Design for the Soul of the Community: Using Community-based Design Principles

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***Abstract* - The Louisiana State University Community Playground Project (LSUCPP) employs community-based design techniques in which college students in biological engineering work with community constituents, especially children, to design and build playgrounds that reflect the unique aspects of the broader community that the playground will serve. In practicing a community-based design process, members of LSUCPP realized that there is a dearth of literature in this area. Therefore, members sought to develop an initial set of community-based design principles and best practices that engineering practitioners can use in their own community-based design endeavors. The team completed brainstorming and concept mapping exercises using a combination of individual and group techniques to create an initial set of 25 community-based design principles. Further discussion and concept mapping resulted in a framework for these 25 principles, which are organized into two major themes, Community-Based Design Principles of Practice, and Community-Based Design Principles of Conduct. The LSUCPP members believe that each of these principles supports the overall goal of community-based design: to express “the Soul of the Community” through co-created artifacts.**

Index Terms – Community-based design, engineering design principles, service-learning in engineering, soul of the community

INTRODUCTION

Since 1998, the LSUCPP has existed to build safe, accessible playgrounds and bright futures for local public school children through partnerships with public schools and related organizations in and around Baton Rouge, LA.

The LSUCPP is associated with a required, first-year design course in biological engineering, BE 1252: Biology in Engineering. This course is taught using a service-learning approach, in which engineering students work with a community partner (usually a local public school) to address a community need (access to playgrounds). In the course, college students partner with elementary school students enrolled at schools of diverse populations to co-design a playground for the school. The LSUCPP Research and Design Team, consisting of students who have completed the course and who show an interest in engineering and community, takes the design concepts completed for the course and continues to work with each school in a project management capacity to finalize, fund, and use a volunteer build process to complete the playground.^{1,2}

The LSUCPP Research and Design Team has continued to fine-tune the design process, but in seeking literature on community-based engineering design principles, the team found this topic lacking in engineering literature, though significant work on service-learning in engineering has been published. Coyle et al. identified the need for service-learning, both in academia and the community, and described the establishment of Engineering Projects in

Community Service (EPICS) at Purdue University.³ Begun in 1995, EPICS is recognized as the first service-learning in engineering program, and the EPICS model is widely used today in high schools and universities around the world.⁴ Further detailing the need for service-learning is a study by Gokhale et al., which shows that service-learning helps students to develop a sense of social awareness.⁵ Other studies, like those by Duffy et al. and Padmanabhan and Katti define service-learning, help readers to identify situations in which community-based design is executable, and present the incorporation of such community-based projects at ABET-accredited Universities and Colleges.^{6, 7} Together, these studies and others express the need for community-based design and detail the broad implementation of it in US engineering programs. Yet, we could not find explicitly defined or compiled community-based design principles.

As a result of the rising presence of community-based design and the absence of community-based design principles in engineering literature, members of the LSUCPP developed a “first draft” set of community-based design principles and practices. The co-authors of this paper are former and current LSUCPP Research and Design Team members who worked together over the course of several years to create the community-based design principles presented below. These principles were developed based on members’ experiences as a part of the LSUCPP, though each member has had additional participation in service-learning, research, and civic engagement (Engineers Without Borders, Study Abroad, etc.) activities. While the principles are presented and briefly discussed below in the context of existing literature on humanitarian engineering and social justice in engineering, as well as in the context of experiences of the LSUCPP, we believe that these community-based design principles are generalizable across design-based disciplines. We intend these principles to serve as a starting point for future research, discussion, and collaboration focusing on community-based design.

METHODS

The team used brainstorming exercises in which individual members drew on their experiences to generate ideas on best practices in working with communities to effect positive change. Each team member placed individual ideas on Post-it® notes which were attached to a large working board in the LSUCPP design laboratory. Team members took turns placing their ideas on the board, including duplicate ideas, until all ideas were posted. The team then completed further brainstorming exercises using the SCAMPER method⁸, in which additional brainstorms were completed in thinking about how principles might change when considering the following: substitute; combine; adapt; modify, minify, maxify; put to other uses; eliminate; reverse. This combination of individual and group brainstorming methods resulted in an initial set of community-based design principles. After these exercises, the team used concept mapping and on-going, reflective discussion to organize the principles in a cohesive way, with an overarching framework that some principles involved practice (what to do) and others involved conduct (how to do it). Although this process is presented succinctly, the actual process was not; multiple iterations ensued on the concept map and the best way to group and describe the principles.

Our initial set of 25 community-based design principles was:

1. Spend time in the community to understand history, desires, needs, and aspirations
2. Define clearly and collaboratively how the design will affect the community

3. Find and incorporate the *Soul of the Community* in the design
4. Engage with the community to recognize and contextualize constraints
5. Remember that the design is for the community, not you.
6. Engage in activities to maintain interest/buy-in of all constituents throughout the design process
7. Actively listen
8. Be prepared to deal with differences
9. Be careful with the use of language (design with, not for; assets, not deficits, etc.)
10. Seek insight outside your field of expertise
11. Remember that the community is the expert
12. Be aware of the image you portray (facilitator and learner versus. expert and savior)
13. Ask: Do they need you or just money?
14. Identify available resources
15. Practice active reflection throughout the project
16. Take pride in your project (without taking over it)
17. Dedicate a creative space for discussion
18. Diligently record the design process
19. Revise and execute the design together (or transparently if together is not possible)
20. Exercise caution in making assumptions
21. Have a discussion about guiding design principles
22. Establish positive power dynamics
23. Realize that collaborative design is a marathon, not a sprint
24. Recognize that you can't please everyone
25. Accept that there is no such thing as a perfect solution

As in any group setting, there were different thoughts and ideas about the number of design principles, their descriptions, and how to describe the overarching design theme. Over the course of approximately 18 months of on-going discussion, concept mapping, reflection, and group consensus, the 25 design principles were organized into a framework of five overarching design principles of equal importance, presented in Figure 1.

The five over-arching community-based design principles are:

Community-Based Design Principles of Practice

- Recognize and Define the Purposes of the Project and its Impacts
- Incorporate the *Soul of the Community* in the design

Community-Based Design Principles of Conduct

- Define Roles
- Listen Contextually
- Take Action Together

These principles are discussed in narrative form below and are shared in hope that engineers and other designers can use them in their own community-based design efforts.

FIGURE 1

CONCEPT MAP USED TO GROUP THE INITIAL 25 COMMUNITY-BASED DESIGN PRINCIPLES INTO THE FIVE COMMUNITY-BASED DESIGN PRINCIPLES.

RESULTS

The resulting community-based design principles are further discussed within the framework of principles of practice and principles of conduct. Several themes of the original 25 principles are highlighted throughout, especially those principles identified as the most difficult (or nuanced) to practice (3, 5, 11, 16, 20, 24). These nuanced principles should be most strongly considered by designers who endeavor to practice effective community-based design, and are further discussed in subsequent sections.

COMMUNITY-BASED DESIGN PRINCIPLES OF PRACTICE

Recognize and Define the Purposes of the Project and its Impacts

It's Obvious: Manifest Purposes and Impacts. The most concrete action of community-based design is defining the manifest purposes and impacts of a project, those that are immediately obvious. Notice that *defining the project* is the first step, rather than *identifying the problem*. We believe that the approach to community-based design should be about effecting positive change rather than defining and proceeding to solve a problem. Abraham Maslow said, “I suppose it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail.”⁹ A focus solely on problem solving is analogous to an engineer approaching every problem with a hammer; effecting positive change requires additional tools. The engineering profession tends

to focus on the technological aspects of problem-solving and lends less credence to human dimensions and capacities.¹⁰ An overreliance on limited methods of practice (problem-solving with an over-reliance on technology) can lead to improperly “solved” problems, unanticipated impacts, and alienation of the community.¹¹

Engineers and community members can use brainstorming and on-going conversation to characterize the goals and impacts of a project. In our case, we start with the goal of providing a safe, fun, accessible play space within a specific community. Concrete aspects involve budget, capacity, landscape analysis, safety and accessibility standards, recommendations, guidelines, layout, “fun factor,” etc. A central part of defining the project involves repeated, face-to-face conversations with the children who co-design this playground based on about their thoughts, ideas, and inspirations about playgrounds, as well as about how, where, and why they play. Children are the true experts at play, and getting their expertise is fundamental to beginning a design that will successfully effect the positive changes set forth by the community.

Hidden Meaning: Latent Purposes and Impacts. In our experience, what is said during conversations to define the purposes and impacts of a project is important, but oftentimes, what is not said or communicated can be equally or even more important. Latent purposes and impacts of a project are those not explicitly stated, either at all or at the beginning of a collaboration. To be identified, latent purposes and impacts of a project usually must be determined through ample interaction, by careful thought and reflection, and by building trust between community and designers. Satisfactorily considering these purposes and impacts are often what make the most difference in a community.

For example, when a playground is built for a school, it is built as an outlet for physical activity and play. However, the latent purposes of a playground extend much further. Well-designed playgrounds help to foster socialization, creativity, and inclusion among the students who play on it. An activity outlet is a manifest purpose in playground design; seeking to provide an environment in which children can dream, create, aspire, and grow may not initially be as obvious, but is also critically important. Identifying latent purposes can help to give greater meaning to a project. This greater meaning is typically specific to a community.

At times, engineers approach a community with answers to incorrectly framed questions, unasked questions, or without even knowing what the questions are. This approach is a mistake. When working with the community to identify manifest and latent purposes and impacts of a project, it is essential to include all members of the community, who provide both expertise and insight, through active engagement. It is imperative for designers to contextually listen¹² with both ears and heart¹³ to fully grasp the latent purposes and impacts of the project in addition to the manifest ones. The most important part of successfully capturing all the purposes and impacts of a project through community-based design is to maintain a consistent line of connection with the community. A mutual view of the community as a special, unique, and important place is essential to capture.

Incorporating the Soul of Community in Design

Definition. A community is defined as a “social group of any size...with a specific locality...and common cultural and historical heritage.”¹⁴ Of the details outlined in that definition, we believe it is important to keep in mind that a community, at its base, is a group of individuals, each of whom bring unique and distinct histories and characteristics to the community of which they are

part. Together, these individuals form a social structure with its own unique identity, history, culture, and spirit. These individuals also occupy a physical place, which must be honored through design. This essence is what the LSUCPP refers to as the *Soul of the Community*, and it provides the absolute foundation for all community designs.

Crucial to successfully defining the *Soul of the Community* is emphasizing the uniqueness in each community and what makes it special. Just as each person is distinctive from any other person, each community, comprised of numerous people, is unlike any other. For this reason, there is no universal method for defining the *Soul of the Community*, but there are ways to develop skills and to prime one's heart to recognize it. Catalano and Baillie¹⁵ emphasize that engineering should be practiced in regards to the "communion of subjects" of the world. Recognizing a community as a "communion of subjects" ensures an understanding of the individualities present within it and makes aware the unique nature of that community. As Catalano and Baillie discuss, approaching a community with this mindset becomes critical for service to that community.¹⁵

Discovering the Soul of the Community and expressing it through design. The paramount principle in recognizing the *Soul of the Community* is leaving behind all pre-conceived beliefs about the community, as assumptions can disguise a community's true nature. Immersing one's self within the community is one major way to find its soul (another is to listen contextually, discussed below). One should spend time with the people in the community and learn about their history, culture, hopes, and daily life. As stated by Leydens and Lucena¹⁶, "If development is something done with—not to—a community, it requires heightened awareness of salient uniquenesses in community contexts, such as culture, gender, race/ethnicity, historical experiences with development, and more." Taking the time to identify and incorporate the *Soul of the Community* into designs makes a design more personal and enhances the sense of accomplishment for everyone involved.

The *Soul of the Community* can be expressed in many ways. One manifest way is through symbols that have meaning for a community, for example, incorporating the mascot and school colors into the design of a school playground. While this is good practice, we believe it is important to aspire to deeper meanings. To illustrate why, consider the question we ask ourselves: if we try to explain to someone why LSU is so special to us, would our answer be purple and gold (LSU school colors), and the tiger (our mascot)? Our answers to this question are more rooted than just our school colors and mascot; we endeavor to ask and answer questions about the deeper meanings of community, and then include design elements that reflect these deeper meanings.

For example, we collaborated with two community groups on opposite banks (east and west) of the Mississippi River; the east bank community had ample playgrounds and resources while the west bank community did not. These groups were united in a goal to design, fund, and build a playground in a "play desert" on the west bank of the river. To illustrate these communities' connection and what makes them unique, we designed a playground that incorporated a composite play structure (large play house) spanned by a bridge, and under that bridge, we specified blue surfacing in the shape of a meandering river. The design captured what the communities saw as a definitive feature of their landscape (the river) and symbolized their collaborative work across geographical and socioeconomic boundaries (the bridge).

The *Soul of the Community* might be expressed through design by including elements (typical or atypical) that involve a theme or that pay homage to cultural or historical aspects of the community. However, sometimes the result of capturing the *Soul of the Community* is not

something that may be evident to someone not involved in the collaboration. For example, one collaboration between the LSUCPP and a local elementary school led to the realization that the *Soul of the Community* was the strong social bonds among the children at the school. This soul was incorporated into the design by choosing play elements that focused on interaction and teamwork for the children, for example, double slides so that children could slide together, or a large climber specified by the children so that they could climb together and “hang out” at the top, as well as platforms (on the ground through a stage, and elevated) and places like picnic tables and benches under trees that invited children to gather.

Finally, sometimes the *Soul of the Community* involves not what one “adds” to a design, but what one “leaves alone.” Members of the LSUCPP once worked with a local school to upgrade a play area for pre-kindergarten children. Upon visiting the play site, LSUCPP found some old equipment, including a rusty gate in the middle of the area, not near any other equipment. The team members dubbed this piece of equipment “the Gate to Nowhere” and assumed that the school wanted the gate and the rest of the equipment removed to make way for new equipment. Months later, when the team asked about the rusty gate, the principal explained that the gate was the students’ favorite piece of equipment. At recess, teachers would line up their students in front of the gate and would tell the students to shut their eyes and imagine a place they wanted to go. When each child had thought of a place, they ran through the gate and screamed the name of the place they were going as they ran through it. This activity was the children’s favorite thing to do on the playground; though there was a “better” playground right next door that was separated by a fence topped with barbed wire, the children were ecstatic with their gate and the adventure it represented. LSUCPP members were shaken that the equipment they had labeled “the Gate to Nowhere” was actually “the Portal to Anywhere.” In the final design, the portal remained and was the central piece of the playground. Recognizing the *Soul of the Community* became very clear after hearing the description of the gate: creativity on the part of the teachers and students, and the desire teachers had to encourage students to use their imaginations to play to the fullest despite their relative lack of equipment. Ample equipment was added to this playground but the focus on imagination and inspiration remained central.¹³

Summary

The *Soul of the Community* is not something to be figuratively constructed by designers. To say the *Soul of the Community* is found by designers is to disregard the fact that the *Soul of the Community* is manifest in each community. The essence is something to be recognized, appreciated, and to prominently bear in mind during design. The most significant part of community-based design is capturing the *Soul of the Community* in the design, a process that takes time. The longer and more meaningfully engineers engage with their community, the easier it becomes to recognize and incorporate the *Soul of the Community* into design. Community-based designs should be unique because they contain elements specific to that particular community. Lastly, it is important for engineers to realize that the community is the expert in identifying and expressing the *Soul of the Community*. At times, we have directly asked, “What is the soul of this community?” and we have received some wonderful, insightful answers.

COMMUNITY-BASED DESIGN PRINCIPLES OF CONDUCT

Define Roles

A Community of Experts. Common opinions held by engineering students, faculty, and professionals include seeing the public as uninformed about engineering or design; being irrational and emotional; and having unrealistic expectations ^[18]. In reality, the expertise of the public is merely different than (and sometimes overlapping with) that of the engineer. One of the first steps when designing with the community is to define the roles of each person or group involved with the design process to foster an environment in which all individuals are valued for their expertise and contributions. The community is the expert and their ideas are paramount. Although the engineer has profession-specific expertise and experience, the community has a better understanding of place, history, soul of the community, needs, desires, aspirations, etc. Sometimes, the community has a better understanding of the artifact to be designed than the engineer, for example, with children and playgrounds. We believe that community-based design is a mutual teaching and learning process in which community members can learn about engineering design, and the engineer can learn about the community. This framework ensures that the expertise of everyone is taken into consideration as co-designers, instead of the community being considered “a user” of the design and the engineer “the designer.”

In our experience, different constituents have a different take on the playground design and all perspectives are important. The children, parents, teachers, and principal’s input are all important to consider. Each of these groups provide the LSUCPP a different take on what kind of equipment should be used and what is important in the design. For example, the children may want something tall and adventurous, the teachers may want a place to sit so that they can rest during recess, the principal may want a layout with a very clear line of sight (as well as no places to sit so that her/his teachers don’t rest during recess), and the physical education teacher might want equipment that encourages upper body strength. As a facilitator of design, an engineer must carefully listen to all ideas and try to understand the rationale behind them to work with the community to move a design concept from a strictly engineering viewpoint to a design which effectively addresses the perspectives of the constituencies and encompasses the essence of the community and their values. An engineer’s role is to communicate the information of which he or she is an expert, facilitate decision-making, advocate for the best design within the community, and respect the system, except in cases of social injustice, in which the engineer is co-designing.

Listen Contextually

Listening with the Ears and the Heart. A key aspect to community-based work is to actively listen, process, acknowledge, and honor each person’s (and each community’s) story, thoughts, ideas, and aspirations with an idea toward what is possible.¹⁶ Through contextual listening, basic project constraints are fully realized with an understanding of the context of the community that outlines them ^[17]. Listening contextually ensures that we listen carefully to what is being said (and what is not being said) and can seek deeper meaning and understanding together.

For example, when listening to children during the design process, children may request imaginative elements like a fast car, a fire-breathing dragon, a water roller-coaster, or a dog pen

so that everyone can bring their dogs to school and kids and dogs can play during recess. Such elements are not literally possible on a playground due to liability and feasibility issues. Through listening contextually and thinking about it from a child's perspective, an engineer might realize that such requests imply that a child is looking for an adventure in a playground. LSUCPP makes every effort to encompass the spirit of these dream play elements in subsequent designs, if not the actual elements in built form. If these elements do not exist in a physical form, the children are given the stage for their imagination to flourish; though we cannot allow a child to drive a race car on a race track, we can design a running track where the children can imagine themselves to be the race cars rounding the turn to win the championship. Conversely, when listening to adults describing their aspirations for a playground, requests generally center around safety and lists of what *not* to include. Without listening contextually, a designer might think the adults are appearing to diminish creativity, when in actuality, community adults are protective and concerned about the safety of their children. Many engineers recognize that the public is better able to provide contextualized information and identify their own needs and wants.¹⁹ Listening contextually and knowing the audience at hand allows for a stronger understanding of a community's desires and are of utmost importance when designing for a community.

Take Action Together

As previously discussed, the engineer spending time in the community is imperative in order to create a design that encompasses the needs, wants, and aspirations of the community. Canney finds that many engineers describe the ideal relationship between the engineer and "the public" to be "collaborative, with strong communication and where both parties are well informed."¹⁸ There are many ways to get to know the community, including interviews, meetings, conversation, and volunteering. In order to ensure that community members truly feel involved and appreciated during those times, a creative space should be designated for the project.

Dedication of Creative Space. A dedicated creative space is a place where all concepts for the design can be discussed among the community members and the engineers. An important aspect of the space is that no one person's ideas are more valuable than the others. For example, the LSUCPP's first step in the design of a community playground is to reach out to the community and designate a dedicated creative space in which children, parents, and professionals are encouraged to attend to voice their ideas for the playground and the *Soul of the Community*. This space typically is situated in the community (in our case, typically at the school). A dedicated creative space can also be the location at which the design is implemented. Most importantly, the creative space should be an open and judgment-free zone where members are willing to share their thoughts and ideas.

Dealing with Differences. In community-based design, it is inevitable that there will be differences in the ideas, aspirations, and goals of the design when situated within a community. Dealing with these differences effectively often comes down to effective communication. During a design process, contributors may have very different ideas for how to approach the design or its constraints. In order to resolve these differences, it may be best to dissociate oneself from their current stance and attempt to view different ideas objectively and equally. As a group, there should be an open discussion analyzing and comparing all ideas in order to find the "best, imperfect design" (imperfect because we realize that it is impossible to please every constituent 100%). For example, during a collaboration with a school, a conflict arose regarding the

incorporation of seating in a playground design. Several teachers wanted benches on the playground to rest during recess, while the principal was worried the presence of benches would encourage the students to be less active during recess. From a playground design standpoint, benches can be important platforms for imaginative play for children. Together, the LSUCPP and school constituents arrived at the best, imperfect design by placing a couple of benches in the playground in locations in which they would facilitate imaginative play for the children.

Decision-making: Who's Got the Power? Power imbalances exist, and engineers must be aware of them to be successful in community-based design. Leydens and Lucena encourage engineers to acknowledge political agency of a community, to co-identify structural conditions, and to mobilize power to complete a design.¹⁹ The LSUCPP recognizes the power of children (the true experts at play) while acknowledging our community's power structure (typically, final design decisions rest with the school principal); we realize that respect for the power structure in a community, in our case, is part of what will lead to the best, imperfect design.

As we design with the community, it is important to recognize that the community plays an agentic role in its development to meet its own needs.¹⁹ We have noticed that community members sometimes don't "own their power" or recognize their expertise. We make every effort to ensure that the teaching and learning in the community-based design process is egalitarian and that everyone understands their expertise. In our case, children are the experts at play. They are the play engineers. Teachers are the experts at children, and their insights on whole child development are critical for the success of the playgrounds. Principals are experts at the school system itself, while community members and parents surrounding the school provide expertise on the community. We are the experts on playground safety and design. Together, we share our expertise to forge a design together.

Summary

The aforementioned principles of conduct are important to ensure effective community-based design. Defining roles encourages each member of the design process to contribute according to his or her expertise. Contextual listening ensures mutual understanding of every contributor, regardless of the difference in views. Moreover, in practicing these two principles, the door is opened for all design-contributors to take action together in the practice of community-based design. Ultimate goals involve recognizing the unique expertise of each contributor, working to understand what is said (and not said), and ensuring that design is just, respectful, and community-based.

CONCLUSION AND FUTURE DIRECTIONS

The principles presented in this paper are not "the canon" of community-based design, but a starting point for further research, discussion, and collaboration. We represent one engineering discipline and have focused on the principles on community-based design in a single context, though we believe that the content of the principles are generalizable. We think that future research agendas and studies should involve all disciplines, inside and outside of engineering; we have learned substantially from landscape architects, K-12 and college teachers, anthropologists, community engagement experts, and others, along with community members

from all walks of life.

The application and impact of these principles within educational, professional, and international service-learning settings are future directions in which research could progress, as the LSUCPP believes in the broad applicability of these principles. The team has located information about community participation methods in other design-based disciplines, including architecture, landscape, and city planning.²⁰ Furthermore, organizations such as the International Association for Public Participation (IAP2) and the Civil Practices Network (CPN), as well as digital participation technologies, like Geospatial Surveys, Public Participation Geographic Information Systems (PPGIS), and Volunteered Geographic Information (VGI), exist to provide a bridge between professional designers and community members. Digital participation technologies (for communities with access to electrical power and computers) provide an accessible method of communication between design parties; individuals in the community voluntarily provide insight about their space and can voice their opinions regarding a proposed design for their community^[21]. These technologies could be useful especially in an international setting, where immersion in the community for an extended period of time may not be possible. Ultimately, the *Soul of the Community* emanates from the community, and it is the engineer's responsibility to assure due diligence of the community's desires, as well as to practice engineering as transparently as possible. Transparency ensures our approach is clear to the community and is practiced such that the community can participate as a co-designer through every step of the community-based design process.

Engineers are typically trained to find solutions to problems efficiently and within constraints. Some of these paradigms change when we purposefully engage in community-based design. Community-engaged engineers seek changes instead of solutions; recognize that efficiency has its limitations if it quiets community voices; and embrace complexity and "features of the community landscape" instead of cataloguing constraints. These engineers recognize that design should be inherently community-based, and in environments where design is for design's sake, these engineers seek to reject that concept and strive to find a translation of the community-based design principles that facilitate positive changes. While we agree that designs should be effective and efficient, it is the belief of the members of LSUCPP that design should be, above all else, completed with the people for whom the design will serve. We strive to be engineers who work with our communities to effect positive change in such a way that builds a creative space that produces designs and artifacts as well as engaged citizens who value each other on a journey envisioned by Dr. Martin Luther King Jr., to "bend that long arc" toward a more just, democratic, equal society.

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