AC 2012-5534: WHY THE HUMAN CONNECTIONS FORMED THROUGH SERVICE-LEARNING MATTER

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Why the Human Connections Formed through Service-Learning Matter

Abstract

As one of Kuh's high-impact educational practices, service-learning fosters deep learning and promotes both personal and practical gains. As a pedagogy, service-learning is often used as the context in another high-impact practice: capstone design. Together, the two offer students the opportunity to integrate and synthesize their knowledge in a new, and often diverse, setting. The experience has students working on real world problems for very tangible real people, with whom they interact to understand and define the scope and objectives of their design projects. A mixed method study was conducted consisting of a quantitative instrument and qualitative analysis of written reflections and focus groups transcripts. The 74-item Ableism Index includes subscales on intergroup anxiety, resistance to equalizing policies, negative internal states, contempt, phobic, and confidence. It was administered to students pre- and post- their capstone design class during which students worked on either an adapted physical activity service-learning project or an industry-sponsored project. Students responded to directed reflection prompts on design, clients, and teaming in written essays. Eighteen focus groups were conducted with student teams who worked on adapted physical activity design projects. This paper reports on the results of a thematic analysis on written reflections about service-learning clients, and presents links to the Ableism Index. Student motivation differed based on project type, and altruism increased for those working on service-learning projects that can be attributed to the relationships formed with individual clients.

Student Attitudes Toward People with Disabilities

It is increasingly recognized that physical disability is not located solely in biological impairment. Sources of disability include adverse reactions from others due to perceived difference, known as *stigma*, and social and physical environments that create a poor match between a person's abilities and the environment's attributes[4,7]. The stigmatization of people with disabilities occurs when people with disabilities are labeled as different and those differences are negatively stereotyped resulting in deleterious social and emotional outcomes[5].

As capstone design students began working evermore closely with clients for whom they building adaptations, and as these student-client interactions increased in frequency, it became clearly apparent that the stigma of disability had the potential to undermine project success. It was soon apparent that many engineering students lacked exposure to people with disabilities and that this in turn led to them treating people with disabilities differently. For example, in one particularly insensitive interaction one of the students directed questions to a client's wife instead of to the client himself.

These students were not consciously being negative toward their clients but their attitudes were borne of their exposure to social constructions of disability based on pity, rather than neutrality or being based upon compassion. This mindset has the potential to undermine the success of a project by limiting the way engineer students think about their client and his or her use of what they are designing and building. People operating from this perspective have a tendency to focus on what someone cannot do rather than what someone can do, a subtle but important difference

when the goal is to empower people into being more physically active. A practical example of this was manifest in a student who referred to clients as "patients" suggesting that they were looking at clients as people who were "ill" or "sick."

As the authors oversaw different design projects, they recognized there was an opportunity to assess the learning of the students who were completing these projects. Although many have shown the motivational effects between societal relevance and learning achievement[2,3,15,18], to date none depict how service-learning affects students' attitudes towards people with disabilities and how participating in an adapted physical activity design experience affects design learning.

In an effort to counter harmful attitudes toward clients and enrich the project experience the authors began a coordinated effort to train and partner kinesiology students with engineering design teams. The purpose of this was twofold: to deliver disability awareness and sensitivity training to the engineering project teams and to serve as co-designers with the intent of inclusion. Training included assigned readings, presentations, video case studies and handouts that summarized the content of the presentations. Kinesiology students conducted special training sessions for engineering students based on these materials and led students in discussions about issues that could arise during the course of their projects. At the completion of the training, kinesiology students were partnered with each engineering design team to provide expertise in and show how adapted physical activity theory could be specifically applied to their project.

To gauge, in part, the impact of this training and of involvement in these projects the "Ableism Index" was administered to the engineering students at the beginning and end of their projects. By measuring student attitudes toward people with disabilities one stands to learn whether attitudes change as result of involvement in these projects, and whether people with more inclusive attitudes tend to be more successful at facilitating inclusion.

The Ableism Index is an ideal instrument to use in this instance because it was designed as a multidimensional instrument to measure subtle ableism. It has the potential to go beyond indicating merely that students do or do not harbor "ableist attitudes" but also where ableism is found to hint at the source of those negative attitudes. The Ableism Index was designed to address the complexity of the stigma process which involves labeling another person as different, stereotyping that difference as negative, perceiving the person as one of "them" rather than one of "us," and consequently devaluing, rejecting, leading to a loss of status and the presence of discrimination11 (Link and Phelan, 2001). The Ableism Index has six subscales that achieved statistical significance: Intergroup Anxiety, Resistance to Equalizing Policies, Assumption of Negative Internal States, Contempt, Phobia, and Competence. Although overt ableism is less prevalent today than in times past, the Ableism Index was constructed to gauge subtle levels of discrimination against people with disabilities which, although clearly less pernicious, can profoundly impact people with disabilities and effectively prevent their full and equal inclusion in society.

The stigma process does not occur uniformly across disability categories; some disabilities are stigmatized more than others [1,13,17,19,21]. For example, Royal and Roberts[14] found that twenty different disabilities varied in perceptions of visibility, severity, acceptability, and familiarity. Saetermoe et al.[16] found that nineteen different physical disabilities created three "stigma

clusters" (mild/moderate disabilities such as blindness, severe physical/mental disabilities such as paraplegia and Down syndrome, and mental illness). Additionally, studies support the notion that people have more negative reactions to disabilities that remind them of their own physical vulnerability; fear of experiencing the same calamity leads to anxiety and then rejection of people with disabilities[6,9,12].

The Design Experience and Client Reflection

Computer and mechanical engineering undergraduate students, completing either a two-quarter or three-quarter capstone design class, work in teams to design and build devices for local community members as well as participants in the Adapted Physical Activity Program.

To help promote adapted physical activity in the local community the Adapted Physical Activity Program provides opportunities for individuals with a range of disabilities access to a variety of recreational activities. The Adapted Paddling Program has made kayaking in a local bay accessible to over 40 community participants who are diagnosed with differing levels of spinal cord injuries. Paddlers have found the freedom of an aquatic environment to be very empowering. Similar benefits have been obtained through the EyeCycle Program, where people who are blind or who have low vision ride tandem bicycles. Kinesiology students take the "captain's" position while participants sit in the "stoker" position. A third part of the Kinesiology Adapted Physical Activity Program is the Friday Club. This is a Special Olympics program that brings people with developmental disabilities to the Cal Poly campus to learn a variety of sports skills.

Some of the design projects[20] completed by engineering teams include the SoloQuad Kayak (an adapted sea kayak to be piloted by a local resident who has high level quadriplegia), the Universal Play Frame (a device that mounts onto any wheelchair onto which a variety of specially designed and built sports equipment can be attached), Universal Play Frame Equipment (such as Frisbee, Golf, and Baseball attachments that have been design for people with physical disabilities), and the Adapted Sit Ski (a cross country ski-seat combo for people with paraplegia). These projects provide the teams interesting design challenges based on the abilities of their clients and opportunities to get to know their clients personally through the design experience.

Integrated throughout the course, students respond to directed prompts on design, their client, and teaming in the form of written reflections. They are intended to engage the student into thinking critically about their design experiences. The prompt for the client reflection was provided to students as follows:

> Reflection #2: For your design project you are working towards satisfying a sponsor/client or end user with a design. Please reflect on your interactions with your sponsor/client/user. What were your assumptions about the sponsor/client/user before you met them and how have they changed through your interactions to date. Also comment on how interactions with the sponsor could be improved.

A thematic analysis of the written reflection responses uncover students' client assumptions, motivations and relationships.

Students, Their Attitudes, and Reflections

This study used a multidimensional instrument to measure subtle forms of stigma in regards to people with disabilities (subtle ableism). Statistical analysis resulted in a measure with six subscales with high internal consistency reflecting social anxiety around people with disabilities, resistance to equalizing policies, assumptions of negative internal states such as low confidence, disgust regarding "special treatment" received by people with disabilities (contempt), fear of people with disabilities, and assumptions of incompetence. Results also confirmed that the instrument may be useful in the examination of stigma hierarchies. By including an examination of subtle ableism and its correlates, this study furthers understanding of ableism as identified by people with disabilities and provides support for social models of disability. For example, public policies supporting the civil and social rights of people with disabilities are a cornerstone of the disability rights movement and this study found decreased support for such policies was positively associated with other indicators of subtle ableism.

Contrary to expectations based on a disability rights perspective of stigma, statistical analyses did not support the inclusion of perceptions of heroism in the measure of subtle ableism. This may be because for some people, perceptions of people with disabilities as heroic may stem from an acknowledgement of physical and social barriers faced by people with disabilities. Indeed, heroism was negatively correlated with resistance to equalizing policies and resentment regarding disability rights. Further, the fact that heroism and pity often experienced as stigmatizing by people with disabilities warrants further study. Heroism and pity may be "benevolent" forms of ableism akin to benevolent sexism. Likewise, benevolent forms of ableism in which people with disabilities are viewed as heroic or pitiful, may reflect perceptions of people with disabilities as "other" and "lesser" and in so doing, contribute to their inequality.

Students who worked on Adapted Physical Activity projects were given the opportunity to participate in one-hour focus groups. The purpose of the focus groups was to answer the question: What impact does completing a senior engineering capstone project in designing recreational equipment for people with disabilities have on learning design and motivation to complete such a project? Secondary to that, we were also interested in evaluating the overall impact and value of the project, the multidisciplinary nature of the interaction between engineering and kinesiology students, and as a feedback tool for program improvement.

Major findings[8] from the focus groups indicate a number of emergent themes from the data analysis of transcripts. The themes comprised five major categories: learning design, motivation to complete design, perceptions of people with disabilities, planning, and improving future projects. Additionally, and in the authors' view most importantly, there was a noted increase in altruism from students.

A thematic analysis on the written reflections about students' assumptions and interactions with their clients resulted in four major themes.

1. Assumptions
2. Impact
3. Motivation
4. Understanding client needs

In the first theme, *Assumptions*, students often expressed thoughts on what they believed to be the intent of what their clients were thinking and about their abilities. Thoughts on client assumptions included, for example, a student-centered view of their clients, "he would want us to enjoy the project." Thoughts on client abilities included an assumption of the lack of an engineering background, "We assumed she had little to no engineering background," yet also assumed some knowledge of the problem to be addressed. This knowledge was explicitly acknowledged after meeting with their client, "She seems very knowledgeable of the needs."

Students had assumptions on how easy they believed their project would be. Those that expressed an assumption of ease would indicate a dramatic shift in their beliefs about their project after meeting with their client and multiple end-users of their devices. Negative assumptions or impressions changed after meeting clients and seeing their clients and end-users as people. This is where the *Impact* theme emerges. A student working on an accessibility project for people with physical disabilities writes,

> "At the beginning of this year, I have had little exposure to the challenges these people face on an everyday basis. Due to this lack of exposure, I was much more apathetic to their situation thinking that our stool would have little to no impact on the users everyday lives. This perception greatly changed even after one visit to VTC. It has opened my eyes and made me realize that this is a very needed product and our efforts now could change these peoples lives, making something as simple as getting into a car no longer be a challenge."

Similar to the deeply meaningful phrases from which the impact theme emerged, the *Motivation* theme was eloquently expressed in students' written reflections. This ranged from initial motivations to choose to work on a particular project, "Going into the project I have not had much interaction with people with disabilities so something I wanted to take out this project was more awareness for people with disabilities," to ways in which students were motivated to successfully complete their project after getting to know their client as a person, "…after we have gotten to know John as a person and not just as a client. He is funny and has a really good personality. This makes me want to make a great device for him that he is going to love and really appreciate."

In the final theme of *Understanding Client Needs*, students noted the importance of their client's voice in the design process, "so our project is heavily dependent on the users' opinions and desires of what they envision the final product to be like," and "we learned that comfort and ease of transferring to and moving around in the device were going to be the most important." Students acknowledge the importance of their clients' needs and were incorporating them into their designs.

As students' understanding of their clients grew, often by getting to know them better as people, their thinking, as expressed in their written reflections, often shifted to what the authors view as more open and inclusive to people with disabilities. This sometimes took an advocacy tone, and aligns with student responses from the Ableism Index.

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