

WIP: DESIGN STUDIO AND COMMUNITY EMPOWERMENT

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PAPER ABSTRACT: Interdisciplinary teaching has been a common practice in Industrial Design (ID) programs, and many of the projects that are being applied in ID studios or courses are sponsored by or in collaboration with external entities. In addition, user-centered design has made stakeholder engagement an undivided part of the design process. Therefore, many of the interdisciplinary projects that are in collaboration with non-design stakeholders require engagement with communities involved in the project. In this study, we are investigating the relationships among the interdisciplinary project-based courses, the related communities, and student learning outcomes. Also, we are looking into challenges that the faculty (especially ID faculty and programs) face in designing, creating, conducting, managing, and maintaining such projects in relation to the collaborative efforts with the community. This study is a Work in Progress (WIP) to investigate the impact of project-based learning and interdisciplinary teaching on community stakeholders, collecting data through interviews, focus groups with course founders-designers, community partners, industry collaborators, students, and community members to gain insights; and includes some data collected through qualitative and quantitative methods, including surveys, interviews.

Keywords Design Studio, Interdisciplinarity, Service Learning, Project-Based Learning, Community Engagement.

1. INTRODUCTION

Design studios are one of the main principles in design education (Green & Bonollo, 2003). The studio space gives students the opportunity to apply the knowledge and theories they acquire from lectures, to practical projects defined within each studio (Kumar, Paula, & Renugha, 2021). Industrial design majors are centered around project-based learning (PBL) principles, where design graduates are expected to demonstrate proficiency in both hard skills such as ideation and fabrication, as well as soft skills such as critical thinking and cultural understanding (Freitas & Almendra, 2022). While many design programs traditionally adhere to hands-on and Bauhaus pedagogy in their curricula, these skills, although valuable in fostering creativity and teaching the process of making, are no longer deemed sufficient in contemporary design education (Droste, 2002) (Yu, 2009). Project-based learning within design studios provides students with the opportunity to apply and integrate their skills in addressing industry demands and specific project challenges. The design process has evolved into a complex endeavor,

encompassing aspects such as problem-solving, user interaction, user experience, and design thinking; all of which require designers to utilize their multifaceted skill sets systematically and critically to provide effective design solutions.

Although project-based learning has been widely adopted in industrial design, its popularity has expanded to other disciplines such as engineering (Sharma, Dutt, Sai, & Naik, 2020) and business (Danford, 2006) making PBL an ideal approach for interdisciplinary education and skill development (Sharma, Dutt, Sai, & Naik, 2020) (Boss & Krauss, 2022). In this study, focus is on PBL and interdisciplinary teaching as a means of engaging with the community and investigating the impact of this collaboration especially on the community. This study aims to understand the experiences and outcomes of community-engaged design studio projects, provide insights for educators to improve teaching methods and promote meaningful change within the community and various stakeholders through mix methods data collection. The methods include interviews, focus groups with course founders (teachers), community partners, industry collaborators, students, and community members. This is an ongoing study, and we are in the process of collecting a variety of data to gain insights into the effects of these projects.

2. INTERDISCIPLINARITY IN EDUCATION

Ongoing and future global issues and challenges are complex and require strategies that transcend disciplinary boundaries (Ashby & Exter, 2019). ID graduates must possess social connectedness and collaborative skills to work effectively in teams across traditional disciplinary boundaries (Van den Beemt, 2020). Interdisciplinarity has emerged as a popular approach for fostering innovation, (Edmondson, 2018) particularly in project-based learning courses focused on real-world issues that allows students from diverse disciplines to offer unique perspectives on solving common problems (Kuo H. T., 2019). To facilitate this approach, it is crucial to provide students with access to professionals and stakeholders from various fields, as well as interdisciplinary mentoring and activities (Moirano, 2020). True engagement and integration of disciplinary knowledge in the co-creation and collaborative development of solutions to complex problems are central to the definition of interdisciplinarity in design education (Repko, 2020) (Ashby & Exter, 2019). Evidence suggests that interdisciplinary education can enhance students' learning outcomes and foster improvement, competitiveness, and advancements in scientific and technical knowledge, innovation, and the economy (Kuo H. C., 2019). In the following sub-section, we explore various teaching strategies that employ creative and problem-solving approaches, highlighting their applications and their relationship with the design studios.

2.1 SERVICE LEARNING (SL), AND DESIGN STUDIO PROJECT SIMILARITIES

Project-based learning, service learning (SL), and design studio projects exhibit several similarities (Moirano, 2020) (Repko, 2020) and incorporating interdisciplinarity can be a crucial element in addressing real-world and global challenges.

When designing solutions for global issues, socio-cultural considerations play a crucial role in decision-making (Frascara, 2017). First coined in 1967 (Sigmon, 1979) service learning (SL) has emerged as a prominent teaching strategy in social science higher education, equipping students with the ability to comprehend community needs and interactions (Resch, 2021). This approach emphasizes the development of solutions that are not only functional but also socially and culturally relevant, positively impacting both the world and the communities they serve. While primarily utilized in sociology and public health, SL provides a bridge between theory in the classroom and real-world practice. This fosters a heightened sense of civic engagement (Bringle, 2006) while creating “an enhanced sense of civic engagement” (Resch, 2021). SL principles focus on understanding the service (identifying needs or problems in the design process), those being served (users/communities), solution sustainability (integrating the notion of sustainability in the design process), and active engagement from all the stakeholders (conducting user and stakeholder research in the design process) to create the most appropriate service or solution (Sigmon, 1979). Despite engineering and design having relatively low adoption of SL principles in academia (Salam, 2019) there is a growing interest in this approach within design education, problem-solving, and project-based learning studios (Tijmsma, 2020).

Considering the similarity between the SL and design studio/process, research (especially user research) is a vital part of design studio. Community-based participatory research is a collaborative approach where researchers partner with community members throughout the research process. It aims to address community concerns, promote social change, and incorporate community expertise and perspectives into research design and outcomes (Gimpel, 2018). Service learning and community-based participatory research (CBPR) share a strong relationship based on their mutual emphasis on community engagement, collaboration. Both approaches recognize the importance of active involvement and meaningful interaction with community members which translates to stakeholders in design process and design research. Service learning can serve as a practical application of CBPR principles, allowing students to engage directly with communities and contribute to their well-being, while CBPR can inform and enhance service-learning initiatives. Together, service learning and CBPR foster reciprocal relationships, empower communities, and promote socially responsible actions (Marcus, 2011).

We briefly mentioned some similarities between service learning (SL) and the design studio/design process. Design studios, known for their project-based learning style (Kumar, Paula, & Renugha, 2021) are well-suited for addressing complex global and socio-economic issues that impact communities worldwide, especially when incorporating interdisciplinary perspectives, critical thinking, and problem-based learning tools. Educators can enhance students' understanding of the socio-economic and cultural contexts in which their designs will exist by incorporating case studies and real-world projects. By connecting the classroom with the broader community, students can develop a deeper awareness of the societal impact of their designs. In the design process, considering that the principles of SL can help designers prioritize the interests of the broader community while developing solutions for the users, emphasizes the importance of designing for the user's needs.

Some similarities between service learning (SL), (including the community-based participatory research as a part of SL) and the design studio, particularly in an interdisciplinary context, include a) providing students with hands-on experience in real-world settings, b) fostering collaboration and teamwork in an explorative and creative process, and c) promoting social responsibility and civic engagement. Both approaches encourage students to actively consider the broader impact of their work on the community and strive towards achieving positive social change.

3. COMMUNITY ENGAGEMENT AND INDUSTRIAL DESIGN

3.1 SERVICE LEARNING (SL), AND DESIGN

Incorporating effective community engagement in design studio projects can enhance the learning experience and increase the studio's impact. By actively involving the community, students gain a deeper understanding of real-world challenges and develop solutions that address social, environmental, and economic issues. This approach also cultivates empathy, cultural competence, and a sense of responsibility towards the community, transforming the industrial design studio into a platform for creating meaningful change. However, it is essential to assess the impact on the community and evaluate the outcomes for non-academic stakeholders such as experts, community representatives, and members. Exploring their experiences in relation to students, faculty, and themselves can guide educators in improving their teaching methods and viewing the studio as a collaborative design process for the community.

3.2 DATA COLLECTION APPROACH AND INTERVIEWEES INSIGHTS

Many PBL studios involve a significant level of community contribution, leading to inevitable two-directional impacts resulting from interactions among stakeholders, including professionals, community members, professors, and students.

In the initial stage of this work-in-progress study, a mixed-method (qualitative and quantitative) approach was used for data collection. Each participant completed a survey that included questions about the intended PBL project, such as the type of project, duration, final outcomes for students and stakeholders, and other basic information. The participant population consisted of a diverse representation of faculty, professionals, and community representatives. While the survey results provided valuable insights for the researcher, one-on-one follow-up interviews were conducted to gain a deeper understanding of the participants' perspectives. Although this research is ongoing, all participants expressed the short and long-term impacts of these projects on all parties involved.

During the interview, Ben Kirkland, a third-year studio professor at Virginia Tech discussed the educational influence that projects with a high level of community engagement have on the curriculum, introducing new methodologies in the studio. For instance, a project in the industrial design program at

Virginia Tech focused on Aging in Place, initially targeting residents of an assisted living community. However, the prolonged collaboration between the Industrial Design program and this community facilitated connections with the caregivers, which is another critical community involved in the subject matter at hand. Additionally, Professor Kirkland highlighted the enthusiasm exhibited by community members and the stakeholders in sharing their experiential knowledge. Ben said, *“The community is prepared and eager to talk to the students.”*



Figure 1. Students interviewing an assisted living community member, junior design studio thought by Ben Kirkland, Adjunct Instructor at Virginia Tech, Photo credit: Martha Sullivan, Chair of industrial design, and Associate Professor

Additionally, Associate Professor Martha Sullivan, Chair of the Industrial Design program at Virginia Tech as the main instructor for the coffee bike project, elaborated on how the initial design project and collaboration with young adults/students and their ideas energized the Virginia Tech Recovery Community. This enthusiasm sparked the proliferation of coffee bikes throughout Virginia, creating more instances of this innovative concept.

“Most people that I work with are really energized by the students. They often come up with new ideas or they help the community members look at something from a new perspective or most importantly, from a new generational perspective.”
Said Martha Sullivan, Chair of industrial design, and Associate Professor.



Figure 2. Left and middle: Students Making and testing the final product. Photo credit: Martha Sullivan, Chair of industrial design, and Associate Professor Right: The Virginia Tech Recovery Community's coffee bike final product in use. (Virginia Tech News, 2021)

On the other hand, the interviewed professional stakeholders in studio project with high level of community engagement – around 60-80% overall- (which are vital entities in a successful interdisciplinary project) emphasized on the correlation between effective communication, coordination, and project/design project success. Also, their continuous connection with the community enabled them to corroborate on further changes in community communications and behavior after such a project.

“In my experience sometimes by starting a new conversation you can show the community that there’s a way to talk. There is a way to demand. You might even move on from one project to another project. But that one project can instigate flame, or a spark in a community that gives them the power of the voice and power of wanting to change for their people, for the people around them and themselves.”: Said Kevin Deck, Senior design Architect and Principal at SFCS.

4. DISCUSSION AND FUTURE STEP

This study investigates the relationship between interdisciplinary project-based courses and student learning outcomes in industrial design, as well as their impact on related communities. The study is based on project-based learning (PBL) principles and interdisciplinary education, emphasizing the importance of engaging with communities. Currently, the knowledge gained by surveying and interviewing has helped the investigators to revise the survey’s questions with more focus towards the community and their outcomes. Also, investigators aim to use participatory design (faculty, community, and students) while exploring the challenges faced by the faculty in designing, conducting, managing such projects and evaluating their short-term and long-term impacts. The intent of using participatory design is to create an assessment framework for industrial design PBL projects with community engagement as a core. The results of this study would provide useful recommendations for institutions and the faculty to create more effective interdisciplinary project-based courses that empower communities and students.

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