined play with real-world roles, challenges, issues, and questions.

and the conversation ends at that. Before heading out the door, the students each grab a clipboard (although one of them needs to be reminded to do this and another sets hers down, then forgets to pick it back up when she leaves) and something to write with. They also bring along a phone, either their own, or one they grabbed from me at the start of class. At least it's sunny today. The last excursion we went on ended early because of heavy rain. Next stop… City Hall.

When we arrive at City Hall we gather in the map room, which is a conference room used for city planning meetings. It takes a few minutes for everyone to get accustomed to sitting in the big executive chairs. There are a few comments about how we need chairs like this at our school. Mike Davis is running late, so we spend a couple of minutes as a group talking about the maps hanging in the room. I direct their attention to a few of them and explain that one of the things we'll be doing today is making our own map. When Mike comes in, he apologizes for being late, but explains that he has been working on a time sensitive issue. He has a friendly way about him, which helps the students feel at ease. When Mike introduces himself he explains a little bit about what he does for the city, but also makes a point of referencing our school and providing a few examples of things he has heard about the type of work we do. Then, he jumps into describing why he asked us to come in today. In a nutshell, he is looking to learn more about people's concerns about downtown, and is especially interested in learning more from young people. In order to help, he invites the students to document contested places in the downtown area and then return to City Hall to share what they discover. He asks them to take pictures and do some brief interviews. He also asks that they map the things they learn, so that we can compile a bigger map when we return. I

give each team a handout that includes a map, a few additional directions, and some tips for specific types of things to look for – e.g., issues related to accessibility, noise, safety, etc. The students tell us that they don't need any additional information to get started. Mike says thank you and tells them that he will meet them back in the map room in ninety minutes. The students quickly form teams of three and "hit the streets."

All of the students have permission forms allowing them to conduct fieldwork on their own, or in small groups. As they begin their exploration the students use the basic framework we provided to identify and document contested places and issues. During this time Mark and I make a point of touching base with as many groups as possible in order to check in on their progress and provide them with some informal feedback on their findings. The students also have my cell phone number and know they can call me if they have any questions, or need help with something.



Figure 4. Students investigating contested issues and places in their community.

After spending an hour and a half in the field, the students return to City Hall, where they compile their observations onto a large group map and re-connect with Mike Davis. Mike starts the meeting by asking students to report their findings. During their presentations, the students discuss the contested places they discovered, as well as ideas for how the downtown area could be improved. Many of them present their arguments and evidence using photos and audio interviews they captured with their phone. At one point a conversation develops around ideas for how the city could do a better job of attracting visitors, particularly young people. One student suggests that one of the empty storefronts be turned into a gallery where local artists, including high school students, could show their work. Another suggests that events held in the downtown area should be modified to include more youth-friendly activities and that current activities should be advertised through the school. Throughout the meeting Mike listens to the students' ideas and responds to their questions. He also asks them some follow-up questions – challenging them to think in greater depth about their suggestions, and what it would take to move their ideas forward. He reminds them, however, that none of the ideas or suggestions they shared are impossible to make happen.



Figure 5. Students discussing questions and ideas related to the redesign of the city with the City Administrator.

The goal of this activity was multifaceted, and included: (1) setting the tone of the project (i.e., this project is about actively studying our community); (2) providing a context for students to apply and develop their understanding of *contested places*; (3) getting students started practicing basic ethnographic techniques; (4) sparking students' interest in doing place-based investigations and introducing them to people, places, and issues they could refer back to later in the project; (5) providing students with a direct avenue for communicating with a city official whose job includes city planning; and (6) encouraging students to begin thinking of their neighborhood, school, and city as designed places and systems.

The students reported that the activity was meaningful to them – a perspective exemplified in the following quote from Kim:

> I thought that was really cool. It made me feel that if there were a meeting, I would want to go to it. There were things that we found that we could say to him. 'We found this. Here's a picture. Here's a fact and my passion to back it up. I feel strongly this should be fixed.' He listened to it. I tripped on that sidewalk and he went out there afterwards and he measured it, and he said we know this should be fixed. I did something to fix that. I was the one who said something. If I hadn't, someone could have tripped and gotten hurt. I feel that was one of those times where I could really do something. I can talk to my council and maybe get things changed if I feel it needs to be.

Table 9. Phase 1: Getting Up and Running			
The goal of this phase was to introduce the design challenge and conceptual framework(s) being used to anchor the project.			
Substantive Emphasis		**Methods**	**Comments**
Establish an enabling context **Establish a design hook** **Introduce key framework / lens(-es)**	Create an enabling context that engages students and serves as an “on ramp” to their initial inquiry and use of the key lens(-es). Bring to light students’ interests, questions, and prior experiences. Establish "working definitions” and preliminary conceptual understandings. Identify student strengths, needs, and interests – “looking for sparks” or “planting seeds.” Generate new questions and clarify concepts and definitions. Establish contacts and build networks. Introduce and develop basic ethnographic techniques. Provide groundwork for future field excursions (Phase 2).	Used three semi-structured exploratory activities to immediately get students into the community doing “low stakes” investigations. Provided a brief overview of contested places, then quickly ran a simulation to grab students’ attention and got them using contested places as a lens for exploring their school and community. Brainstormed different methods for studying and understanding place. Practiced and reflected on basic ethnographic techniques, both in the field and in the classroom. Emphasized developing understanding of framework/lens – e.g., clarifying, defining, relating to.	One design goal was balancing clarity of the challenge, engagement, and time, so that students had just enough context and information to “get up and running.” Connected with Mike Davis, the city administrator as well as several business owners and community members. Note that the goal was not to fully understand the framework or concept at this time. Students need enough background and framing to engage in the next phase.

Phase Two: Mobile design workshops

While we continued exploring our community through the lens of contested places, a major goal of the second phase was engaging students in playing and designing place-based games. We started by having students play, critique, and

redesign several place-based games and stories that Mark and I created. In some cases, we provided students with partially completed games, and then had them add content and/or quests. Next, we organized several mini-design challenges where students designed their own games and stories around local places and issues. These activities focused on three main goals: (1) develop their understanding of games as designed systems; (2) develop their understanding of and ability to employ formalized design processes and methods; and (3) expand their thinking about how these technologies might be used to design place-based learning experiences.

Specific to the design process, we focused on identifying and setting design constraints, using iterative design cycles, and providing effective critique/feedback. From a game design perspective, we focused on developing students' understanding of games as a dynamic system of interconnected elements (e.g., rules, goals, resources, game space) that can be manipulated in order to shape game play, and as a result, players' aesthetic experiences. Throughout the project, but especially during this component, we made a conscious effort to link students' prior knowledge and interest in games, with the concepts we were studying.

These design experiences were also aimed at helping students unlock the features and affordances of different mobile gaming and story platforms (e.g., Scvngr, MITAR, ARIS), and exploring how these tools might be used to engage others in thinking about the contested issues and places in their community. As part of this exploration, we introduced students to the concept of experience-centered design, and encouraged them to use this approach when developing their own designs.



Figure 6. Students engaged in a game critique session.



Figure 7. Students beta testing a mobile game during the game design component.

Table 10. Phase 2: Place-based Mobile Design Workshops			
During this phase students further develop their understanding of the framework/lens through a combination of field excursions and micro-design activities.			
Substantive Emphasis		**Methods**	**Comments**
Play, critique, and redesign mobile-based games	Introduce students to the tools and key ideas associated with place-based mobile games.	Students played games and stories we designed. Modeled soliciting, processing, and using feedback to improve designs. Located, analyzed, and shared examples/findings.	Emphasis on the local – including students' personal experiences of place – is one factor that separated this approach from many case-, problem- and design-based instructional theories.
Design mobile-based games	Introduce students to mobile-based authoring tools. Develop students understanding of basic design processes and methods appropriate for media design.	Students designed their own games. Engaged students in planning, building, testing, and redesigning their own designs. Emphasized iterative design and critique (e.g., processes and methods for getting and giving good feedback).	This sequence of activities provided an opportunity to introduce students to design processes and methods. It also provided opportunities for them to use tools and media they could explore further during the design phase (Phase 3).

Phase Three: Design intensive

The first step in this phase was facilitating a structured brainstorming session, where students generated ideas for an extended design activity they would collectively do as a class. While their initial ideas stemmed from the field activities we did earlier in the project, the students eventually decided (via a class discussion and vote) that they wanted to learn more about a recent decision by the city to redesign the local nature conservancy. Importantly, this was not an issue that Mark or I had considered as something that might interest the students.

A key feature of the city's decision to redesign the conservancy called for paving one of the main paths – something that many of the students disagreed with. In addition to feeling a sense of ownership over the path, in part because it runs adjacent to the school, some of the students believed that the city moved forward with the plan despite strong public opinion against it. During the discussion one student asked, "What was the decision making process?" Another student mentioned her concern that the development was going to impact the "natural feel of the place." Others agreed, stating that a path would be too man-made and not aesthetically pleasing. One student mentioned that adding bridges took away from the experience of using the steppingstones that had traditionally been the only way to traverse the creek. Others suggested that the path would lead to lower water quality because of run-off. A couple of the students did not know that the conservancy was there, but stated they were open to learning more about it.

When asked why she thought students were interested in learning more about the path, Kate suggested that they were simply curious about how the decision was made:

> Well, a lot of the students use the path, first of all. Like, I use it too. I walk home and stuff… we just wanted to know why they decided to pave it, and like what the reason was, and like if they even asked anybody if they agreed or not. – Kate

She also added that students are usually left out of the decision making process:

> Personally I don't think students get enough say in anything. They're just like, 'oh, who cares what the students think.' But it's like a lot of the students actually do use the path, and it's like I don't think they look at it that way. They should have been like – I think they should have like taken polls at the school here and the middle school because a lot of students do use it. But, I don't think they'd care about what we would have to say anyway.

In the end, the group decided that studying the decision to pave the path (along with its impact on the health of the conservancy) was important, and that other students would be interested because many of them use the path. They also felt that an AR simulation would be a good way to raise students' awareness about the development and provide an opportunity for them to contribute to the debate surrounding it. Finally, as part of their initial inquiry the students learned that the current development only applied to one section of the conservancy. As a result, while they could not stop the current development, they believed they could protect other sections of the conservancy that are even "more natural" than the area behind their school.

> Even though they already [paved] that one part, they still have the northern part. If like, we can still defend or protect the northern part of it, so that it still looks natural, and it's not like ruining homes for the animals and stuff. They already have one part of it that's more accessible now . . . I don't think they should have to change the other part of it. Just leave that part how it is and stuff. – Angela

> Yeah [at first] I didn't really care because, like it's already paved. So, we can't do anything about it. But then I got more interested when we were, like positioning to keep the north side of it not paved. Because, I don't know, because at first it was like, we can't do anything about this, but we could do something about that part. And I feel like, why can't I help to not pave that part? – Rochelle

The students' intuition and timing was excellent for several reasons: (1) their belief that other students would be interested in this issue proved insightful and accurate; (2) the use of AR generated enthusiasm and provided an excellent medium for exploring the issue, and (3) the public debate over the path produced a flurry of newspaper articles and opinion pieces, blog postings, and contentious city council meetings that students mined in order to create their final design.

Scaffolding the inquiry process.

The students envisioned that their story would raise people's awareness about the impact of the redesign and contribute to the conversation about whether other parts of the conservancy should be saved from a similar fate. If they were going to meet these goals, however, they quickly realized they had a lot more to learn. As part of this, they agreed that they needed to identify key issues and perspectives surrounding the debate, conduct fieldwork and documentation in the conservancy, and learn more about mobile storytelling and the associated technologies.

We started by facilitating a discussion where students shared what they already knew about the plan to redesign the conservancy, and developed a set of questions they wanted to be able to answer. Next, we asked them to briefly write about their personal opinions on the topic. I used students' writings to produce a very brief AR interactive story, where each student was represented as a virtual character. This allowed the students to read each other's opinions and perspectives by virtually meeting and interviewing them (as virtual characters) in the conservancy. We asked the students to critique this design, and then used their feedback to establish an initial set of criteria and goals for their own AR design.

Instead of asking the students to develop their own research trajectory from scratch, we decided to seed their inquiry in two ways: (1) we provided them with a set of "starter materials" that framed some of the main points of the debate, and (2) we developed a field activity where they made observations in the conservancy and interviewed people about how they used the area and their perspective on the redesign.

The starter materials included a short video of a city council meeting where the redesign proposal was discussed, brief minutes from a second meeting summarizing the key points citizens made in favor of and against the plan, and a newspaper article where different perspectives on the plan were presented. We developed an analysis guide to help the students pick out the key arguments and types of evidence people used (e.g., using scientific data, personal experience, etc.). The initial field activity included *Fieldwork Cards* that provided mini-challenges for students to do as part of their investigation. The cards also provide scaffolding for students, both related to things to look for in the conservancy (e.g., contested places) and methods (e.g., tips for how to approach people when you want to interview them).

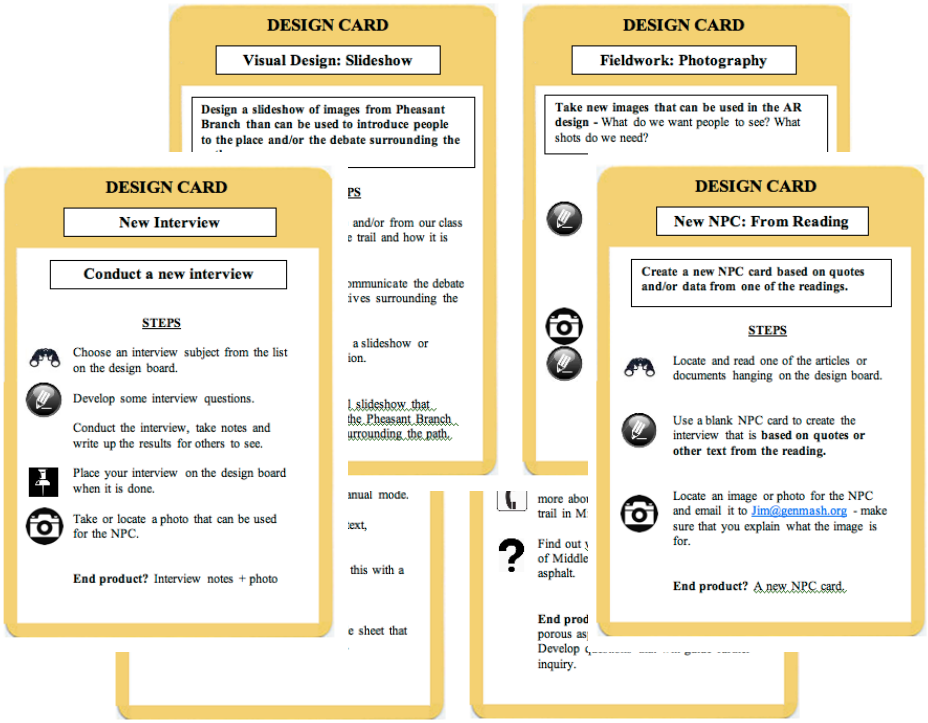


Figure 8. Examples of the design cards we developed to scaffold students' inquiry and design work.

These initial activities were helpful in that they generated new, and deeper questions, and provided entry points for students to follow their own interests and lines of inquiry. For example, two students became interested in water quality and began researching porous pavement in relation to run-off. They also ran some informal water run-off tests on the pavement, and tracked down some water quality testing kits from the science teacher in an attempt to measure water quality before and after a rain event. Another student became interested in birding and began learning more about the bird species and migration patterns in relation to the conservancy. One of the things she discovered was that the timing of the construction would potentially impact migration patterns. As part of this she began reading several blogs related to birding in the conservancy, and exchanged numerous emails with Tim, a local birder and opponent of the development. Tim eventually became a character in the final design – representing the perspective of birders and sharing some of his knowledge of local species. Two other students followed their interest in photography and video, and became the "go to" people when other students needed media artifacts for the final design. A fourth student was motivated to learn more about AR and the mobile technologies we were using. He became one of the experts in this area and helped when others ran into technical issues.

To Pave or Not to Pave: An Augmented Reality simulation.

As we guided students' transition from these initial inquiries to their final design, they decided on three important design goals: (1) they wanted to present the redesign of the conservancy from multiple perspectives; (2) they wanted users to reflect on their own perspective about the redesign, and decide whether other parts of the conservancy

should be similarly developed; and (3) they wanted the experience to end by having the users decide whether or not to sign a petition asking the city to place a moratorium on future development in the conservancy.

As part of the design process, students produced all of the content (e.g., text, photos, videos, audio clips, HTML files, etc.) and organized it into a coherent narrative. To guide their design, the students (with our help) negotiated some additional design goals: (1) balancing the physical space, game text, the number of virtual characters, and the amount of text in a way that allowed the simulation to flow well; (2) engaging the players with the physical environment (i.e., they did not simply want the player to walk around looking at the screen); and (3) presenting the issue in a balanced manner. This last goal resulted in a minor debate, as there was some disagreement between students over whether or not the simulation should be activist or persuasive in nature, particularly given that it was being designed for use in a school setting. This emergent design consideration provided an opportunity to discuss issues related to representation, the goals of schooling, forms of activism, and documentary media, etc.



Figure 9. Students composing and editing game text.

Designing the AR simulation, including learning more about the conservancy and conducting research into the multiple perspectives surrounding the redesign, required students to work across multiple modes of representation and use a range of literacies. In addition to authoring the game and the embedded media, the students also produced planning/design documents; created, distributed, and analyzed surveys; composed and sent emails; wrote in their journals; conducted interviews; and did Internet and field research. In order to write the game text they also read newspaper articles, weblogs, and city council minutes, then pulled the key ideas from these texts and rewrote them as dialog events (i.e., the text that the virtual characters said when players encountered them in the conservancy). As part of this process students used a range of digital technologies, both those specific to the medium (e.g., the handheld computers and AR authoring tools) and those required for collaboration, communication, and media production (e.g., email, text messaging, photo and video editing tools). Perhaps most importantly, through all of this, the students engaged in literacy practices required to interact and learn in a participatory design community.



Figure 10. Students designing a mock-up of the final AR simulation.

As a result of their design work the students produced an AR place-based story called *To Pave or Not to Pave.* In this mobile-based interactive story visitors to a local nature conservancy meet a “concerned citizen” who informs them about a city plan to pave a path in order to create an off-road bike route. He then asks if they would like to sign a petition opposing the development, suggesting they learn more about the issue before doing so. As visitors walk the remaining sections of the path they watch videos and interact with virtual characters who share their perspectives on the development plans. These characters, all of whom are based on real people the students interviewed, also share their knowledge about the conservancy’s history, ecology, and use. At the end of the path visitors learn it is too late to fight the initial development plan, but are asked to sign a petition asking city council members to pass a resolution restricting similar development in other parts of the conservancy. This real-world petition, which was created by students in the class, demonstrates two key points about the team’s design choices: (1) it shows students’ commitment to representing the debate from multiple perspectives instead of producing a story that was explicitly persuasive, and (2) students hoped the story would lead visitors to make an informed decision about whether or not to sign the petition.

The simulation requires players to physically walk along the path in order to learn more about the debate surrounding the redesign of the conservancy. As part of this experience, players encounter virtual characters who share different, and often competing perspectives on the issue. For example, players meet a scientist who shares some scientific data, and then presents his own professional opinion, as well as bikers, runners and other recreational users, who each share their own personal stories and

opinions. These virtual characters, who appear via a combination of video, audio, written text and photographic images, all represent authentic arguments and perspectives that were expressed by individuals in the community. In some cases, the characters are based on real people who the students interviewed, or read about as part of their research. In addition to meeting virtual characters, the players also receive additional data via their mobile devices, including historical images, water quality measurements and bird migration figures that further help frame the debate. Users are also directed to make observations and interact with real people they meet along the path (e.g., walkers, bikers, birders).



Figure 11. Students alpha testing the final AR simulation in the field.

Research and release event.

In addition to the AR design, students planned and hosted an event where other students at the school played *To Pave or Not to Pave*, then engaged in a discussion about whether or not the conservancy should be protected from future development. At

this same event they used pre- and post-surveys and focus-group interviews to test the impact of the design on user's knowledge of the conservancy and their opinions related to future development. The students used this feedback to reflect on their design and make recommendations for how it could be improved.

Table 11. Phase 3: Formal Design (Ramping Up)

During this phase students made decisions about the content/topic they wanted to study in more depth, as well as the primary medium/media they wanted to work with. Students embarked on the formal process of designing their final product(s) via interconnected and iterative cycles of inquiry and design.

Substantive Emphasis		Procedural Emphasis	Comments
Design Study	Identify initial goals and criteria. Identify initial constraints.	Viewed and analyzed similar designs + cases via site visits, readings, discussion. Interviewed experts.	This includes additional excursions into the community to analyze relevant designs in various contexts.
Ideation	Refine design goals, criteria, and constraints.	Generated initial ideas.	The design process and methods used to guide students design work during this time should be based on the local context – i.e., the nature of the design challenge, the instructional setting, time, etc. They should, however, emphasize key components of design-based education such as: authentic goals, skills, and practices; centrality of artifacts; ritualized activity structures; iteration; and reflection.
Refining Initial Ideas	Refine proposal and research plan. Identify additional fieldwork / research needs.	Developed research and design proposal + pitch. Got feedback on initial ideas via critique sessions.	
Prototyping / Testing / Refining	Produce and refine prototypes. Continue to develop understanding of design. Continue to develop understanding of framework (in this case contested places).	Engaged in additional iterative research + design cycles.	

The Learning Environment

A normal class period (90-minute block) during the project included a combination of the following: (1) *Large-group (face-to-face) check-in* at the start of class. This usually occurred at the school, but on occasion took place in a community setting. This time was used for large group discussions related to the inquiry and design

work we were engaged in, and as an avenue for sharing individual and group progress; (2) *Individual and small group research* where students either left the school building to conduct field work that was relevant to their design(s) (e.g., conducting interviews, taking photos, making observations, testing prototypes) or worked at the school. During field excursions, students used mobile devices (both their own and ones supplied by the project) to receive additional quests, collaborate, gather and share data, and report on their progress; and (3) *Large and small-group critique and debriefing sessions* where students shared works in progress; reflected on the project and their own learning; and participated in formal critiques.

Sample Activity Two – Design Lab

As students enter the studio they grab a seat in one of the chairs arranged in a circle, in the middle of the room. After a few minutes of side conversations and hellos, I ask for the students' attention by addressing them collectively. The noise level slowly decreases, as students turn their focus towards me. I begin by asking how everyone is doing, and we go around the circle doing a "check in." While a couple of the students choose to pass, most of us share a few words. Students' responses are pretty consistent – they are stressed because the semester is coming to end, and they have a lot of work for this class, as well as for others.

Before we break the circle, I ask students if there are any questions about the project they are working on, or things that need to be addressed by the whole group. Rochelle and Angela (who are working on a presentation that will be given at the coming public release) are the only two who jump in. They announce that they need to practice their presentation in front of an audience in order to get some feedback. I

remind them to add a critique session to the calendar on the design board, and encourage other students to sign-up, so that they can support Rochelle and Angela. I note that I also need to check-in with them because during our last class, they told me that they are “really nervous” about giving their presentation. There are no other questions. Before dissolving the circle I remind students of the upcoming deadlines related to the project. I also remind them that they need to communicate with the team if their work is not going to be ready.

As the circle breaks up, students transition to working individually or in small groups. Perhaps because we are approaching the first public playtest there is a heightened sense of energy and urgency in the room. Jordan and Cory head to the design board to see if there are any video or photography needs. They are interested in going to the conservancy, and are eager to see if their interest in getting outside aligns with the project needs. A few days earlier they returned with a great video and contact information for the project manager who is supervising several construction and restoration projects in the conservancy. While they want to get outside, I remind them of the other work on their to-do list. They decide to work on that. As a result, they set two goals for the day. First, to email the project manager they met to ask him for some additional information. Second, to edit the interview they shot so that it can be included in the final AR design. They had some difficulty earlier in the project finding where they fit in, but lately their work has been more focused and integrated into the larger project.

Rochelle and Angela begin working on their presentation in preparation for their run through. Deanna and Corrine, who volunteered to be part of the team charged with making final design decisions, have a brief conversation with Mark to help them get

organized for the day. Brandi, who is also part of that team, heads to the design board to look at the list of virtual characters that still need to be created as part of the final design. She selects one and then heads to a worktable to begin creating the text for the character. Kim, who has been studying birds in the conservancy, and corresponding with a local birder, heads to a computer in the lab to check if she has a new email. When she is done with that, she begins tracking down audio of birdcalls that can be heard in the conservancy. The team wants to add some of these to the final design.

Rebekah and Colin remind me that they are set up to do some water sampling in the creek, and sign-out so they can pick up the water sampling kit and head to the conservancy. In an earlier conversation I asked them to track down some additional data from the DNR representing water quality in the creek over time. In part, this stemmed from wanting them to consider the quality of their testing – both in terms of the equipment they were using and their extremely small sampling size. Overall, they said they were actually more interested in learning about porous concrete and that the questions about water quality stemmed from that. Since their water excursion is only going to last for one day, I decide not to push them further on their strategy. Instead, I hope that it will lead to additional conversations, and might be something they/we can build on later. In the end, they become characters in the final design, and players virtually meet them in the conservancy doing water testing. In their virtual interview they discuss some of their concerns about water quality in relation to run-off and also provide some data about the health of the creek.

When describing the classroom environment in an article he co-wrote on folklore in education, Mark Wagler (Olson & Wagler, 2012) suggests that an outsider used to

conventional teaching might view this setting as disorganized. He describes how at any given time there are groups and individuals working on their own projects, at their own speed; students "off-task"; and students acting "as if they own the place." However, he adds that there is more than meets the eye:

> An observant visitor over time will likely see what we experience, open-ended *classroom systems* that require a high degree of organization, with multiple groupings, inquiries, learning styles, projects, tasks, "islands of expertise" where students develop skills they are ready to teach each other, and students who regulate their work to include moments of playful interactions. In a teacher-centered environment, classroom systems are necessarily few, simple, visible, firm, and hierarchical. In a student-centered classroom, such systems are more numerous, complex, partially hidden, flexible, and democratic. As students develop skills and adjust to being in a different kind of classroom, the work and play begins to change from simple, short-term, teacher-guided, scaffolded investigations to complicated, longer, student-centered, open-ended investigations (Olson & Wagler, 2012).

Indeed, one of the challenges of teaching in this way is that there are many variables to account for, particularly since a key goal is to allow for emergent learning to occur. Because of this, it is important to establish and nurture consistent expectations, practices, and rituals, so that students don't get lost in the process.

Key components of the NGDP learning environment

Physical space.

The primary classroom space we used during the project consisted of two connected rooms. One room had six large round tables that could be easily broken down and moved around. These were usually set up along the edges of the room, so that the center space could be used for large and small group meetings. There was also ample wall space for displaying students' work. The second room was a computer room

with 15 workstations and a table for conferencing. We also had access to a third space that was sometimes used for breakout sessions or small-group design meetings.

The flexible and modular setup of the classroom space allowed for fluid movement between large and small group work configurations. Additionally, technology resources (e.g., projector, screen, laptops, digital cameras, mobile devices) were readily available, which made it easy for students to access "just in time" information, complete design activities, and share work without having to wait for a teacher or an assigned time to work on specific tasks.

Opening, closing, problem-solving, and debriefing circles.

Opening Circles were used at the start of class to check-in with students, present new concepts or activities, and discuss our plan of action for the day. *Closing Circles* were held at the end of class to discuss challenges and successes, share individual and collective progress, and discuss our next moves. *Problem Solving Circles* were called when there were emergent issues or needs that required full group participation. For example, we used a problem-solving circle when students fell behind schedule on their final design. Finally, to make sure that we built reflection time into the project, we held *Debriefing Circles* after whole group activities. These tended to emphasize students sharing their experiences, asking clarifying questions, and discussing what they learned. We also used these circles to conduct a brief written and oral critique of the activity that included discussion of what worked and what could be improved upon.

Circles served as one of the primary sites of collective deliberation around decisions that impacted the trajectory of the class – e.g., decisions related to the content or goals of the students' final design project. Additionally, because students

were often dispersed across physical space (e.g., during their community-based fieldwork), they also served as anchor points that helped us focus attention, maintain group cohesion, and disseminate information. Finally, they helped us identify particular students who might need additional emotional or academic support on a given day, or across time.

In their exit interviews, several students mentioned additional aspects of the circles that were important to them, including their role in building community and providing a space for them to share stories and reflect on what they learned.

> I really like that we sit in the circle and share and talk about what we've done. I think that helps everyone figure everything out. I really like it because there's some times that I get back from things we do and I'm like, I think I get it, but as I have to say stuff, I know it's right then. I like communication. It's not just did you do your homework? I see that it's did you understand it? Did you remember this part? When fun things happen on trips, it's 'Oh my gosh, when that happened?' and we all talk about it. – Kim

Students' participation levels varied during circles. We developed several strategies during the project in order to address this: (1) We discussed and established guidelines related to expectations and protocols. We consistently returned to these, either as a general reminder, or in response to particular behaviors;[10] (2) We checked with students to see whether they wanted to continue a particular discussion or return to it later. This way, they had some control over the length of circles; and (3) We frequently agreed to specific end times for circles, so that students knew how long they would last. This not only helped focus attention, but also helped us move more quickly through the items we needed to cover.

[10] An important feature of the classroom is that rules applied to everyone, including the teachers.

Open design lab.

The majority of class time was devoted to open lab time, where individuals and small teams completed their design work. As teachers, we made ourselves available on an "as needed" basis during this time. We also circulated in order to informally check-in with students to see how the project was going for them and to provide them with formative feedback on their work. While there was unstructured time for students to work during open lab, this time was bounded and supported by more structured activities such as written action plans, reflection, and critique sessions. These are discussed in more detail below.

Field experiences.

Field experiences were either coordinated by the teachers as a whole group activity or by individual or small groups of students based on their research and design needs and interests. Full-group field experiences were structured around an activity that we developed (e.g., the contested places activity described earlier), while student-generated field experiences stemmed from students' personal research and design needs (e.g., going out to do interviews, take photos or video, or test their AR design).

One of the key goals of field experiences was providing students with a context for applying the concepts and inquiry methods central to the project. For example, students developed their interviewing and documentation skills through cycles of fieldwork, debriefing, sharing, and reflection. While we provided some initial direction, most of the instruction related to fieldwork was either delivered in situ (e.g., while the students were in the field), as part of presentations (e.g., when students shared their evidence or documentation), or as part of debrief circles.

One student describes the move from talking about a concept in class to being able to apply it during a field excursion.

> I remember the teacher talking about [contested places] and I was like, 'what is going on? What is this word?' . . . We got into it and I didn't understand it at first but the slideshow and the pictures helped. And as I was looking at the pictures and they were talking about them I understood them more. Then, when we got to go around town and actually apply it . . . The fact that we got to take pictures and say, 'our contested place is this and this' . . . we got to apply what we learned. It really clicked when we went down to Middleton and took pictures . . . it really helped me understand what it was. – Kim

Students consistently mentioned that leaving the classroom in order to do research in the community was one of the best parts of the project because sitting in class was "less interesting," "less hands-on," and "less relevant." One student said, "we could actually go and look at it instead of just researching it in class." Another said:

> I mean like even giving us the freedom to walk around just made it so much better. I don't do good with just sitting looking at a slideshow. But actually getting to discuss and talk and walk around is a twist, and it makes it a lot more interesting . . . We can like, leave the building, like by ourselves, and you trust us. I mean freedom is like a huge thing because if you're restricted… everyone's going to like learn the same thing, or not learn anything. – Corrine

Open door policy.

One way we supported students' fieldwork was by developing policies and procedures that allowed them to leave the classroom and school building during the class period. Students could leave individually and in small groups, but they were expected to develop a brief plan of action before they left, checkout via the design board, and share evidence of their work when they returned.

Formal design practices.

A key goal of the project was to develop students' knowledge of, and ability to apply, formal design processes and methods. Because of the relative short duration of the project, we decided to emphasize four aspects of the design process: (1) developing and using material artifacts as resources for sharing ideas (e.g., storyboards); (2) creating mock-ups and prototypes that could be used to get feedback; (3) using effective processes and methods for soliciting and giving feedback; and (4) using short iterative cycles to modify targeted aspects of their designs. We also introduced the students to the concepts of experience- and user-centered design.

Critique sessions.

In addition to providing each other feedback on our design work, we used formal critique sessions as a way to reinforce the concepts and practices associated with iterative design. We established deadlines for critique sessions as a way to put time constraints on students' work (which was also a design strategy we encouraged them to use by themselves). Critique sessions helped make transparent students' understanding of design and the design process, and provided opportunities to assess their understanding of the underlying concepts we were studying.

These sessions also helped cultivate collaboration between students and provided an opportunity to discuss and practice giving and receiving feedback. As part of critique sessions we communicated our belief that we had a responsibility to support each other's work and provide meaningful feedback.

> I feel if everyone does something and you go, 'Oh, good job. That was amazing!' It's like, let me hold your hand, you're doing so well. We want to grow. We want to do better. We want to make a game better. We want to learn more about something. If everyone just goes, 'good job,' you stay there. You don't grow as a

person, as a learner or anything like that. If you give real critique with, ‘Oh, you did a good job, but I think you could add this, or you could maybe take this out of it, or put these two questions together.’ Because of that our product will grow and we will grow. – Corrine

I was definitely the person [who said], ‘Wow that’s really good! Good job!’ Then when people were doing that to my project, I was like, ‘This is annoying. I would really like to make this a lot better but no one is giving me anything.’ When I was asked to look at things, I was really sincere. I was like, ‘This looks really great so far.’ Things that I think you could add to it to make it better are this, or right here this could be changed if you like that idea better. I really tried to give as much positive good feedback to them as I could. I wanted some in return. – Kim

Project design board.

The design board served as a central location where we posted and collectively organized our individual work into a coherent whole. We also used the design board to share resources and ideas with each other and keep track of design tasks that needed to be completed – these ranged from large (e.g., we need a team to conceptualize and create the introductory video) to small tasks (e.g., we need a specific audio clip or photo).



Figure 12. A section of the design board near the start of the project. The documents along the bottom are some of the initial articles and reports students read as they began to seek additional information about the conservancy and the debate.

The design board served as a key site for emergent design conversations – i.e., many impromptu discussions took place around the material artifacts that were posted on the board and as a space where students could capture and share their ideas with others. One student commented:

> I thought that [the design board] was a good idea – like how you can put a little post-it note up if you have a new idea. It's kind of like everybody can see what you're thinking. It's not just, you keep your thoughts in your head and nobody knows what you want to do. I mean it's like sharing new ideas and it's also better for planning, for [designing] the game. – Kate

> I didn't really use it that much. Except that me and Deanna put our surveys up there. Which was really nice because both of us will forget things at home. So, it was really nice to have it – to leave it there, and we know that it is going to be there. But, I know for a lot of other people it was really nice because they could put their stuff up there and that was a way for other people to look and see what they were doing. And I think it helped putting everything up there to see, 'alright do we have equal opinions so that they are not biased?' Like, we could really read and look and see. Like, we could come in the next day and we would start right where we left off. There was no okay, 'what do we do here? What do we do now? We need to set it all up again.' It felt much more like it was our place, and not just a classroom. Like it was our workplace. And I don't know, it was like a weird feeling, but it just didn't feel like a classroom. It felt like we were doing something bigger. It kind of made me think of like a newspaper. You know, because they have everything all up. At least that's the feeling I got from it. – Corrine

The design board also proved useful in that it helped students manage their workflow in relation to the overall project.

> We're all working on different things and if we need information for someone else you have to talk to them and leave your space and leave your work set-up. If that board is there, you don't have to interrupt them, you can go up and look. Each day people will ask something and it's like ok this is what I did yesterday; someone has added to it. This is the new information. These pictures were taken from here. This is a map of the place. These are the people we've made already. It set everything up. What we had so far, what we were working on was up on the board. There were different sides to different topics. You can use those things to get inspired to work on your next thing. Should I finish this? Should I work on this? What should I do it on? Go look to see what we've had already, what needs to be done. – Kim



Figure 13. Corrine adding content to the design board.

Design task cards.

In order to help manage the workflow, we kept track of tasks that needed to be completed via *Design Task Cards*. As new design needs emerged we developed cards and posted them to the design board. For example, when students authoring the final version of an AR game via the game editor realized they needed a new photograph or video clip, someone wrote-up a design task ticket and posted it to the *Project Design Board*. Other students, in turn, grabbed the ticket, completed the design task, and delivered the final product to the editors. This system helped us balance the need for differentiated scaffolding and the desire to provide students with opportunities to generate their own learning trajectories. Within this system, students who preferred a specific task could select a card, while those who wanted to follow a particular interest or needed less structure could more autonomously organize and manage their own learning. The mobile devices helped with this process in that students could easily

share images, audio recordings, etc. via the phones. In addition, they allowed communication back and forth between the designers in the studio and the students doing fieldwork.

Design journals.

In addition to text messages, emails, and face-to-face conversations, we used design journals as an avenue for maintaining an ongoing dialog with students. Design journals proved important in that they allowed us to gauge students' conceptual understanding, check-in on their progress, and answer questions. The journals also provided a space for students to reflect on their progress and set learning goals.

Distributed knowledge.

While all of the students were expected to develop an understanding of the core concepts we were studying (e.g., contested places, iterative design, etc.), not all of them were expected to develop the same knowledge or progress at the same rate. Instead, we used a model where individual students could develop expertise around a particular concept or skill as the need and interest arose. This helped cultivate a collaborative learning environment, where students not only helped teach each other, but also became dependent on one another for the success of their individual and collective designs. It also opened up space for students to follow their own interests and design their own learning trajectories.

Dispersed community.

As teachers we did not have the expertise students needed in order to understand some of the questions that interested them. As a result, when students had

questions about much of the content, they could not turn to us for answers. They could, however, turn to us for support in finding answers via online research and/or contacting community members with the requisite expertise. We used this as an opportunity to model how to engage in locally focused research. We also used this as an avenue for encouraging students to take on more responsibility for their own learning. As part of this process we made efforts to facilitate and encourage students to make connections to people and resources outside of the classroom. In some cases, we connected students with community members, while at other times students located their own resources. This occurred via scheduled visits or impromptu interviews in the field, and email correspondence. Most of the experts and community members we connected with were not part of our pre-existing network. Instead, our network expanded based on our needs and interactions. Another way to frame this is that one of the outcomes of the project – one of the things we built – was a network of resources. Some of the people in this network have been involved in subsequent projects.

Mobile devices.

Students were encouraged, but not required to use mobile devices in order to support their field investigations. Throughout the project, we employed a hybrid model that combined the use of students' personal mobile devices (i.e., devices that the students owned and voluntarily brought to school) and devices provided by both the school and the research team. The devices provided by the school/research team were available to students for extended use (e.g., overnight, for a weekend or for weeks at a time).

By providing students with access to mobile devices and allowing them to use their own devices at school, we hoped to create an environment that bridged the classroom and the broader community, while also leveraging the students' interests outside of school and experiences using these devices. As such, we were interested in exploring the potential of mobile devices to support a learning environment that was fluid in terms of where and when learning took place – i.e., a learning environment that supported learning across contexts, allowed for individual and emergent (yet scaffolded) learning opportunities outside the bounds of the school building and allowed students to develop skills, language and conceptual understandings that were situated in a "real world" context.

Authentic inquiry, products and processes.

In alignment with place-based education, the project attempted to engage students in doing authentic work – work that involved "real world" roles, practices, processes, audiences and products. One theme that emerged in this area was the relationship between students' motivation to complete work and their perception that their work was "authentic." Students perceived that their experiences during the project were authentic for a variety of reasons, including: (1) they felt their investigations and design work were relevant to the community; (2) there was a "real audience;" (3) their work involved "real world" concepts, skills, and practices that were tied to a career they wanted to pursue in the future; (4) the classroom resembled a work environment and did not "feel like" a school setting; (5) they got to leave the school building and take on different roles and identities (e.g., researcher, consultant, photographer) as they interacted with the community; (6) it prepared them for being independent learners in

the future; and (7) it allowed them to follow something they were interested in learning more about.

> Sitting down and discussing what we wanted to do. Discussing how we were going to get this done. Like, the whole design aspect of like, putting things up on the boards. You know, going off into different groups and doing separate little things. One of the things that I am looking at being is an illustrator and that's a lot of communication. A lot of storyboards and pictures and visuals and talking and groups. So, that kind of gave me a taste of what I might expect for my career in the future. – Corrine

> It's not like we're learning this skill [for] today. It gives you a fun, in the moment project that is going to teach you something that is going to stay with you. It's planning out things. It's designing things. It's being creative and putting ideas together. You're taking ideas. You're taking facts and putting them together. It's something you're going to use the rest of your life. If you have a job and making a proposal for something, whatever you do there is creativity and there's facts and responsibility. There is learning and adapting to different people and different environments. – Kim

Students were also motivated by the fact that others outside of the classroom used their designs. Designing for an authentic audience deepened the design experience, increased students' engagement levels, and motivated them to care about the quality of their work. While they expressed this sentiment in their post interviews, it was also evident in their conversations and behaviors leading up to the public release of their AR simulation:

> I think that for a lot of kids they tried a lot more because they knew other students were going to see [their work]. If other students are not going to see it, they tend to not care as much. I know that I don't. Like, for an example, I do a lot of art and in Mr. Elland's class we do critiques, and if we did not have those critiques I probably wouldn't work as hard on some of those things because I know that nobody else is going to see it. But, if other people are going to see it you want to be at least somewhat proud of what you have done. – Corrine

> Well it kind of got other people's attention when it came to what was going on down there [in the conservancy] and they learned a little more. . . maybe after they played that they wanted to get involved or paid more attention to what was going on in Pheasant Branch. – Jordan

> I was really excited walking over to the school [on the day of the release]. I was wondering how people were going to react to it – if they were going to be into it. Was all our work really worth it? Are they going to enjoy it? We went through it and they went down [to the conservancy]. When everyone came back it was fun to talk to them. Was it fun? Did you run through it? Did you learn something? Then have that conversation if you were going to sign the petition? Then, why are you going to sign it? Didn't you hear this? Didn't you read this? Then, talk to them and see if they got out of it what our purpose was for them to. – Kim

The Centrality of Place and Democratic Participation

In this section I explore some of the key themes that emerged in relation to students' learning experiences and overall perceptions of the project. While they do not capture the project in its entirety, I chose to focus on these particular themes because they are associated with key components of Place-based Design – particularly, its emphasis on deepening students' connection with their community and developing learning experiences that promote democratic participation and civic engagement.

Place: Connecting with place

One of the key goals of place-based education is cultivating students' connections to their local community. In observing and interviewing students we found that this occurred in the Neighborhood Game Design Project in several ways: (1) students' inquiry and design work led to an increased awareness of places and issues in the local community, and (2) students' experiences during the project led them to care more about local places and issues.

Considering that the project was developed and implemented using key components of place-based education, it is not surprising that local places played a central role in students' experiences. Local places provided the content we studied and multiple contexts for applying key concepts and skills. One of the primary methods for

engaging with local places was through fieldwork and place-centric design activities. Together, these activities encouraged students to take on new roles and identities; use new tools, lenses and language; and interact with people and places in new ways. In turn, they also impacted how students discussed, related to, and reflected upon their community; and worked to interrupt (at least temporarily) the patterns and boundaries they had previously established in relation to local places.

Place: Raising awareness

The Neighborhood Game Design Project provided a context for exploring the downtown area and a local nature conservancy, meeting and interviewing community members and government officials, and accessing locally produced media (e.g., locally generated digital and print resources, such as blogs, government and non-profit publications, and local newspapers). One result of these experiences was an increase in students' awareness of people, places, and issues in our community. Some students expressed their increased awareness in a general sense, while others tied it to specific places or issues:

> Before this I didn't notice anything. Now after this class, it's like there's a lot of local issues that are like, invisible. Nobody notices at all. And it's just like that's why they don't change, because nobody says anything about it. – Deanna

> Yeah, I learned a lot about issues and contested places – like parking. And I learned a lot about just downtown in general, and what people think about. What their perspectives and opinions are. And like, I didn't know there was that many issues downtown really. – Kate

> I knew there was a trail that my friends go on and they walk on from their houses up to the school. I didn't know it was getting paved. I didn't know anything. So, this project really taught me pretty much everything I know about Pheasant Branch [Conservancy]. – Kim

> I thought [the conservancy] was just the part behind our school and across the street, and then I learned that it goes all the way over Century Avenue . . . and I learned a lot of ways that people use it, like biking and stuff. – Rochelle

> If I ever go walking up in the conservancy I'm going to think of this class because like, 'Hey, we talked about this stuff.' Like, even the designing of it and stuff, we got involved with it. – Angela

In part, students' increased awareness stemmed from the interplay between the inquiry and design activities they engaged in, and the conceptual frameworks we encouraged them to use. In particular, we discovered that *contested places* had traction with the students and proved useful as an entry point for engaging them in studying and reflecting on their community. It also proved generative in that it encouraged students to explore places and issues from multiple perspectives and ask questions they may not otherwise have asked.

After the project ended, *contested places* continued to serve as a useful lens for discussing particular places or issues. For example, students continued to point out contested places and issues around the school, and we used it to frame several discussions where there was disagreement regarding the use of a particular room, or a specific school policy. A few students told us that they used the concept of contested places in other contexts outside of school. For example, one student described how she used it in conversations with her parents:

> I talked to my mom about [contested places] in the car. We passed something and I said, 'That's a contested place.' Our basement is kind of a contested place right now because we're redoing it. My mom wants one thing done to it and my step-dad who is actually building it has a different vision. I always joke, like guys I'm going to the contested place for a little bit. I taught them what that was. Arguments, different sides, not a place but the idea itself is contested. I find myself when I hear something and hear an argument I'll think, 'contested.' I can put it into my everyday life now. – Kim

Place: Caring about

In addition to simply raising students' awareness of place, the project also led students to care more about local places. For some of the students the project provided an entry point for caring about a particular issue or place. For others, it amplified pre-existing connections or emotional attachments with a particular issue or place.

> Now that we've studied [the conservancy] I care a little bit more about it. Just because now I know about it, and like we designed something to have to do with it. And we learned a lot about what everyone thinks about it . . . and I think that I know a lot more about the issue. So, it helps me understand it more, and in the future I'm still going to probably look back and see like, you know, do they pave [the other parts of the conservancy], or do they not pave them? - Angela

> There are not as many open areas, like that haven't been touched at all by society. And I think there should be more. And I mean, I know obviously there were people walking around Pheasant Branch, but I enjoy – I personally like things to kind of stay how they were in the beginning instead of trying to change it. I like the nature better than actual man-made places. – Jordan

> Well, I was always interested, and I think this class made me more aware of stuff. Like, I didn't think about anything like that. Not like, a more in depth understanding . . . I just walked by and would be like, 'oh well,' before. Now, it's like I can actually do something about it, something that needs a change. – Kate

Students' sense of care increased as they learned more about places and issues. As a result, this encouraged them to go beyond surface investigations and generalizations. Some students also reported that the project got them interested in learning more about the local community.

> I've gotten involved and learned about something and I would like to know what else is going on. I don't want to just go from home to high school. I want to know for kids who do live here and be able to talk to people about it and learn about Middleton as a community itself. – Kim

> I learned stuff like its been a nature preserve since the 1960's. I kind of like facts like that about stuff, especially in like my hometown, like the place where I lived my whole life. Where I should know this stuff, you know. Like when we run around Middleton with my grandpa and stuff. He knows like everything. Like

> when this building was built, what it was for type of a thing, because he has lived here for a long time. – Deanna

Paying attention to the range of issues students care about – and why they care – is relevant for a number of reasons: (1) It serves as a reminder that youth do care about their local community. While this might seem obvious, it runs counter to some of the assumptions adults, including teachers, make about high school students, particularly ones who have been labeled as "at-risk." (2) It can be useful in identifying questions, issues, and challenges that students might find engaging. When decisions about curricular content and areas of inquiry are determined and managed solely by adults, it reifies what some of the students expressed at various points throughout the project - i.e., "people don't care about our perspectives." In this specific case, we would not have discovered that students cared about the conservancy, or were invested in studying the impact of developing the path, had we not taken time to listen to their perspectives.

Place: Valuing local studies

In concert with the previous discussion related to students caring *about* local places, we also found that students expressed interest in, and cared about *studying*, local places. The reasons for this ranged, but included perceptions such as: it's easier to make a difference when focusing on local issues; studying local issues provides more opportunities for active and "hands on" learning; and local studies provides a context for doing field work, which allows you to apply what you're learning versus "just talking about ideas."

> I think this is a lot of fun for me because it's more local. You can actually do something about it. It's not like a worldwide thing. You can like call up the

> president and be like, 'blah, blah, blah' and whatever. But I mean it's like you can actually do something about this. Like even signing a petition is getting somewhere. That's what I like about [studying] Pheasant Branch. It's like there's a lot of stuff you can actually do about it. – Kate

> People think that [local issues] are not as big a deal as like global issues, but they really are because every community has an issue. I kind of think they can contribute to a global issue, 'cuz like that's what they're saying with global warming, pollution and stuff like that. Every community does its own part and that, and I think learning about local issues can help solve global issues. Also, if you can solve the local issue first [then] it's like taking a smaller step to a bigger step. – Jordan

> [We're] dealing with local issues that are happening now, instead of like, you know, a long time ago. We're dealing with stuff that we could still change. Instead of stuff that already happened. And just with local issues in general, like well, since I'm living here now, I kind of want to have my area – I don't know the word, but like maybe protected, sort of. Kind of like defending my own area. – Rochelle

Democratic participation

In this section I briefly discuss three key themes that emerged in relation to democratic participation. First, as a result of providing space for them to shape their own learning trajectories, students developed a sense of ownership over the learning environment, as well as the media they designed. Second, the project provided opportunities for students to share their voice by participating in civic discourse, both inside and outside of the classroom. Third, perspective recognition, a core skill associated with democratic participation, emerged as an important part of students' inquiry and design work.

Choice, voice, and ownership (in relation to the course trajectory).

As a result of having opportunities to share their perspectives, and help make decisions about the trajectory of the project, students felt a sense of ownership over their learning. In some instances students' voices were included via formal processes

such as decision-making circles, or written check-ins. In other instances this was done informally by observing students or engaging them in impromptu conversations where we asked how the project was going, or what they might be interested in exploring or doing next. One student described our approach like this:

> It's not a set in stone environment. It's a class that can really adapt. It's not, 'we do this every year.' You look at the kids. You look at what you have and you go from there. You create projects and you create a learning environment. You help them learn the same things you would learn each year, but specifically to them... Why shouldn't there be an environment like that? Kids say school is so boring. And [they] get up and say, 'I don't want to go to school.' You want kids to get up and go, 'oh my gosh I have this class today and we get to do this,' and go home and tell people about it, and be excited. That's what most teachers want for their class and for their students. I feel this class has really done that for me and for our other classmates . . . It's not read this chapter and do this assignment. It's let's talk about it. How do you feel? What do you think? What do you guys know so far and then what can we teach you? This is what we've learned and now we know this, now what can we add onto that. It kind of grows and grows. There's writing but there's also talking as a group, talking individually. - Kim

One strategy we used to encourage student participation in shaping the project was discussing the project itself (e.g., the content, activities, trajectory, learning environment) as a design that was open to critique and iterative refinement. For example, we openly talked about the design choices we made as facilitators when designing the project and associated learning activities. In turn, the students critiqued these designs – allowing us to both improve the current project and re-design future iterations. By inviting students to critique *our* designs (including the learning project as a whole), we hoped to model the design process, cultivate a culture of experimentation and critique, and responsively alter and improve the design of the project to meet their needs. Many students referenced this goal in their journals and exit interviews and said that these ongoing discussions made them feel like they had some control over creating

the learning environment, determining the learning activities, and co-building their own learning trajectory.

This is not to suggest that students always agreed on topics and designs, or that the decision making process was conflict free. On the contrary, it was not uncommon for the whole class, or smaller groups of students, to confront conflict when negotiating rights and responsibilities, choosing topics of study, and making design decisions. One student mentioned this as one of the most challenging parts of the class:

> I think the hardest thing [about the design process] is trying to get a mutual consensus with a lot people. You know one person wants to do this, the rest want to do this. It's like, 'What do we do to make it in the middle?' – Jordan

As a site of democratic practice, the classroom – which includes places in the community – was frequently a site of contestation, as students, teachers, and community members deliberated, worked to understand conflicting perspectives, and made shared decisions. Though design experiences characterized by choice and ownership were messy and often time consuming, they were a critical component of the project because they provided opportunities for students to engage in, rather than simply talk about, democratic practices.

Choice, voice, and ownership (in relation to personal learning trajectories).

Not only were students involved in co-designing our collective learning experiences (e.g., by helping decide the places and issues we studied), they also had opportunities to manage their own learning and pursue personal interests. While some of the activities we engaged in were pre-scripted, particularly at the start of the project, we consistently attempted to build in opportunities for students to follow their personal

interests and create their own learning trajectory. This was amplified during the final design project, where students had freedom to develop and follow lines of inquiry and design that were of particular interest to them (as long as these fell within the scope of the project).

> I liked it because it is more open to learning about what we want to learn about and are interested in… I like being able to choose what I want to learn about because I don't have time outside of school. – Deanna

> It wasn't like should I do this and it was yes or no. It was well you could do this or maybe sit down and talk about it. We could do this or if you're interested in this aspect more than this. You guys didn't give us a yes or no. It was, you have options. That helped. It wasn't like, 'I have to do this and I have to do this.' It was like, 'oh, this is fun,' I *could* do this. Or, I'm done with this, and I can move onto this aspect of it. – Kim

> We were given the option to choose what - basically, like this whole thing. Like, what we wanted to do. Like, we got to choose it, and that really engaged me into wanting to find out about it. Because it's like . . . this is what I want to do – I want to learn. As opposed to – if we were just given the same thing and we were supposed to make an AR game on the Boston Tea Party – I probably would be bored, and I would not want to do it, and I would be lazy. So, I think it is all a matter of getting to choose - getting the option to choose what you want to do. Like, we had kind of like a baseline, but we had a lot of freedom too, and that is something that we don't normally get in school. – Corrine

Some students leveraged this autonomy to focus on developing a particular skill or media practice, such as video production or game design, while others studied a particular topic or issue they found meaningful. One student used this as an opportunity to further explore his interest in photography. Another student who was interested in learning more about birding used the AR design as an opportunity to investigate local bird populations and migration patterns.

Many students discussed the relationship between choice and increased engagement. For example, they provided examples where being able to follow personal

interests deepened their sense of ownership over their learning, and led to increased care about the quality of their final designs:

> It's always fun to collaborate and talk to everyone, but if there is something specific that you like to do, and you're very interested in and maybe no one else has that kind of passion about that subject as you do. If you can go off and learn about it and do projects on it and get information and then bring it back and still help the main group, I think that's a lot of fun too. It's not just all talking with the group and being as a whole group or little groups. It's just you and you get to work at your own pace. You get to plan out your day and how you're going to separate things. I think we have a really good balance of that because we've been doing a lot of group projects and then we got to do our individual. I really liked being able to have some time to be able to work on just what I wanted to. – Kim

> Being able to do something I like on a project we're working on made it more fun. That made it easier to actually get it done. I think it would have been harder if you assigned it and said, 'you have to do this, you do this, you do this.' Again, the more freedom of choice is important. We had quite a few options laid out in front of us and we got to choose which ones we wanted to do. – Jordan

Not surprisingly, students referenced choice and ownership when comparing the Neighborhood Game Design Project to more typical school-based learning experiences. One student described how this differed from other courses she had taken:

> [With other classes] there are parts that I'm like, alright, I've got to do the homework, take the test, memorize these facts, regurgitate them back to what the teacher said. But with our class, I like that we talk about what we want to do next. We interact with each other. We work with groups. With our last project, we could all go off separately and then we could bring it back. We can also work as a group and communicate as a group. Whereas, in my other classes that I've had it's been here's what we're doing, here's next, next week is this, this is your homework assignment. Occasionally go into groups and do a project, but it's like a big poster that you stand up in the classroom and this is the picture that I found. It wasn't as engaging for me. – Kim

> We are engaged in activities that are more interesting to us. Like, we had a big group discussion and we decided like [the conservancy] is what we are interested in. That's what ***we*** [student's emphasis] were interested in. That's what ***we*** wanted to do. So, I was more engaged because I wanted to find out about it and I wanted to know what - I mean why they did it. . . a lot of time schoolwork is so biased, and we are only given like one opinion, and that's the only opinion we

> are given. And this time we got to choose the opinions. We got to look at them. We got to decide which opinion was ours and not whether it was right or wrong. It was not like, 'I think this way, but I am not allowed to put that down because that will be counted as wrong.' – Corrine

While students were eager to have more choice, they were also willing to accept additional responsibility for the decisions they made. One of the common threads that ran throughout the project was students' sense of responsibility in relation to having some control over their learning trajectory:

> We are allowed to go and we don't need to have a supervisor directly looking at us at all times, and that we are trusted to do what we are supposed to do. [Usually] it is like, we always need to stay in our little group, and we need to follow the exact things that everyone else does. And it's just more – it's a lot more freedom and it kind of makes me want to be able to prove that we can do these things. – Corrine

> [The teachers] were just kind of there to guide us, and like, teach us the things that we couldn't teach ourselves. So, I like that. I like classes like that. It just makes me feel like I can learn on my own you know, and I don't need to like, depend on an adult figure. I mean I'm an adult now and I want to feel like an adult . . . I think it makes us independent. You know, able to make our own decisions and grow up kind of. Because I think high school kind of makes us feel like kids longer than we should be . . . I felt like I could do what I wanted whether it was the right decision or a bad decision. And if I did the right decision I would be rewarded you know. Well, not rewarded, but rewarded with an end product, and like getting things done. And if I made a bad decision, then I knew my consequences, and we wouldn't get things done, and things wouldn't turn out. So, you have to kind of think of rewards and consequences when you make decisions like that. – Deanna

Another way students discussed responsibility was in relation to the team:

> I feel my part was going into a final product. It was going into something that everyone has been working on. If I'm that person who didn't work, it affects our group. If we're giving this [game] to someone else to play, we want it to be good. We want it to be the best we could have made it. If I'm the one that is slacking off then that is what is going to be lacking in our final product. I feel because I knew there was a group and I knew there was a purpose that I had to step up to the plate and make sure I had my folder with me, and I didn't leave this here, and I made sure this came with me, and things like that. – Kim

For some students, there was a sense (which was probably accurate and based on prior experiences) that their choices would be reduced if they abused the opportunities they were given:

> It feels like in this class we don't have to be - our hands don't have to always be held. Like, we have the freedom that most classes don't give us… They would never just send us out downtown, and let us play a game. Like that would never, ever happen. So, it makes you feel, like more responsible for what you are doing, and you want to be able to prove that, so that you can continue to do those things. – Corrine

> [If you abuse the freedom] it's kind of showing it's too much – this kind of class work shouldn't be done . . . If you abuse the privileges then it's like, it could still be taken away at anytime. And nobody wants that. It'll ruin in it for future classes maybe. Like, then others miss out on an opportunity to take a class that they would enjoy. – Jordan

> Well, for me, I wouldn't take advantage of it. I'll probably do what I'm supposed to do so that, you know, it won't be like, 'Okay, you did something wrong. You can't do it anymore now.' So, I would do what I'm supposed to do, so I could be able to get outside of the building. I don't know. I think a lot of the kids in our class will be able to do what we're supposed to do. I don't see anybody taking advantage. So, that was good. – Rochelle

While students emphasized the importance of having choice this does not mean they always chose actions that helped them progress on their work. While we intervened when students were consistently off-task, our emphasis was on shifting our interactions away from micro-managing students' behaviors toward encouraging them to take on more responsibility for their individual and collective progress. The scaffolding we developed, including the rituals and practices discussed above, supported students' transition in this area. For example, our use of time bounded design and critique cycles in coordination with touch points, such as circles and journals, provided a balance between students' open work time and the need to help them organize and regulate their own learning.

For some students, one result of challenging them to take on more responsibility for their learning was a sense of accomplishment when they completed work:

> Even as frustrating as it was - I really liked making the game because it was something that we did, and then we got to share it with others and then others got to do it. And like normally teachers make the game and kids play. And in this class we made the game and then other students, our fellow students played it. So, I really liked that. It was a lot of work, but we kind of proved that we could do that. Like, we could follow through and get everything together. – Corrine

> I think probably the biggest thing was the feeling of achievement. I guess when we did the, you know the final read and the day after. I was kind of relieved just because I was like nervous to the whole thing because I wasn't sure how it was going to turn out. But I think that I was kind of happy with myself especially because getting up in front of people and talking is probably one of the biggest things for me I guess. – Angela

Relationship between voice and design.

Another theme tied to democratic participation is the relationship between student voice and design. This relates to both the final products students designed, and the interactions they had as part of the design process. Students' design work fostered new interactions with people and places in the community, and created a context for them to share their own stories, opinions, and perspectives on community issues. For example, by designing a game about an issue that was important to them, and included their voices, students felt like they were able to engage others in conversations about the future of the conservancy and "push back" against the city.

In some instances, this expression of voice arose from students' perception that youth were often excluded from decision-making processes. In response, students approached their design work as a means to educate other youth about local issues and include them in public discourse. In design meetings students often referenced youth as the ideal audience for their products. They believed their designs were educationally

relevant to their peers and capable of shaping present and future perceptions of contested community issues.

The relationship between voice and design was evident for one student who worked as a videographer on *To Pave or Not to Pave*. Reflecting upon his documentation and media design the student, Jordan, discussed how the project provided an avenue for sharing his perspectives directly with the city administrator and other community members:

> Pretty much our entire classes' opinions got heard because we discussed it with the city administrator. And then emailing people about it or emailing the city administrator and actually talking to people in the conservancy. Like, they'd say their opinion and then you could say yours, and I did a couple of times, and I know that my voice was heard.

Jordan's growing fluency with video further amplified his voice; his video work facilitated contact with additional community members and resulted in media that was included in the final version of *To Pave or Not to Pave*. His experience exemplifies a confluence among voice, design, and place. As he developed an interest in local places he used media design to share his ideas, which in turn further immersed him in the community. These interactions also increased his awareness of local places:

> I have been kind of paying attention to [the conservancy] more, and other local issues, like downtown Middleton with the cracks in the sidewalks. Ever since Mike Davis started talking about that I'd start looking at cracks in the sidewalks as I walk in, and it kind of makes me more aware of what's going on.
>
> I never really thought about anything before … I'd go to the skatepark and home and work and that was it. And now it's got me more interested in learning about local issues. I don't think I ever would have thought about [the conservancy] though if I hadn't taken this class. – Jordan

A similar relationship emerged between students' increased knowledge of an issue and their level of comfort advocating for a particular position:

> I think I am more comfortable. Like, with what we are talking about . . . I have a very strong opinion about it and I am not afraid to share it because . . . I guess since I researched it, and like dug into it, and I know exactly why I think my opinion is right, or why I believe in my opinion it makes it easier to discuss – because I have things to back it up. As opposed to being just like – 'Oh, I don't like the paved path because I don't like it.' – Corrine

The examples students cited for feeling that their voice was heard in relation to community issues, included: being able to talk directly with Mike Davis, the city administrator, and share their ideas with him; engaging with other students and community members as part of the design process; building the AR experience for others to play; and developing and handing out the petition.

New perspectives, multiple perspectives.

While students perceived that their design work provided an avenue for sharing their perspectives, it also developed their understanding of other people's perspectives. As a result of learning more about the debate, and related issues and tensions, the project challenged students to recognize the nuances of local civic issues, and that they were more complex than they had originally thought. Some students described how the project increased their knowledge of the conservancy and helped them develop informed opinions:

> I was really interested in both sides. I really wanted to know everything that I could to make as educated a decision as possible. – Kim

> Like if we were to have just found out like this path was paved and we did not study anything locally about it all of our opinions would be very, very biased. We would not think of, 'well, there could be good things about it." Like most people would just automatically assume, 'why did they do that?' And since we studied it,

> and we learned locally, and we talked to Mike Davis, and we communicated with the community, we got to be closer to that subject and got to feel like we – not really like we changed anything, but like that we now have more of an understanding. – Corrine

In some instances students' design work challenged them to reflect upon their own perspectives, question their assumptions, and even change their opinions – all practices that develop a disposition towards perspective recognition. In part, the emphasis on multiple perspectives resulted from our use of contested places as a key lens for exploring our community. This was amplified during the final AR design project because the students decided to produce an interactive story that was "more neutral" rather than persuasive – i.e., they wanted to design a final product that represented multiple perspectives and honored a plurality of voices. As a result, they had to actively seek a range of opinions and perspectives as part of their inquiry. In some cases, this forced them to consider perspectives they had previously ignored or did not agree with.

> I didn't really think about the different aspects like the environmental things such as runoff and washout. I didn't think about those at all. It was more like runners and bikers and I didn't think about accessibility at all either, like people in wheelchairs or strollers. I didn't think about any of that. – Jordan

> It made me like more open-mined about different things. Like, I'll just take Pheasant Branch [Conservancy] as an example. Before I was just like, 'I don't like the paving'… And then it's like, I know I can have my own opinion, but now I can see other people's sides, and like why they don't agree. And it's like, now it's more – it's clear to me like why people have different opinions. – Kate

As students imagined how different users might see the controversy, some of their initial opposition towards development softened or changed. As evidenced by the

following quotes, learning content associated with multiple perspectives informed students' opinions as they proceeded through the design process:

> [I] wasn't thinking about how you know, handicapped people could get around or that maybe bikers should be able to go through even though some people are talking about how it scares away the birds . . . so now, I'm kind of like in the middle. – Angela

> Well at first I was like, no they shouldn't do it at all. If you don't like it go somewhere else which in a way I still kind of am but I understand what they mean look like accessibility and stuff but I was also concerned about like the runoff in the water coz it goes into the lake and I've always been like I've always – my family is always gone out on the water, boating and fishing, knee boarding stuff like that and where I used to live the lake was pretty gross. – Jordan

> I came in very opinionated. Like, 'I hate this.' 'I hate this paved path.' But, it was interesting to see why it could be good. Like, I understand now that it still can be good for like wheelchairs and strollers. Like, that's a lot better for them. Like, I still don't want the path. But, I mean there are good things about it not just bad things. – Corrine

> I was against the path for a while because I only heard people in our class saying 'it's ruining this,' 'it's going to do this', 'it's going to do this.' Then I heard people for the other side, and I was like, 'what am I going to do? I don't know any of these opinions or anything.' I read articles and stuff and as I was reading it, they were making really good points. Originally I felt no trail whatsoever, but I really like the new pavement we have now because bikers use it. There are more people down there. – Kim

The same student reflects on how her opinion changed as she read different perspectives:

> I read that article about the biker. He said, 'No, it's easy to pick on bikers because we're a minority.' I read that article and it was talking about birders against bikers. I've been learning about the birds and I finished that and I was like he makes such good points. CO^2 is from cars, but if you're biking to work you reduce that and you're helping the environment. As I was gathering information, at the end of the article, I was like this really isn't as horrible and life threatening to the animals and the environment as everyone makes it seem. I was like, 'Maybe this path could be good for us.' – Kim

CHAPTER FIVE: CASE TWO – EVERYDAY ART PROJECT

In this chapter I present the Everyday Art Project, a combined art and social studies intervention I co-developed and implemented in collaboration with Robyn Acker, an art teacher at our school. As part of the project, students documented "everyday art" and artists in their community, and then co-designed an exhibit at the Madison Children's Museum to teach others about the artists.[11]

A key reason I collaborated with Robyn on this project was to get her feedback and perspective on some of the central components of Place-based Design. While Robyn had a history of using a design-based pedagogy to guide her teaching, at the time, she was less familiar with theory and practice tied to place-based and democratic education. As a result, I also anticipated that our collaboration would shed light on the types of professional development experiences teachers might need in order to build their understanding of, and capacity for using, Place-based Design as a framework for engaging students in place-based learning.

In alignment with the overall goals of this dissertation study, the central aim of developing, implementing, and analyzing this designed case was to build on what was learned in the Neighborhood Game Design Project, and move one step closer to identifying the goals, values, and methods that would define the first iteration of Place-based Design. In support of this broad goal, the case study was designed to:

1. Describe how key elements of place-based, design-based, and democratic education were combined to develop and implement the Everyday Art Project.

[11] Mark Wagler was also involved in this project. At the start of the project he visited the class as a representative of the museum in order to provide an overview of everyday art. He also joined us during one of our field experiences. Finally, he provided students feedback on their designs.

2. Identify key themes that emerged tied to students' experiences learning within this context.
3. Identify critical components of the intervention and consider how they might be used to define the goals, values, and methods associated with Place-based Design.
4. Consider how the key themes and critical components might be used to develop design principles that can be used by others interested in using Place-based Design to guide their own teaching.

While the Everyday Art Project built on many of the ideas and lessons learned during the Neighborhood Game Design Project, it differed in several ways: (1) it placed a greater emphasis on engaging students in ethnographic fieldwork; (2) it placed a greater emphasis on developing tools and processes for helping students manage their individual progress on projects; and (3) it involved designing a final product for, and in collaboration with, a partnering community institution – i.e., the Madison Children's Museum.

Building Blocks

As with the previous case, we began planning the project by asking three framing questions: What broad area(s) of interest or exploration will be central to the work? What place(s) will be central to the work? What design challenge(s) will be central to the work?

What broad area(s) of interest or exploration will be central to the work?

One of the main goals of this project was to introduce students to some of the basic methods and concepts that folklorists and other ethnographers use to study local culture (Bowman & Hamer, 2011). In particular, we wanted students to be able to identify, document, analyze, and share instances of creative expression rooted in everyday materials, practices, interactions, and traditions. In light of this goal, we decided to anchor the project around the concept of "everyday art."[12]

For the purposes of this project, we began by defining "everyday art" as creative expression that is intentional (i.e., a beautiful sunset does not qualify) and tied to local culture. Some examples include: cake decorating, artfully folding napkins for special occasions, and creating handmade signs to promote an event. It also includes performances such as, a celebratory dance, a complicated handshake, or the unique style and cadence of a farmer calling his pigs (see Figure 14 for additional categories).

> Everyday everyone creates art and enjoys art created by others. We arrange words, objects, sounds, movements, colors, lines, rhythms and other elements of our ordinary lives into patterns and expressions – intended to bring pleasure to ourselves and others, or provoke sensory and emotional responses.
>
> *Categories of things to look for:*
>
> - ***Hair, jewelry, tattoos***: Find someone with creative, personal adornment.
> - ***Vehicle art***: Find an inventive paint job, muffler, or other customized addition to a bus, bike, delivery vehicle, or car.
> - ***Oral expressions***: Find an example of storytelling, metaphor, insult, greeting, rhyme, vendor's pitch, come-on, slang, or other lively talk.
> - ***Movement, gesture, performance***: Find an example of expressive sign language, facial expression, dance, walk, or other creative body movement.

Figure 14. Excerpt from the first version of the field guide we used during the project to help students find examples of everyday art.

[12] Mark Wagler and I had experimented with this concept as part of an earlier project, and found that it provided a framework that helped students notice and analyze examples of creative expression rooted in local culture.

While fieldwork was central to the Neighborhood Game Design Project, it focused on exploring local issues from a range of perspectives. In this project, we wanted to narrow the focus of students' inquiry. We wanted them to study fewer ideas, but dig deeper; interview fewer people, but engage in longer interviews. As a result, we placed more emphasis on helping students develop their interviewing, photography, note taking, and observation skills across a series of fieldwork experiences.

What place(s) will be central to the work?

We did not have specific places in mind to explore as part of this project. However, we established some criteria to guide our selection: (1) we wanted each place to provide a range of easily accessible examples of everyday art within walking distance of each other; and (2) we wanted to explore places that allowed us to look for patterns within and across contexts. While we selected the location for the first field experience, we worked with the students to co-select the subsequent places. As part of the decision-making process, we asked students to both consider places they would like to visit and places they knew from their own experiences would fit our criteria.

What design challenge(s) will be central to the work?

While the exact nature of the end product or experience was not fixed, we challenged the students with co-designing an exhibit for (and with) the Madison Children's Museum. Because of time constraints, we anticipated that we would not have enough time to engage the students in designing the exhibit from start to finish. As a result, one of our initial tasks was working with the students to gauge the extent to which they wanted to and could be involved. In the end, we agreed that they would serve as design consultants and provide the museum with content, ideas, and plans for

a final design. The museum, however, would be responsible for completing the final production and design work.

This was an important step because we wanted to be as transparent as possible about the role (and expectations) each party would play in the process. It was also critical because this approach runs counter to how schoolwork is traditionally organized and assessed – i.e., students are often assessed on completed products that they did on their own or in small groups. In our case, we framed students' ethnographic content and prototype as their "final product" or deliverable. The final exhibit would be an extension of their work, but they would not be directly responsible for designing it. Within this context one of our key concerns was making sure the students did not feel like their designs were being taken over or co-opted by the museum. Similarly, it was important to have this conversation with the museum to make sure they were being sensitive to and honoring the students' work.

Another design challenge embedded within the project related to improving the materials and activities we used to support students' fieldwork. As part of this challenge, we invited the students to help us refine the strategies and tools we used, and co-design new ones. Our rationale for engaging them in this process was that we hoped the project would be continued, and that other students would do similar work in the future. We also found that it provided us with an opportunity to model the iterative design process, including key aspects of the critique process – e.g., how to organize and frame a critique session, and how to ask for specific feedback from users.

Core Phases

The Everyday Art Project consisted of four curricular phases. While there was some overlap between the phases, the general trajectory of the project moved from a series of short inquiry and design activities, to a more immersive and focused line of inquiry and design. The first phase included an overview of the project and an introduction to the concept of everyday art. The second phase included several fieldwork activities where students engaged in introductory ethnographic work as a way to progressively build their understanding of everyday art and develop their skills as ethnographers. The third phase focused on more extensive fieldwork, where students visited with three artists in order to document their work. The fourth phase consisted of a sustained design project where students generated ideas and built mock-ups and prototypes for a museum exhibit that was eventually installed at the Madison Children's Museum. As part of this final phase the students worked with representatives from the museum to set some initial, albeit broad, design goals, and then later as they began building artifacts (e.g., mock-ups), get feedback on and modify their designs.

Phase One: Setting the stage

We opened the project by inviting Mark Wagler to come in as a representative of the Madison Children's Museum. In this role, he introduced the design challenge and provided a general overview of everyday art via a short presentation. As part of this, we facilitated a short discussion where we asked students to share examples of everyday art from their own life. We seeded the conversation with some questions that helped them identify examples. These included:

- Let's look at your clothing, backpacks, and accessories. Does anything reflect everyday art?

- What do you make? What do people in your family make or design?
- Is there a space in your house that is designed, put together, or arranged in a way that has an aesthetic feel to it?
- Are there any creative people in your neighborhood? What do they make?

We explained to the students that the concept of everyday art was a work in progress, and that there was not a fixed definition. Indeed, we said that developing a "working definition" that combined the students' ideas with the ones we developed was one of our initial goals. As part of this opening sequence, we established some key ideas and phrases that helped us as we began looking for examples of everyday art in our community. These included: "part of daily life," "handmade," "not fine art," "not museum art," "not mass produced," "not mainstream," "not national," "expresses local aesthetics, functions, practices, and meaning," "D.I.Y.," or "tied to the local."

Phase Two: Exploratory fieldwork

Immediately after establishing a working definition of everyday art, we started phase two of the project. The major focus of this phase was on exploratory field experiences, where students visited different neighborhoods in order to identify and document examples of everyday art. After our first field excursion, which took place in the traditional downtown area near our school, we asked students whether or not they wanted to visit additional neighborhoods, and if so, which ones. We also discussed criteria for selecting neighborhoods based on a confluence of our shared curiosity and the need to further develop our understanding of everyday art. In the end, we visited two additional neighborhoods: a downtown and residential area in a rural town that is part of our school district, and a commercial and residential area in a neighboring, much larger, city. We also asked students to explore their own neighborhoods outside of school. One

benefit of selecting distinctly different neighborhoods was that it allowed us to identify patterns within and across contexts.

Each of the field excursions followed a similar trajectory that included the following stages: opening circle, exploration and documentation, short debrief circle (in the field), longer debrief circle (in the studio), and an extension activity.

Opening circle.

We started each excursion by meeting as a group to deliver instructions and materials, which included a clipboard, a field guide, and a mobile device for taking pictures and recording audio and video. The first page of the field guide included a map of the neighborhood, and a list of categories and prompts with ideas for what to look for. The second page included some basic tips for doing short interviews, some "starter questions", and a place for recording notes. We made a point of making these meetings short, so that we had more time to explore.

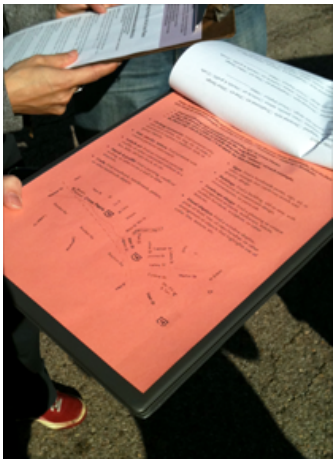


Figure 15. We provided students with a field guide to scaffold their inquiry during neighborhood excursions. This image shows students reviewing the guide before starting their fieldwork. While staff created the initial version, students helped refine the field guide across the three excursions.

Exploration and documentation.

After the opening circle, we broke into teams and used the handouts to guide our inquiry. As part of our fieldwork we interviewed people, took photos and notes, and recorded short audio and video clips. I use "we" here because Robyn and I also engaged in doing fieldwork along with the students. We did this in part, as a strategy for modeling the process, but also because we were genuinely interested in documenting the neighborhoods and meeting new people. This approach also helped us get a better feel for the activities we were asking the students to do, and cultivated a culture of co-design and co-research.

One characteristic of these excursions was that they were fairly unscripted and the content and outcomes (while bounded by the concept of everyday art) were not pre-determined. As a result, students could develop personal micro-learning trajectories based on their interests, and emergent interactions and lines of inquiry. For example, students could visit places and document types of everyday art that interested them. Also, while they were required to use multiple documentation methods as part of their fieldwork, students could focus on using method(s) that appealed most to them – e.g., some students spent more time on interviewing people, while others took photos. Not surprisingly, students reported this as being one of the unique and appealing aspects of the project. This quote from Mikhaila provides an overview of this perspective:

> I don't have to be chaperoned. I feel like I'm not being chaperoned even if maybe a teacher is following me around and doing stuff with me. I feel like they're there just because maybe I needed help, or we're just in the middle of talking. I feel more independent than I would on a regular field trip. Like if I were to walk away from the group just to go see something maybe 20 feet away, I wouldn't get screamed at. It's like, 'you left the group; what are you doing over there; you're supposed to be with us over here and you're supposed to be listening to this tour guide.' I don't want a tour guide, and that's nice that we don't have that. We just

find our way around and learn by ourselves . . . It felt personal. We went into our place of choice. We weren't there because the teacher told us to go there . . . It was nice that we were there because we could stay as long as we wanted or we could leave if we wanted to.



Figure 16. Examples of everyday art that students located during their field excursions. Clockwise from the upper left: a "ghost bike" representing a location where a bicyclist was killed; a poem written by a neighborhood resident that was poured into a sidewalk; a scarecrow protecting a community garden, a handmade sign, "tall bikes" that were made by welding two frames together; the front yard of a person who uses traditional weaving practices to make functional fencing, sculptures, and baskets out of salvaged plastic; and a vegetable display.



Figure 17. Mikhalia taking a photo of the handmade signs adorning a local coffee shop.

Debrief circles (in the field).

Each excursion ended with a debriefing circle at a location in the neighborhood. These were short discussions where students shared examples they found and reflected on the experience. While we followed up with more extensive reflections back in the classroom, these short debrief sessions were important for capturing students' initial reactions, building team cohesion, and developing our sense of place in relation to each neighborhood.



Figure 18. Molly sharing a picture she took of an origami elephant made from a dollar bill as part of an "in the field" debrief circle.

Debrief circles (in the studio).

These involved longer discussions where we analyzed the photos and video we captured, and continued to refine our definition and shared understanding of everyday art. We also used these circles to provide feedback on students' ethnographic techniques and provide instruction tied to particular skills, such as note taking, photography, and interviewing. These circles also became important for getting

feedback from students on the project, and for gauging their interest levels and conceptual understanding.

Because many aspects of the project were emergent these circles also became an important site for "holding things together." That is, they provided a space for us to continually (re-)frame the project, revisit our goals, and draw lines between the activities we were doing and upcoming events. They also provided a space for students to ask questions, provide suggestions for how things could be improved, and introduce ideas for new things to do. As with the Neighborhood Game Design Project, we encouraged these types of interactions by explicitly seeking students' feedback, via both oral and written queries.

Another feature of these debrief circles is that they provided space for students to share their own stories and experiences of place and discuss emergent questions and ideas. For example, students often discussed their own neighborhoods or families in relation to the places we explored as a group. As students more seriously considered everyday art, several additional "areas of interest" surfaced. These included discussions about buying local, upcycling, and maintaining traditional culture. While some of these concepts were new to students, and even ran counter to their own identities, values, and consumer practices, as the project unfolded their awareness of these concepts and behaviors increased. While we chose not to explicitly layer these additional concepts onto this project, a natural continuation or extension would be for students to do more extensive research on one of the themes, questions, or topics that surfaced as a result of their fieldwork.

Fieldwork extension activity.

After each field excursion we engaged the students in short design activities. The first activity they completed was intended to help us refine the initial categories we used to scaffold students' inquiry and documentation. We began by looking at printed versions of the photos we took in the field, as well as some photos Robyn took on a previous occasion. We then worked with the students to organize the images based on our initial categories. We explained that one of the goals was discovering whether these categories "worked," or they needed modification (e.g., do we need to get rid of some, combine some, or create new ones?). We also asked the students to look at the field guide we developed and make suggestions for how it could be improved. To do this, we asked them to draw from their own experience using the guide, as well as what they learned by categorizing the images. We took the students' feedback and used it to develop the next iteration of the guide, which they used during the next field excursion.



Figure 19. After each field excursion I printed the photos students took. This is my preferred method of having students view and share their photos.



Figure 20. Students organized the photos based on a tentative set of categories we established as part of the first field excursion.

After the second field excursion we asked students to identify a strong example they found of everyday art, and write several paragraphs explaining why it met their definition. We then asked them to present these to the class. Finally, we selected several examples from our collection of images that were more difficult to classify and encouraged students to discuss why they believed these should, or should not be considered everyday art.

We also asked students to provide feedback on a pre-existing idea for an everyday art exhibit. The idea for the exhibit came from an earlier workshop Mark and I had organized, where a group of high school students developed and tested prototypes of a “kid friendly” exhibit that incorporated photos collected by other youth. The main concept was that users could curate their own photo exhibit by selecting images (based on a theme or topic of their choosing) from a collection of photos. While these curations (which also included a title and brief description) would be temporary, they would be photographed, and in turn would become part of an exhibit. We included this activity as part of the project for two main reasons: (1) we wanted to model and discuss the concepts and practices associated with building and testing prototypes; and (2) we wanted to see whether the current students were interested in building on this idea. After testing and giving feedback on the design, however, the students decided they wanted to create a completely different exhibit, rather than build on this one.

After the third field excursion the students built visual displays representing a theme or topic that tied together examples of everyday art they had documented. The designs – which they built using a rapid-prototyping process – combined maps, images, text, and words. The themes or topics students selected included: recycled materials,

murals, and re-assembled objects. As part of this activity we reinforced some of the key practices and language associated with iterative design. We also framed this as a pre-design activity that might help them generate ideas for their exhibit design.

Overall, these field excursions and follow-up activities proved useful in several ways: (1) they helped develop our shared understanding of everyday art; (2) they provided opportunities for students to meet local residents who would later become central to their design work; (3) they served as entry points for a range of other discussions and questions related to local places and culture; and (4) they served as shared experiences that allowed us to connect with the students and build group cohesion.

Phase Three: Ethnographies

After our introductory field excursions, we re-directed students' attention to the main design challenge – i.e., designing an exhibit about everyday art for the Madison Children's Museum. While we started with a brainstorming activity, the students quickly decided they wanted to build an exhibit that would allow them to profile several artists (versus developing an exhibit that presented everyday art as a whole in the way we had been exploring it). One of the main reasons for this decision was that students were interested in talking with "everyday artists" and learning more about what they made and why.

In order to guide students' selection of artists to profile for the exhibit, we helped them brainstorm, and then select, three people they wanted to do preliminary interviews with. Two of them were people the students had met as part of their fieldwork. The first person, Kathy, was a dressmaker who two of the students had talked with after noticing

a creative display she had designed outside of her store. In addition to being interested in fashion, they wanted to follow-up with her because they were intrigued by some of her custom work – including a wedding gown and matching tuxedo made of camoflauge material. The second person, Todd O., was a fly fisherman and storeowner who sells fishing supplies, makes flies, and teaches others about fly fishing. The students were impressed by his shop, which had a lot of art on display, and were drawn to him because he was "really interesting to talk with" and "really passionate about his work." The third person, Todd C., was a friend of mine who builds guitars based on a style that was popular in the early part of the 20th Century. He also uses many traditional building techniques and has a strong interest in preserving traditional music.

Initial site visits.

Once the artists had been selected, we helped the students arrange site visits so they could do introductory interviews. Each of the site visits included the following three components: preparation, ethnographic fieldwork, and debrief circles.

Preparation – Before each visit we did some brief preliminary research on each of the artists. We also generated the broad themes or concepts we wanted to interview them about. Instead of establishing a list of questions, we guided students to use a technique where they developed questions around key concepts (see figures 20 and 21). While there were some starter questions associated with each of these categories, we wanted students to work on conducting interviews that included cycles of listening, and responding to interviewee's answers with follow-up questions (versus reading from a list of questions).

Before each visit, we also established the role(s) that each student would focus on – e.g., lead interviewer, lead photographer, lead videographer. While students were all expected to ask questions and take video and photos, we selected leads to make sure that key questions and ideas got covered. Selecting a lead interviewer also helped maintain the flow of the interview and made it easier to work with students on developing their interviewing skills.

One benefit of this approach was that it allowed students to follow particular interests. For example, one student focused on developing her expertise as a photographer as part of this project, while another enjoyed doing interviews and wanted to work on becoming a better interviewer. One downside of this approach was that it provided an opening for some students to shy away from practicing their interviewing skills. As a result, we tried to create a balance between leveraging students' preferences and strengths and encouraging them to develop new skills.

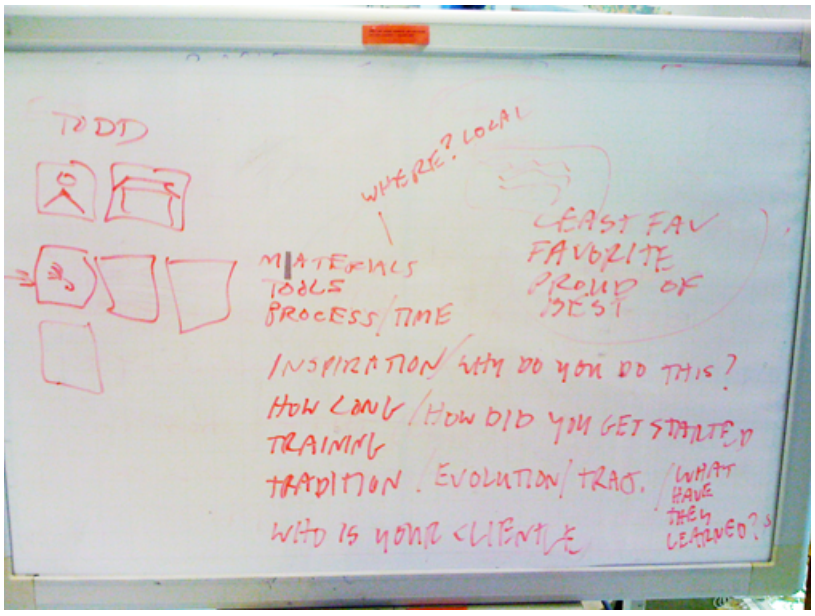
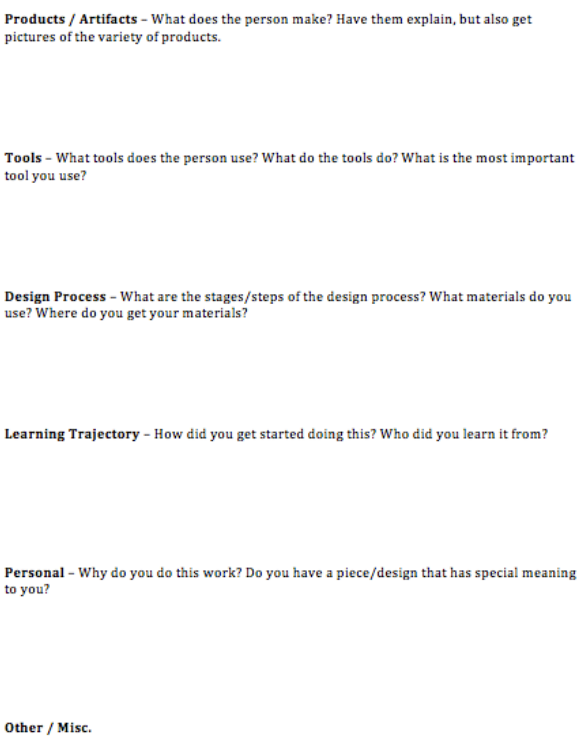


Figure 21. Notes from a brainstorming session where we developed categories or themes students wanted to follow-up on as part of their more in-depth interviews and documentation.



Products / Artifacts – What does the person make? Have them explain, but also get pictures of the variety of products.

Tools – What tools does the person use? What do the tools do? What is the most important tool you use?

Design Process – What are the stages/steps of the design process? What materials do you use? Where do you get your materials?

Learning Trajectory – How did you get started doing this? Who did you learn it from?

Personal – Why do you do this work? Do you have a piece/design that has special meaning to you?

Other / Misc.

Figure 22. Note taking guide students took with them during the site visits.

Ethnographic fieldwork – Each of the site visits was organized around a central interview with the artists. We recorded the interviews (and paid to have them transcribed), so that students could focus on listening and asking follow-up questions. This also supported our goal of having students focus on writing down key ideas and phrases from the interviews, versus trying to record extended quotes. Another strategy we encouraged students to use was to direct the interview subjects to show examples, and *show how* they did things, versus only *talking about* how they did things. One outcome of this approach is that it made it easier for the photographers and videographers to collect content that showed the artist in action. While the students captured a great deal of content as part of these site visits, several of them resisted taking notes as part of the field experiences. One reason for this may have been that

students relied less heavily on their notes during their follow-up design work, than on their visual documentation and transcribed interviews.



Figure 23. Molly serving as the lead interviewer during our visit with Todd O., a local fly fisherman and folk artist.



Figure 24. Taking notes and capturing video while Todd C. points out the rosette inlay he embedded in one of his guitars. He later walked through the steps showing how it was made from scratch.

Debrief circle – After each site visit we asked the students to share their main takeaways, reflect on the experience, and discuss anything that was unclear or really intrigued them. In order to prep students for these discussions, we first asked them to complete short written reflections. Then, during the discussion we had them reference their written reflections, share their visual documentation, and reference their field notes. Another part of these circles included projecting some of the images and video that students took so they could discuss the content and get feedback on their technique and the quality of their documentation. For example, we provided feedback and instruction tied to video and photography, etiquette (e.g., asking permission before taking photos), interviewing style and techniques, and note taking.

Phase Four: Design intensive

After they completed their initial site visits the students divided into teams based on the artist they wanted to follow-up with. While each team was responsible for developing their own exhibit, we began by brainstorming initial criteria as a whole group. Through this process, the students determined that they wanted their exhibits to show the main tools, materials, and processes the artists used, as well as the products they created. They also wanted to get at the "personal aspects" of their work, and share why it was meaningful to them.

Because the exhibit was going into the children's museum the students also considered ideas for making the exhibit more appealing to kids. One design goal was to include a "hands-on" component, where users could interact with the materials and even produce artifacts that mirrored the artists' work – e.g., the students documenting the dressmaker said that it would be cool if the kids could draw their own patterns, or

make their own paper dresses. Finally, they set as a criterion that users should be able to access additional information if they wanted to. In part, this stemmed from students' recognition that they had already collected more content than they could share via an exhibit.

Once we started this phase, a majority of class time was devoted to open lab time. During this time, students worked on a range of tasks related to their project. At any given time, students were reviewing notes, photos, and video from their field visits, selecting key ideas and quotes from the interview transcripts, editing images and video, working on their exhibit mock-ups, or giving and receiving informal feedback on their designs. While students progressed at different rates, and via different trajectories, we established several deadlines, so that we could formally check-in with students and provide a series of mile markers to help them gauge their progress.

The main studio space we used during this phase consisted of a large art lab with movable tables and two smaller side rooms. As with the previous project, the flexible and modular set up of the classroom space allowed for fluid movement between large and small group work configurations, and made it possible for students to spread out during open lab. Throughout the project the students had access to digital technologies and art supplies, which made it easy for them to do research or production work as needed.

Initial sketches, mock-ups, and critiques.

The first deadline we established was for students to present sketches of their initial ideas for the exhibit. Each team presented these as part of an internal critique session, whereby the participants were members of our school. Students used the

feedback they received on their sketches to build the first version of their mock-up, which in turn, they presented as part of a second round of critiques. Finally, the students used the feedback they received on this version to build the mock-ups they would later share with the museum staff.



Figure 25. Molly working on a sketch of her exhibit ideas.



Figure 26. Travis beginning to build a mock-up of his exhibit idea.

While most of the students quickly developed core concepts for their exhibit, one of the students, Travis, had difficulty with this task. In order to help him progress, I presented several broad design concepts to him, and invited him build on one of these, or continue brainstorming his own ideas. Travis chose one of the ideas I had presented. While Robyn and I questioned whether this was the correct approach, we decided on this strategy because we did not want Travis to get stuck on developing an initial idea, when this was only one part of the entire project. Once Travis was clear about what he was going to produce, he had much more success setting and completing design tasks. Additionally, he was still required, and able to, make decisions tied to the selection and

presentation of his content – i.e., he still had to actualize the concept, which required a range of skills and design decisions.

This situation brings to light questions related to how much, and what types of guidance and direction students need (and should receive) to help them manage open-ended design challenges. We wanted students to have ownership over their work, however, they did not always have the habits, skills, or prior experiences (particularly in relation to formal design practices) needed to manage a complex, open-ended design project. While a goal of the project was to help them develop these skills, there were times when we decided to provide more direction (either to the whole group or to individual students) in order to help them move forward. In this context, a challenge for us as teachers was walking the line between supporting students' work, and micro-managing them. Robyn and I consistently discussed and negotiated the degree to which we let students fall behind on their work, or deal with the "natural consequences" of being unprepared for a critique session, or other deadline.

We also discussed this balance with students in order to get their perspective. In one of these situations, Courtney said that it was important for students to have opportunities to take responsibility for their own work:

> Most classes we sit down and they would be, "What you want to do next?" We figured out what we're going to do and then you just went off and did it. The teachers trusted you that you were going to do what you needed to do. That's cool that you guys trusted us to get work done instead of hovering over us like most teachers would do in projects like this . . . Usually teachers need to be holding your hand the whole way through. I felt you gave us a good amount of freedom and respect.

One strategy we used to help students manage their workflow was a project management board, where they could document their work, prioritize tasks, and plan

their trajectory (see figure 26). We used the board to implement a modified agile development approach, where the students ranked tasks based on their priority and how much time they would take.



Figure 27. We helped students organize and manage their workflow using an individual work trajectory. This included ranking their tasks and setting time deadlines. In turn, these were modified as a result of check-in meetings we had with individuals and teams. Having students' workflow visible made it easier to engage in conversations with them about their progress.



Figure 28. Using the design board and mock-up to facilitate a table critique.

While we initially considered using a digital/online platform for this purpose, we decided on a physical board. One reason for this is that in the past we found that physical boards were easier to integrate into students' workflow, required less of a learning curve for how to use them effectively, and supported more informal and impromptu discussions. Students responded favorably to the boards, and reported that they were useful in helping them manage their work, without getting overwhelmed:

> Having that task board was super helpful towards the design process, just learning how to break it down a little bit. That was probably the most helpful thing for me. I felt overwhelmed at times, but then I felt I could just re-center myself and I was taught how to stay on task. I felt a lot of support and that was really cool . . . I thought it was a good way to keep kids motivated and to feel like, you know what; 'I am getting stuff done.' You sit there and think, 'Oh I didn't get anything done.' But then you see 13 sticky notes moved because there were small things that you got done. I thought that was a really helpful thing to have, and it definitely kept me on task. It was like, 'Okay, what do I need to do today?' I didn't have to waste time coming into class with, 'What do I need to do,' because it was already there. I just looked at it and I was like, 'I'm going to do this and this and you do these and these. Let's go!' I thought that was really awesome and something that people should do. Now I use it at home. I think oh I have all this homework. I make a task list of what I did today, what I have to have to done by the end of the week and what I can get done today. – Molly

Another challenge we ran into during these early design activities was not being able to consistently communicate with staff from the museum. One issue was that it was difficult for us to align our schedules – i.e., the museum staff had limited availability because of previous design commitments, and we were constrained by the school calendar. As a result, while the students may have benefited from sharing their very initial ideas and mock-ups with the museum, this did not occur. In part, earlier feedback would have been useful for the students because their mock-ups included simple design "errors" that were not caught until later, when their work was first presented at the museum.

Follow-up site visits and deeper ethnographies.

> You can't learn everything about anybody or any place in one day. Not just the facts, but the feeling. I think in maybe every place that we go – like this place I went there three times now – we need to go there more than once. – Mikhaila

As students presented and iteratively improved their mock-ups, they identified additional materials and more targeted information they needed from the artists. One outcome of students' additional ethnographic work was that they began collecting large amounts of photos, videos, and interview text. In turn, this created some tension, and even a disconnect, between the rich content and stories they were gathering and the design context – i.e., an exhibit at a children's museum. One of the errors students made in trying to reconcile this tension was including too much information in their mock-ups. We attempted to help students work through this challenge by letting them know that the exhibit would only be one of the outlets for their work. From our perspectives as teachers, we did not want to see a reduction in the amount of ethnographic research they were doing. As a result, while this was not an original goal of the project, we began brainstorming other ideas for how we could share their work.



Figure 29. Haley and Courtney working on their mock-up. Haley is on the phone with the dressmaker, while Courtney is cutting out pieces for a “hands on” or interactive activity they planned to include as part of their exhibit.



Figure 30. Haley and Courtney talking with Kathy as part of their follow-up visit. We helped all of the students prep for their follow-up visits, but did not attend with them unless they asked for help or were struggling to produce quality artifacts/ documentation. This was part of “gradual release” strategy, whereby students took on more responsibility for their ethnographic and design work across time.

Museum visit and critique.

We set a date on our calendar for visiting the museum, so that students could take a tour, meet additional staff members, and present their mock-ups. Having a deadline helped focus and motivate the students, and reinforced that their work was going to be shared with a "real world" audience.

Vignette: A trip to the museum.

It's the middle of the day, and we are sitting around a table at the Madison Children's Museum. The group consists of me, Robyn, the students, and three representatives from the museum – Brenda who is the head of exhibits, Mark, who is serving as an exhibits consultant, and Erin, who helps develop youth programming at the museum.

We just finished a round of brief introductions and are in the process of transitioning to presentations. Molly has volunteered to share her work first. She grabs her mock-up and rests it on a couple of chairs, before turning to face the group. Molly put a lot of work into her design on the days leading up to our visit, and as a result, her mock-up includes the greatest level of detail and polish. Despite being prepared, when we asked the students how they were feeling on our way to the museum, Molly said she was nervous to share her work. However, she does not show any signs of this, as she confidently begins her presentation.



Figure 31. Molly presenting her initial mock-up to the museum staff. Each of the smaller panels lifts up, so users can access additional information and see and touch physical artifacts (e.g., flies, feathers, etc.).

Molly: The everyday art I chose to focus on was the fly shop in Cross Plains. It's called On the Creek. The owner is Todd Opsal. All this [pointing at her mock-up] really is information that I got from talking with him, and really just looking through all of his things.

Mark: Tell about how you found it, how the class found it.

Molly: I know that we were just walking around Cross Plains and we were split up into groups. I wasn't in the group that found him, but they were looking around the shop and saw all this really cool artwork that was in there on the walls. He has a lot of unique pieces and stuff that is really interesting, so we decided we wanted to go back and find out more. Then we did that and we got really good information from him. I had no idea about fly fishing. I didn't even know what it was, and now I'm pretty well knowledged on it. What I did is focus on four main areas that I thought summarized it. It is the materials, process, finished product and accessed information. The main thing I focused on was the process of the flies and what goes into making them. These are all of the materials, and then pictures of all the stuff he uses. There are threads, wax, lead, bobbin threaders, scissors, material holder, feathers, pliers, ribbon, fur, hook and yarn. Here we can see all of those. This is a rooster feather and each feather has a different texture that attracts different fish. The process is really cool.

Molly continues sharing more of the content displayed on her mock-up. On several occasions she mentions how she really enjoyed meeting Todd, and how passionate he is about his work. Brenda, Erin, and Mark ask some additional questions about the content, and Molly's responses demonstrate that she has learned a great deal about the interrelated components of fly fishing – including the relationship between the stream ecology and different types of flies. After thanking Molly for her work and commenting on the richness of her documentation, Brenda provides some feedback on the visual aspects of the design.



Figure 32. Brenda, Erin, and Mark providing feedback on students' designs at the children's museum.

Brenda: I think it's very colorful and visual and impressive. I really like the way you have information layered. A lot of times at the museum we try to keep our information pretty sparse, but then you always want to have back-up information for people who want more. It's nice that you've got layers of information. I think that's really good. I like that you have the real thing here. You've mixed in some of your drawings and more detailed work. I think all of that is really terrific and it seems like you've covered lots of really good areas. I would say the one recommendation I would have from an exhibit perspective is that when I look at it, all of the information seems to have the same

> weight to me. You know when you're writing a paper and you have to come up with the thesis and you keep that in mind throughout the whole thing. When I look at this, this is the same size as this. I want to know what the title is. What is this about? It's an idea about categorizing and when you look at something how do you know what the big idea is? It's just a matter of how we organize it and what is the theme? . . . This, the way it's presented, is that there is the same visual weight, so my eye doesn't know where to go first. I'm looking for something that draws me to the place where I get the big idea.

Molly: I definitely agree with that thinking, so you know when you look at it, what it is.

Brenda: Yeah, that's kind of a small thing. I think you have really good ideas here and it's just a matter of thinking about the viewer. We always have to think about how do people interact with what we're making, and what do they see, and how do you make it clear? When you're looking at something visually, how do you make sure that you know where your eye is supposed to go?

After some additional discussion between Molly and the museum staff, including some more positive comments about the amount of documentation Molly did, Brenda provides some additional feedback.

> The other comment I had is that if this was on display at the Children's Museum it's probably a lot of text for the age of the audience that we have. Maybe this will be used in multiple contexts or whatever. You are obviously a different audience than what we have here. But really to think about who is the audience, what is their reading level. At the Children's Museum we always think about how can we teach things without a lot of words. Can you do it in a totally visual way? Or can you do it by doing interactive components? Those are things we think about all the time.

Molly takes Brenda's feedback in, and ends her presentation by sharing another idea she developed where younger kids could engage with the exhibit by making their own flies. She describes an example of one she made out of yarn, a pipe cleaner, and a paperclip. She explains that she developed the idea as a way to include a kid friendly component to the exhibit that was more "hands-on" and appropriate for kids. This starts

a conversation between the museum staff where they quickly brainstorm an idea for possibly using Molly's work in the art area at the museum, or including it as part of a special program or workshop.

The rest of the meeting continues in this same fashion, as other students present their mock-ups and receive feedback from the museum staff. At the end of the presentations, Brenda suggests that we take a tour of the museum. In particular she wants to show the students an exhibit that is currently on the floor, but still in the prototyping stage – i.e., it is set up on the floor, so the designers can see how it is being used before developing the final version. As we walk around the museum, Brenda points out several other exhibits and discusses some of the design principles embedded in the final version, as well as some of the testing they did during the design process. Before ending, she also takes us downstairs to the prototyping and exhibit design workshop. Again, Brenda points out some examples of prototypes from previous exhibits, and asks students to notice how "rough" or "basic" they are. Later, several students comment that seeing the prototypes at the museum was really helpful in that it gave them a better understanding of how exhibits were designed, particularly the role that testing plays in the process.

As we leave the museum we begin talking with students about their experience. Molly said that the feedback she got from the staff was really useful, but wished she would have received it sooner, before she put so much work into her design. When I discuss this later with Molly she says:

> Yeah. I didn't get that memo [about the mock-ups]. I thought that was the one we were going to be presenting, and was the big one. It definitely would have helped my mental state if I would have gotten that. I looked around and everyone else got that memo. It was written in pencil. Mine was like, all out there. I was like, 'Oh

> my gosh, I just spent two weeks on this,' when the one we presented as our final thing would have been the one to [do that on]. So, that definitely probably would have helped. There maybe should have been more clarity on that because I didn't get that part of it. I thought that was the one we were presenting and it should be totally cleaned up.

Later, when Robyn and I reflect on the visit we use Molly's experience to consider what we might do differently in the future. For example, we discuss how adding a more in-depth study of exhibit design would provide students with some basic heuristics to guide their work. We also discuss the value of working more closely with the museum in the early stages of the design process. However, we also wonder whether getting feedback too early in this case may have decreased the students' sense of ownership over their design, and perhaps even reduced the amount of ethnographic work they did. We also try to unpack why Molly was confused about the role that her mock-up was intended to play in the overall design process. We attribute it to a number of connecting factors, including: a breakdown in communication (i.e., why did other's "get the memo," but not Molly?); her prior school-based experiences that value final products and fixed ideas over process and evolving ideas; her desire to create artifacts that looked polished and were detailed (e.g., she said, "I was kind of scared to have something rougher. I thought it made it look like I didn't put a lot of effort into it"); and her limited knowledge of formal design processes – particularly the role that mock-ups and prototypes play in developing ideas and informing decisions across time.

Our visit to the museum turned out to be a key moment in the project. While they had met Mark, and we consistently referenced their role as consultants, the idea that their work was going to lead to an actual exhibit was still somewhat abstract. However, by presenting their mock-ups to Brenda, who is a lead exhibits designer, and getting a

"behind the scenes" tour, the students left the museum with a heightened sense that their work was unique and authentic.

> At first I wasn't really sure if we were going to get anything in the museum, but then when we actually went there, it was like, 'Wow, this is for real. We need to step it up a little bit' . . . After that, yeah, I think I was productive in my thinking, and during lunch and after [school], because I took it pretty seriously. – Courtney

> It's cool to see them actually care about it. They just didn't sit there thinking, 'Oh, these are some high school kids.' They were super connected to it, and I thought that was cool because not a lot of people get that opportunity. I was talking to my dad about it and he was like, 'Oh my gosh you're doing something for the Children's Museum? That is so cool!' You feel like you've never done anything like that before. I never thought I would be presenting something to a board of people. It was really cool. – Molly

Prototypes.

Students used the specific feedback they received from the museum staff to develop a prototype that would serve as their "final product" for the project. One of the challenges during this phase was that, despite their positive experience at the museum, the students' interest levels dropped off a bit. In part, we attributed this to a period of "post-critique blues", where students were recovering from a period of intense effort, followed by a fairly detailed and critical feedback session. While the students said that they enjoyed the experience and agreed with the feedback they received from the museum staff, they were disappointed with the amount of work they still needed to do on their next iteration. For example, while Molly said that "working really hard on something and getting positive feedback was awesome," she also added that it was difficult for her to maintain her focus on the project. Other students shared similar perspectives, and as we embarked on the last leg of the project, there was growing frustration over the amount of work involved. Molly described her experience like this:

> I was like, 'Okay, I put a lot of time and effort into it.' I was like, 'Okay, we've got this.' Then towards the next set of revisions, I was like wow, 'What else can I do?' I wasn't necessarily bored with the topic but I was kind of drained out by it a little bit . . . but it was cool going in there [to the museum] and seeing what they had to say, looking around. I liked getting critiqued on something that I did. It felt I was doing something important. But I felt I started to lose my sense of determination towards the second step of doing it. I was just drained out by it a bit.

In an attempt to address this, we invited students to share how they were feeling, and openly discussed our ideas for what we might change about the process in the future. We also shared some of the additional positive feedback we received from the museum staff, reminded them that we were almost done, shared the final due date with them, and encouraged them to finish strong. The biggest motivation for students to stick with their work, however, was their relationship with the museum, and the goal of having their work displayed via an exhibit.

As we moved closer to the second, and final, critique session with the museum staff, the students regained their focus and motivation.[13] During this design cycle, which lasted two weeks, students used what they learned from their experience at the museum, and the feedback they received from the staff, to alter their designs. These changes fell into two categories: (1) changes to the content and visual layout of their prototypes, and (2) changes in the strategies they used to create their prototypes.

The major changes we saw in relation to the visuals and content included: (1) a move towards one central and simplified image or concept that pulled the exhibit together – e.g., Molly's updated version included a central panel that had a much larger title, a picture of Todd fishing, and a short bio, including quotes that demonstrated his

[13] Because of time constraints, we conducted the second meeting via a Skype call. During this meeting the students shared their final prototypes, which reflected the feedback they received at the previous meeting.

passion for fly fishing); (2) a decrease in the amount of content; (3) less text, larger font, and more images; and (4) opportunities for users to access more information by choice, versus having all of the information presented on the primary layer. One strategy students used in relation to this final point was to integrate QR codes into their designs, so that users could view videos and read additional content if they wanted to. This also allowed them to share some of the additional ethnographic content they had collected.

In addition to these specific aspects of their design, the students also modified the strategies they used to build their prototypes. For example, they: (1) focused on refining the key concepts of the design vs. spending time on fine details; (2) reduced the fidelity of their design (e.g., while Molly's updated version was still neatly displayed, it included sketches, and both temporary and "lower-end" materials than her earlier version); and (3) built their design with movable parts that could be easily re-arranged to test different configurations. This last change was in response to some of the issues they had with their initial versions, which were more fixed and harder to manipulate and modify. Unlike their earlier versions, which dampened experimentation and made students more resistant to making changes, their newer versions encouraged dialog and quick feedback cycles. From a design perspective these changes represented a shift in students' thinking about design.



Figure 33. Molly presenting her prototype, which includes more white space and less text, to the museum staff via Skype.

Coda

After their second critique session with the museum staff the students completed a final round of modifications to their prototypes. In turn, the museum used the students' design ideas and additional ethnographic content (e.g., images, video, notes and interviews) to develop the final version of the exhibit that was installed. Because the exhibit was not completed until the summer, instead of holding an opening, we provided each of the students with tickets to the museum, so that they could visit on their own with family and friends. Then in the fall, we moved the exhibit (along with some additional photographs) from the museum to the Crossroads Coffeehouse in Cross Plains – the small town the students explored as part of our second field excursion. We chose this location because we had visited there on several occasions during the project, and the owner was interested in and supportive of our work. It also provided an opportunity to share the students' work with a broader audience. As part of the show, we organized an opening, where we invited the artists, as well as other community

members, and staff and students from the school. This (re-)extension of the students' work into the community speaks to the generative nature of the project, as well as the ability for place-based education to expand students' and teachers' networks and build community. Currently the exhibit is installed at our school, where it is being used to kick-off a follow-up project.

Central Components: Place, Design, and Democratic Participation

In this section I briefly discuss several relationships that developed between the central components of Place-based Design (Place, Design, and Democratic Participation) and students' learning experiences and overall perceptions of the project.

Centrality of place

> [One of the best parts of this project] was being able to get outside and get to know people personally rather than if you had them come in and lecture about what they do. We get to see their surroundings. – Haley

> I liked the interviews, and connecting with the artists, and hearing about their passions. – Molly

Students' design and fieldwork provided an entry point for visiting new places, and exploring, familiar ones in new ways; for meeting new people, and asking new questions. Additionally, the community provided the "texts" and content that students analyzed and engaged with during the project. As a result of their community-based experiences, students developed an increased awareness and knowledge of local places. For some students, this meant discovering a new place, or new person within a neighborhood they were already familiar with. For others, it meant changing their perceptions of an entire town or neighborhood:

> I've been there a couple times before. We went with a class. I used to not even know Cross Plains had a town. I thought it was just back roads and fields and stuff, but there is a community out there and a town. – Courtney

> Yeah, I've driven through Cross Plains probably 500 times because my cabin is up north and I always drive through it to get there and I never really have stopped in there, never really talked to anybody. When you stop someplace like that, you're like, 'Wow, there are people here who have really cool stuff.' I just thought it was a small town. Then you stop and you realize it's more of a community and he knows this guy who does work for his shop and it's really interconnected. It was kind of cool to feel the closeness of a town that you have never experienced before. – Molly

> I learned a lot about my community and how each place you go is very different, but still has everyday art . . . Cross Plains had a different environment and art than Madison. - Haley

Students also developed a greater sense of awareness and appreciation for everyday art. In addition to demonstrating this through the artifacts they produced, it was common for students to share examples of everyday art they saw outside of school, or discuss how they started noticing and becoming more interested in how things were designed:

> Well, my sister is moving and I helped her pack. I've been looking at stuff she's been packing and I'm like, 'Did you make this?' and she's like, 'Yeah,' or like our mom made it, or her boyfriend's parents made a desk. They make stuff. It's interesting to hear that people are actually making stuff. I never really think that people take time to make stuff and do crafts and art and stuff, but apparently they do. – Courtney

> If I'm walking past something and I see something, I'm like oh yeah, like that's really cool, like someone probably did that themselves. It just gives me a new appreciation for the little things, I guess, that you see and just walk past . . . I never gave it a lot of time. Having this class, it's opened my eyes to a lot to things. Now when I'm in a shop and I see something, I'm like, 'Oh that's unique and different. I wonder if they made that, if they know somebody who made that, or what's behind that.' It definitely has opened up my mind a lot. I have part of my eyes open to art that I see now. I notice things more. It's just cool when you can ask somebody about things and hear stories behind stuff. My family and mom are really into art. My sisters are too. You learn a lot about people through it. I

> definitely have changed my views on local artists and given it a lot more time and thought. – Molly

While these examples don't represent major shifts in their thinking, they speak to the potential of place-based education to provide students with new frameworks and experiences that shape how they see and interact with the world – and subsequently deepen their connection to local places and people.

Democratic participation: Choice, voice, and personal learning trajectories

> In a regular class, the teacher is in charge. They tell you what to do and you do it. In this class, you guys ask us what we want to do and ask us if we think this would be a good idea or not, and I like that . . . I always have been used to when the teacher has your whole year planned and you already know what you're going to do. This one, it's like I have to make up my mind what I want to do for the rest of the class – for the rest of the time I'm in the class. – Courtney

> We're actually asked our opinion and have a say in what we learn and study. – Molly

Core components of a democratic classroom include deliberation, shared decision-making, and choice (Apple and Beane, 2007). Our commitment to including these components in the Everyday Art Project resulted in a generative curriculum that emerged, in part, from the students' individual and collective interests and questions. As a result, one of the key things students highlighted when reflecting on their experience was their sense of agency over their learning trajectory. In part, they attributed this to being able to engage in fieldwork on their own in the community, particularly during the neighborhood excursions, and having some autonomy and ownership over their design work (both in terms of content and their work time). Additionally, the students referenced

the role that co-design played in shaping the trajectory of the project, including many of the activities they completed:

> We don't start by having the teacher tell us what we're going to study. We might have a discussion about what parts of the community interest us, or we could be given cameras and told to explore, enter places, and highlight aspects about places we like. We come to a decision together, after talking about our interests. – Mikhaila

> In a lot of classes we don't have a choice. We just have to do it because we're being told you have to learn this. In this class it's more, 'I want to learn it because it's engaging' . . . It's so nice to have the teachers say, 'Do you guys want to do this activity or is it just dead, like move on?' It's nice to have that option. – Courtney

As in the previous project, students also framed the degree of freedom in relation to their sense of responsibility. This perspective is summed up in the following quote from Courtney:

> Maybe it's just me not wanting to be a bad kid or something, but like some people would take advantage of that and be like, 'Wow, I can go [outside] and I can leave and do whatever I wanted to.' But I feel that since you guys trust us so much, I'm more, wanting to stay on task and really put in more effort because we have trust, and you don't want to ruin that because it's such a fun class. I don't want to do something that would ruin my chances of doing something like that again . . . I don't know. I just feel I would disappoint people. Like if we went downtown when we went on that thing, if I would have went some place and got some food and not done it, it would be like this was a chance for me to learn something new and I just didn't want to take advantage of it.

Despite students' perceptions, a range of variables, including the boundaries we established during the project, impacted the choices they had. While Robyn and I wanted students to have the flexibility to develop their own learning trajectories, we also wanted to constrain the project in order to maintain a degree of focus and coherence. As a result, instead of studying a wide range of concepts tied to local culture, we

emphasized everyday art. Instead of allowing students complete freedom over their projects, we had them focus on designing an exhibit for the children's museum.

One consequence of this approach was that it made it more difficult for students to follow their interests (e.g., their strongest interests didn't always align with the goals of the project), or have control over the larger trajectory of the project. This quote from Haley, who was interested in doing more "fine art," touches on this:

> I feel like I have a lot of freedom about what projects I do, and how I want to do them. I feel like we have a lot of trust to go out into the community by ourselves at times. But, as for what we do in class I don't have as much choice.

In part, Haley was making the point, that while students could choose what "their exhibit was going to look like, and what was going to be in it," the goal of designing something for the museum was not optional – i.e., it was a "fixed" component of the project. Courtney also emphasized this point, adding that from her perspective if the class had complete control over their learning, they probably would be doing more traditional artwork: "I think if we had a ton of choice we wouldn't be doing the children's museum thing. We probably would be doing art projects, like drawing or painting."

While it limited students' options, the boundaries we set also benefited the project (and students' learning) in a number of ways. For example, it made it easier to align students' learning with specific curricular goals and graduation requirements (e.g., art and social studies requirements related to cultural studies), helped us orient and manage the flow of the project, and made it easier to help students assess their learning in relation to the skills and concepts we, and they, were trying to develop (e.g., we could focus direct instruction and assessment on a tighter range of skills and concepts). This approach also helped keep students from getting overwhelmed, and allowed us to apply

a “gradual release” model – whereby students had greater autonomy over their work, as we progressively established classroom rituals, expectations, and norms.

From a curriculum and instructional design perspective, while we wanted to provide students with opportunities to follow their interests, we also wanted them to develop new interests, have new experiences, and take on new roles. For example, Travis said that one thing the project did was allow students to “interact with different things and people we normally wouldn’t do in school.” Indeed, all of the students said that engaging in this type and depth of fieldwork was new to them, and that they had never been involved in designing an exhibit before, or working with a community institution like the children’s museum. They also mentioned how the nature of the work forced them go outside of their comfort zone, and change how they typically interacted in class. Mikhaila, for example, discussed how the project helped her become more comfortable with critiques – an activity that typically makes her extremely anxious. In part, she said that having adults involved in the critique sessions made it easier for her because she felt safer sharing her work. Courtney and Haley discussed how it was nice to engage in fieldwork on their own because it forced them to be more proactive as learners. For example, they both said that in larger groups, when teachers and other students are present, they are more passive and let others take the lead on asking questions and maintaining discussions. When given opportunities to work on their own, however, they were required to take on more responsibility – i.e., they could not let others “do the work.” In their mind, this was a positive aspect of their experience, and one they actively sought out.

Design: Doing "real work"

> A lot of times in class when you make something – you make a project and you show it to the teacher, and throw it away. This is actually going somewhere. That is really cool. – Courtney
>
> [N]ormally I say 'screw it,' and it is what it is. But, I put a lot of effort into making [my exhibit design] something someone would want to look at, even when I was not in the mood. – Haley
>
> Then I talked to Todd and I thought, 'This is what is going to make this a motivation for me, because Todd is super cool.' That is when I was like, 'Okay, I'm going to kick ass on this because this guy has such a passion about this that I'm not going to half-ass something that someone cares so much about.' – Molly

The students' design work provided an enabling context for studying the local community, and a thread that helped hold the project together. While they found the project challenging and frustrating at times (e.g., Molly said that doing multiple revisions was one of the worst parts of the project), they were generally motivated to complete quality work and expressed a sense of pride in their work and accomplishments. In part, this was because they perceived their work as being "authentic."

One way that students framed authenticity was in relation to the products they created. In particular, they described that, unlike the typical assignments and projects they complete in school, the work they engaged in during this project resulted in artifacts that were used beyond the classroom. In addition to resulting in three exhibits (one at the Madison Children's Museum, one at a coffee shop, and one at our school) and a project website, the students' work also helped build a foundation for continuing this type of work with other students and teachers – e.g., the students helped improve the activities, and Molly helped Robyn and me present the project at a social studies conference. In addition, there were other, less visible, outcomes. For example, the

students' work increased other people's understanding of our school; helped connect other community members with each other (e.g., I did not know Todd O. before this project, but am currently planning a new collaboration with him); and strengthened our relationship with the Madison Children's Museum, and several other local organizations and businesses.

Another factor that led students to see their work as authentic was their sense that they were doing something important by representing local, everyday artists. As the students got to know the artists better, they became more interested in sharing their stories and promoting their work. This was especially true for Molly, who felt a strong responsibility to thoroughly represent Todd O., the fly fisherman because he was so passionate about his work:

> I thought that interview aspect really helped because I felt connected to it through him. I was like, 'Let's say this was me and if I made jewelry or something and some kids came in, I would want them to do the best job they could about something I loved.' That helped me stay focused. I wanted to learn about this because this guy is nuts about it. I think the interviews were super important for that and really helped a lot . . . I would feel bad if someone came in to tell stuff about me and then their exhibit looked like crap or something. You would feel this is something that is super important to me and these kids just totally half assed this. I felt it was a respect thing and also just trying to honor something that is so important to somebody. I thought it was helpful and thought if he were to see this, is it something that I would present to him and have him be like, wow, you guys really captured it. Or would he look at it and be disappointed. So I just kept that mind-state. I thought that was important.

Another key aspect of Molly's experience was that she enjoyed learning about Todd O. and spending time in his shop. In this regard, the project was authentic to her because it involved doing something that was a natural extension of her interests and ways of interacting with the world:

> I'm a social person and I love interviews. I love one-on-one things with people. I like digging deeper into stuff and having conversations with people and hearing someone talk about something that they are super passionate about. You can tell they are really happy that someone has given them the opportunity to talk about something that they probably don't get asked a lot about. Todd loves what he does but I doubt people come in all the time and say tell me about this. How did this happen? What is this? Digging into it. So it's cool seeing how positive and willing people were to help with this because it was cool for them too and they thought it was really neat. I thought it was cool to have that experience.

Finally, the students discussed how the activities they engaged in, the roles they took on, and the interactions they had, were authentic, particularly in relation to past learning experiences. Throughout the project, students worked as ethnographers and consultants, and engaged in "real world" fieldwork and design activities. As a result, they took on new identities and engaged in tasks that made them feel like they were not simply "doing school." For example, Mikhaila mentioned that interviewing people made her feel "more professional," and Courtney said a similar thing about working with the museum: "I felt really professional going into the Children's Museum because I actually had something to put there, not to just look at the exhibits." Other students also mentioned their interactions with the Children's Museum as being both a highlight of the project and a key factor in why they perceived their work as being authentic:

> Usually when I go to the Children's Museum I'm with a whole bunch of kids and just playing around there. This time you're actually going behind the scenes, [and seeing] what we need to do to actually put something up there, not just to play around in there. – Courtney

> [I]t was useful and interesting to see people who design things on a daily basis give us feedback. – Haley

> I thought doing it with the museum was cool. You felt you were a part of something and that people were interested in what you're doing and took time out of their day. It felt cool doing something bigger than just a class thing. I thought it was neat. – Molly

Learning curve: New *iterative* design practices

> Now I know if I'm doing something like this again, it's okay to present something right away that is rough – this is what I'm throwing out there. Then all it takes is a pencil mark to change something. I think that was definitely helpful, probably one of the most helpful things, that it's okay to not have it be perfect when you're just presenting something. I thought that was really helpful. – Molly

Engaging in "professional-like" design practices helped students develop their situated understanding of the *academic varieties of language* associated with design (Gee, 2004). It also provided them with a situated understanding of design and formal design processes. One of the major shifts that occurred in this area was in relation to students' understanding of iterative design and the role that "iteration-oriented" design artifacts, such as mock-ups and prototypes, play in the design process. In addition to being able to more effectively articulate this understanding in discussions, and use specific examples to ground and support their thinking, the students showed growth in two other related areas: (1) there was a shift in their mindset as they became more open to and comfortable with experimentation, "playing around with ideas," making mistakes, and getting feedback; and (2) the strategies and language students used to develop and share their prototypes changed as the project unfolded, often in response to specific design experiences (e.g, as referenced earlier in this section the students changed their strategies after their initial visit to the museum).

Some of these changes were evident in how students talked about the design process. For example, Haley said that one of her main takeaways was: "That you need to make mistakes before you have your final product. That getting opinions from people early is better, and to not make [the early versions] too elaborate, and to start simple."

Similarly, when I interviewed Courtney about what she learned through the project, she discussed the importance of making prototypes:

> Courtney: You have to test early and often, and make a lot of prototypes. I learned not to overdo it on the first try. Some of it is not necessary and wastes time if it's only going to be the rough draft anyways.
>
> Me: Why is prototyping important?
>
> Courtney: Because you have to fix your mistakes and stuff. You don't want to have the last draft full of mistakes. If you have a lot of prototypes, you have a lot of room to fix it. If you do make a mistake, someone will most likely correct it or you'll correct it yourself so the end result won't be crappy.
>
> Me: Can you talk about how that applies to the specific project that you worked on?
>
> Courtney: I think the first draft me and Haley did, we didn't need to do as much. I think we almost did too much. If we had gone a step further it would have been a waste of time trying to make it too professional. It was our first draft so it's not going anywhere.

While students' awareness of these concepts changed, it was not always easy for them to modify their practices. In reflecting on her experience building mock-ups, Molly described that it was strange for her to present something that, from her perspective, didn't look good or was unfinished. Doing so required her to develop a new mindset, and focus less on the visual aspects of her presentation, and more on using her mock-up to improve her ideas:

> It's scary at first to present something that I didn't feel looked good, when now I realize it's more about presenting the concept, not always the visual of it. You can still break it down that this is this and it's going to be this – 'This is my placeholder, but it's going to be this.' I learned it's ok to have a simple form of something. It doesn't mean that you didn't try. It just would have made the critiques easier. Then I would be like, 'Okay, I put all this stuff here and now you're telling me I have to peel this off.' . . . Next time I'm doing something like this, it's ok to have a mock-up. If they tell me you need to get rid of that and get rid of that. I'm like, 'I spent four hours on that.'

Over time, Molly, and the other students began to more clearly see their mock-ups and prototypes as representations of evolving designs and concepts, rather than final products – as a progression from “roughness,” larger concepts, and core functionality, to more “completeness,” refinement, and greater levels of detail. In concert with this shift, they also began using different design strategies and practices to create their artifacts, such as reducing fidelity in order to save time and other resources (e.g., using stand-in visuals and materials in early iterations of an idea).

Despite these shifts, throughout the project, there was a gap between students’ ability to articulate the importance of using an iterative design process (including testing ideas and getting feedback from others), and their ability to employ it. We identified a confluence of factors that contributed to this, including: (1) limitations in students’ previous experience using iteration and critiques as methods for improving their work; (2) variation in the motivations students had for improving their work (e.g., engaging in critiques in order to become a better photographer is different than engaging in them because it is required); (3) the degree to which students could make changes to their work without having to do major overhauls; and (4) the degree to which students felt comfortable and safe giving and receiving feedback.

CHAPTER SIX: PLACE-BASED DESIGN

In this chapter I combine key components of the two designed cases, along with the research presented in my literature review, to develop and articulate an initial version of Place-based Design – including the key goals, values, methods, and design principles. I also highlight several implementation issues that should be considered when using Place-based Design to guide instruction in a classroom setting.

Opening Notes

Unlike a descriptive theory, which seeks to describe something that actually exists and emphasizes cause-effect relationships, Place-based Design is an instructional theory aimed at facilitating *generative outcomes* – "assisting in the creation of something" (Reigeluth & Carr-Chellman, 2009, p. 7). As such, Place-based Design is not intended to be a framework that can be "laid down," but rather a reference model that can be used by others to design and implement place-based educational experiences (Lee & Kolodner, 2011; Lee, Koper, Kommers, & Hedberg, 2008). Additionally, the version presented here is intended as a tentative version that requires modification and refinement based on further research.[14]

Overview

Place-based Design brings together key components of place-based, design-based, and democratic education. While each of these educational approaches has its own instructional theories associated with it, when combined they produce a particular pedagogical framework that is more than the sum of its individual parts. As a result,

[14] Place-based Design is presented here in a manner that is consistent with how instructional design theories are presented in Reigeluth & Carr-Chellman (2009).

while sharing some characteristics with other instructional-design theories, Place-based Design represents a unique set of goals, values, methods, and conditions. Also, while Place-based Design is broken into separate components here, it is important to note that implementing this approach – as demonstrated in the designed cases – is a holistic endeavor.

Goal: What is the overarching aim of the theory?

Place-based Design is an instructional theory intended to guide teachers as they plan and implement place-based learning experiences that emphasize democratic participation and engage learners in iterative cycles of community-based inquiry and design.

Pre-conditions: What are the pre-conditions for determining when to use the theory?

Place-based Design is an instructional theory for situations where place-based learning is valued and learners and educators want to engage in inquiry and design tied to local cultural and ecological systems. It is appropriate for situations where place-based inquiry and design emerges from lines of inquiry and challenges that are open-ended and do not have a single solution.

Content: The nature of what is to be learned. Defined comprehensively to not only include knowledge, skills, and understandings, but also higher-order thinking skills, metacognitive skills, attitudes, values, etc. (Reigeluth & Carr-Chellman, 2009a).

- Questions, concepts, skills, etc. emerge from the particularities of the local community, the unique nature of the design challenge, and the individual and collective needs and interests of the learners, community partners, and teachers.
- Focuses on inter- and co-dependence between various local ecological and cultural systems.

Learners: The nature of the learner, including prior knowledge, learning styles, learning strategies, motivations, interests, etc. (Reigeluth & Carr-Chellman, 2009a).

- Students and teachers are receptive to this approach to learning and are willing to accept and adopt shifting roles and power relationships.
- Seeks to identify, leverage, and build on learners' and teachers' prior skills, knowledge, networks and interests.
- Emphasizes self-regulation, but realizes some learners may struggle with this.

Values (beliefs about what is important):

Values about ends (learning goals)

- Cultivate learners' awareness of the resources, assets, and needs in their community.
- Develop learners' sense of care for their local community.
- Allow space for students to critically reflect on, engage in deliberation about, and challenge the norms and values of their community.
- Place-based experiences are both an end, and a means for reaching larger or more abstract learning goals.
- Authentic design experiences are both an end, and a means for reaching larger or more abstract learning goals.
- Focus is on growth from where students started.
- Emphasis on learning how to learn and increased ability to work independently and collaboratively.

Values about priorities (criteria for successful instruction)

- Depth versus breadth of content and understanding.
- Effectiveness and appeal are valued over efficiency.
- Work should be emotionally and personally rewarding for students and teachers.
- Inquiry and design experiences generate new questions and opportunities for learning.
- Concepts and activities are appropriately challenging.
- Students have opportunities to follow their own interests and questions.
- Encourages students to identify new interests and talents.
- Learners engage in "real world" investigations, inquiry, design and problem solving.
- Students take on "real world" identities and community roles.
- Learners produce and share new knowledge.

Values about means (instructional methods)

- Emphasizes place-based field experiences.
- Use of complex, authentic inquiries and design challenges with no right answer or single solution.
- Appropriately structured design challenges based on learners' needs – e.g., while ill-defined problems might be preferred, learners may need to work through a series of more defined problems and activities to prepare them for more open-ended challenges.
- Use of ritualized activity structures (e.g., processes and methods) to support students' learning.
- Use of material artifacts and structured feedback/critique sessions to help learners make their thinking explicit, reflect on what they learned, and

integrate their new experiences and knowledge with their existing mental models.
- Teachers (including community members) as facilitators, co-learners, and metacognitive coaches.
- Opportunities for ongoing, participatory and authentic feedback and assessment.
- Consistent check-ins and reflection to monitor, solicit, and respond to students' questions, interests, and concerns.

Values about power (to make decisions about the previous three)

- Promotes student ownership and control.
- Instructional design should be a collaborative effort and students should be involved in making decisions about the learning trajectory, including content and methods.
- Students should be encouraged to take on more responsibility for directing and managing their own learning.
- Teachers and students should work together to reflect on and improve the learning environment and experiences.
- Design outcomes are co-owned by the learner and community partners and/or other collaborators.

Methods:

Universal Methods:

- Select generative design challenges and problem spaces.
- Engage students in co-designing their individual and collective learning experiences and trajectories.
- Engage learners in "low stakes" field-based experiences that bring to light their interests, questions, and understandings.
- Provide space for students to "mess about."
- Provide coaching and direct-instruction in situ.
- Coach the learner by providing prompts and monitoring aimed at regulating their performance, provoking reflection, and/or challenging their conceptual understanding.
- Embed opportunities for ongoing individual and group reflection.

Scope of Methods

According to Reigeluth and Carr-Chellman (2009) the scope of a method is the amount of instruction with which a method deals. This can be at various levels: the micro (instruction on an individual skill or understanding), meso (instruction on a single

unit, or cluster of related skills or understandings); or macro level (instruction on a course or curriculum, such as a sequence of different types of complex tasks) (p. 21). While the Place-based Design can be implemented at the meso level, it is designed for use at the macro level. Additionally, it is designed to breathe and adjust based on students' needs, prior knowledge and experiences. For example, students might need less or different types of scaffolding as they develop their understanding of and ability to apply different design processes and methods. On the other hand, the framework can also be modified to guide students who need additional support to help them regulate their own learning (e.g., identifying and setting learning goals, self-monitoring, etc.).

Universal Principles for Place-based Design

Principle 1: Emphasize place-based learning experiences

Place-based inquiry and design experiences contextualize learning around local cultural and ecological systems, increase student engagement, and improve academic achievement (Smith & Sobel, 2010). Learning goals and curricular activities within Place-based Design should emerge in part from local themes, systems, content, and needs, and provide entry points for ethical, ecological, cultural, and personal considerations of place (Gruenewald, 2008). Students' inquiry and design activities should take them out of the classroom (e.g., into the schoolyard and/or local community) in order to conduct authentic research and design activities, collaborate with community partners, and share their work. These experiences should provide students with opportunities to take on new community roles and engage with people and places in new ways. In addition to raising their understanding and awareness of

local people, places, and issues, place-based learning experiences should be designed to increase students' care for the past, present, and future of their community.

Principle 2: Structure learning around authentic design challenges and experiences

Like locally focused inquiry, design-based activities help anchor and contextualize students' understanding of key content and concepts. In this light, place-based design challenges should be used as both a method for engaging students in thinking more critically about their community and as a vehicle for learning about design. In order to situate their understanding of formal design processes and methods, students must have opportunities to engage in meaningful design Discourses (Gee, 2004). As a result, a significant amount of students' work should engage them in solving authentic design challenges that involve "real world" roles, practices, processes, audiences and products. Engaging students in design should be done in the service of nurturing their identity(-ies) as designers and developing their designer mindset (Gee, 2007, Games & Squire, 2008; Stable, 2008).

Principle 3: Use ritualized activity structures to support students as they learn through and about design

Solving open-ended and ill-defined design challenges requires learners to integrate and successfully employ a range of design processes and methods, while simultaneously engaging with complex, and often new, content and domain specific concepts (Kolodner & Gray, 2002). To help students manage the degree of ambiguity and difficulty associated with solving ill-defined design challenges, teachers should establish ritualized activity structures and routines (e.g., ritualized processes, methods,

and protocols) to support students' design work and progress towards learning goals. Over time, as students transition from novice to more expert designers, and develop their knowledge of, and ability to employ formal design processes and strategies on their own, these structures and routines can be adjusted to allow for more complexity and student autonomy.

Principle 4: Cultivate a democratic learning community that promotes participation, inclusiveness, and ownership

Place-based Design is rooted in a belief that students should be involved in determining what they learn, and how they learn it. As such, teachers should develop and maintain democratic structures, processes, and experiences that provide opportunities for students to share their perspectives, collaboratively solve problems, and co-design course activities. Additionally, the curriculum and curricular activities should be designed to allow students to follow their interests, develop their own lines of inquiry, and create their own learning trajectories, both individually and collectively. In order to support these goals, it is critical to cultivate a learning environment where all members feel safe sharing their talents, interests, and perspectives, engaging in deliberation, and advocating for themselves.

Principle 5: Engage students in addressing community needs and interests

A key goal of place-based and democratic education is developing students' capacity for engaging in locally focused civic action. In part, this goal is rooted in the belief that students are presently capable of, and already are, engaging in the civic fabric of their community. This perspective aligns closely with Lay and Biesta's (2006) model of *citizenship-as-practice*, which emphasizes that citizenship is not a

predetermined set of knowledge that can be disseminated to students, but rather something that is situated in day-to-day interactions, choices, and dispositions. In other words, it is not sufficient for students to read about, or hear others talk about local democratic systems and practices – they need opportunities to have "firsthand experience[s] of local life" (Gruenewald, 2003a, p.620) through which they can activate and develop the skills, practices, and ethos associated with responsible community engagement (Gruenewald & Smith, 2008). As a result, students' inquiry and design work should provide opportunities for them to participate in civic actions that shape the present and future of their community.

Principle 6: Generate inquiry and design challenges that meet curricular goals, but also encourage emergent and interdisciplinary learning opportunities

Helping students understand the complexity and dynamic interconnectedness of local systems requires an educational approach that is itself, integrated and multi-disciplinary. As a result, while being cognizant of larger curricular goals and graduation standards, teachers should promote multi-disciplinary inquiries that emerge from the particularities of the local community, and the unique nature of students' integrated inquiry and design work. According to Smith and Sobel (2010), place-based education should "encourage educators to look beyond the language and methods of their own fields to explore problems and projects that open the possibility of cross-disciplinary dialogue" (p. 23) in a way that helps students "grapple with the messy cross-disciplinary nature of humankind's current dilemmas" (pp. 21-22). Strategies for supporting this goal include: (1) Selecting generative design challenges that are holistic and don't have a single, right answer or solution; (2) Developing learning activities that allow for emergent

interactions, experiences, and lines of inquiry; and (3) Structuring learning around "deep dives" that foreground depth over breadth.

Principle 7: Use individual and group reflection to help students monitor their progress and integrate new knowledge and experiences

Teachers should routinely facilitate reflection during and after key learning activities in order to help students integrate their new knowledge and experiences into their existing mental models. Reflection should be done both individually and collectively, and be driven by clear protocols and guiding questions, such as: What happened? Why did it happen? What have I learned? How would I apply this learning to future experiences? (Lindsey and Berger, 2009, pp. 128-129). Time should also be dedicated to reflecting on the learning environment as a whole, with an eye on how to improve students' learning experiences. Finally, reflection should be used as a method to help students make connections between individual activities and the larger trajectory of the course or project. This is especially true in situations where students are unfamiliar with emergent learning and might be uncomfortable with ambiguity and uncertainty – e.g., they may be used to more traditional classroom settings, where the trajectory is clearly mapped out and teachers maintain executive control of the key decisions.

Strategies for Broad Level Planning

At the broadest level Place-based Design brings together three interrelated components: (1) a general area of interest or line of inquiry; (2) a place(s) or site(s) of inquiry; and (3) a central design challenge. These components interact with each other

to create the initial questions, content, concepts, activities, and interactions that frame and guide students' inquiry and design work.

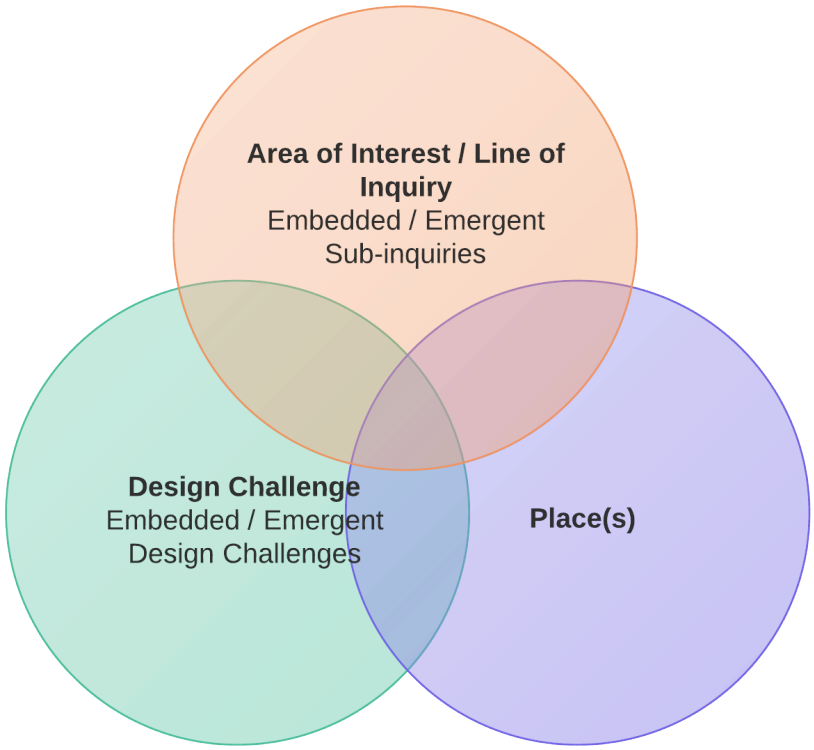


Figure 34. Key components for planning with Place-based Design.

In most traditional school settings, each of these components is determined ahead of time by a teacher. With Place-based Design, this process is more inclusive and involves deliberation and collaborative decision-making among students, teachers, and community partners.[15] Additionally, because Place-based Design emphasizes emergent learning opportunities, one or more of these three components may not be defined, or clearly defined at the start. For example, a class may have decided they

[15] While the degree to which students are involved in making key decisions about each of these components will vary based on the peculiarities of the setting or context (e.g., students' abilities, time, curricular goals, etc.) a key goal should be maximizing students' voice in the decision-making process throughout the intervention. Teachers should also make efforts to make the decisions they make transparent, so that students understand the rationale behind them.

want to study a particular place, but not yet agreed on or discovered "the right" design challenge. Similarly, a group of learners might have decided they want to engage in a project involving a particular technology or medium (e.g., video, writing, or photography), but not have a specific area of inquiry or place in mind.

Implementation Issues

Limitations in students' prior experience engaging in formal design practices

Because Place-based Design presents a learning approach that differs from their typical school experience, many students may find it difficult to acclimate to this setting. This is not surprising considering that learning in this way requires new behaviors, practices, identities, etc. As a result, it is important to develop design challenges that are appropriately challenging based on students' abilities, interests, and prior knowledge. Additionally, the degree and types of scaffolding used to support students' design activities should align with their level of expertise.

Engaging in Place-based Design with limited resources

The cases in this study occurred in settings where technology and transportation were readily accessible. In cases where this is not the norm, the types and location of community-based explorations may need to be adjusted to align with local needs. One strategy that can address this issue is focusing students' inquiry and design on issues in the immediate vicinity of the school, or in the school itself. Another option is to have students conduct field research outside of school – particularly, in their own neighborhoods or in relation to their own families. Similarly, design challenges should be adjusted to align with the technological resources available to teachers and students.

While both of the cases in this study relied on mobile devices, digital technologies are not required as part of students' inquiry or design.

Maintaining focus and staying motivated

Students may have difficulty maintaining focus and staying motivated during sustained investigations and design challenges. This occurred in both of the cases included in this study, as students' interest in the project overall, and/or their commitment to completing particular activities ebbed and flowed over time. In order to respond to individual students and the class as a whole, teachers should make efforts to monitor these shifts and openly discuss students' engagement levels.

Difficulty with shifting roles

As part of their inquiry and design work, students are expected to take on new roles and responsibilities and be more actively engaged in managing their own learning. They are also expected to accept more risks, as they collaborate with community members and produce work that is shared outside of the classroom. Because these changes disrupt "business as usual," they can be anxiety provoking, and even lead to resistance. Openly discussing their emotional reactions to these shifting roles can help reduce students' anxiety, and provide teachers with insight into what changes they might make to better meet students' needs.

Ease students into critical inquiry

Place-Based Design allows space for students to critically reflect on, engage in deliberation about, and challenge the norms and values of their community. It is important to acknowledge, however, that some students may not necessarily be

interested in or prepared to critically reflect on their own perspectives, values, and community. This is particularly important when their identity is associated with the places or cultural patterns that are being analyzed or challenged. In the Everyday Art project, for example, discussing concepts such as buying local products, or exploring the difference between mainstream marketing and localized marketing ran counter to and challenged some of the students' own buying practices and values.

Conclusion

The goals, values, methods, and principles outlined in this chapter represent a new instructional design theory called Place-based Design, that was heavily influenced by research and practice in place-based, design-based, and democratic education. Place-based Design is intended to guide teachers as they plan and implement place-based learning experiences that emphasize community-based inquiry and design. Because this is an early iteration of Place-based Design, it is expected that it will be modified and refined based on future instantiations and feedback from educators, as well as through more formal research studies. This is especially true considering that the cases don't represent the range of situations in which the theory might be applied, and more research is needed to refine the model across additional contexts.

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