

# Building Bridges: A Holistic Approach to Web Development Education Through Community Engaged Learning and Social Justice Initiatives

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**Abstract**— This innovative practice full paper describes an innovative pedagogical framework that integrates community engaged learning and social justice principles into a traditional web development course, fostering a holistic approach to education that goes beyond programming languages and algorithms, and aiming to redefine the educational landscape by encouraging socially responsible and community-driven web development practices. The community engaged learning component of the course is structured around partnerships with local non-profit organizations, community groups, or socially impactful initiatives. Through these partnerships, students engaged in real-world projects, applying their technical expertise to develop impactful solutions that contribute to social justice causes. The web development course framework is presented and sample projects are provided with student and community partner reflections and benefits. We explored the effect of the community engaged learning and social justice initiatives on technical proficiency, critical thinking, teamwork, and ethical reasoning. Results indicate a positive correlation between community engaged learning experiences and increased student motivation, teamwork, and a heightened awareness of the societal implications of their work. Furthermore, the paper discusses the challenges encountered during the implementation process and proposes strategies for overcoming potential barriers. The findings of this research contribute to the ongoing discourse on the evolution of computer science and engineering education, advocating for a holistic approach that not only equips students with technical skills but also instills a sense of social responsibility.

**Keywords**—*computer science education, community engaged learning, social justice*

## I. INTRODUCTION

In-class programming assignments are no longer the type of college student's solitary work. Instead, collaboration and initiatives centered on social justice projects encourage students to volunteer their technical skills on a common goal, to design and build websites around local civic issues. Through reflection, action and service, students are not only taught the technical skills to prepare them to become software developers but also challenged to see how they can use their privileges to help those who are oppressed. In this paper, the community engaged learning and social justice-based learning approach for a computer science and engineering course is explained and students' perceptions explored. The paper proves that community engaged learning through social justice is not only

successful in teaching students' web development skills in the real-world environment, but also furthers their understanding of the social justice issues, thus increasing their personal awareness and knowledge, and preparing them better for social action.

To fully understand engineering concepts and to apply material learnt in the classroom, hands-on projects were proven to enhance the course outcomes based on the authors' prior research work [9-16]. Students need practical experiences in their courses and communities: to identify real problems and work with partners toward solving them, while helping others. While more and more universities are starting to think about the benefits of these styles of learning, Fairfield University's Computer Science and Engineering department has already embraced the university's mission of developing the whole person that includes community engaged and social justice learning.

Community engaged learning is applied learning where students apply the theories learnt in the classroom to a project for a non-profit organization and engage in reflective activities. This form of learning combines course objectives with community service in order to provide a pragmatic, progressive learning experience while meeting both educational and societal needs. The importance of community engaged learning can be understood in many ways and was studied specifically for a required undergraduate Web Development course. With a redesigned Web Development course with a Social Justice signature element designation, we offered the students a chance to not only collaborate with a local non-profit organization, working with a real mentor, but also helped them understand the social justice and service aspects of the project, which are critical aspects of Fairfield's Magis Core education.

This paper presents a brief exploration of theoretical benefits of service and social justice-based learnings, preliminary data, and sample projects to show the success of the educational approach. The framework of the web development course is described, which involves social responsibility and community-based projects. This paper contributes to the evolving discourse on web development education by advocating for a comprehensive approach that nurtures socially responsible developers. By bridging the gap between technical proficiency and a commitment to social justice, our framework aims to cultivate a new generation of web developers who view their software craft as a powerful tool for positive societal impact.

The paper also presents surveys data taken from two cohorts of the Web Development course, and course outcomes, including student experiences and reflections, are discussed.

## II. COMMUNITY ENGAGED LEARNING AND SOCIAL JUSTICE

To understand the success of community engaged learning, it is important to explore its importance in a college education, especially a Jesuit education. This section aims to understand the importance of community engaged learning as well as social justice pedagogy, and its benefits along with the Jesuit mission and how community engaged learning aids in fulfilling that mission in engineering courses such as Web Development.

Software web development is a course that almost every computer science department offers. Compared to a traditional learning method, community engaged learning and social justice learning not only help provide a context for the problem they are trying to solve, but also keep students engaged so they learn the skills better, and make them responsible democratic participants in the society. Service based learning questions the traditionally held notion that knowledge is first discovered and then applied [6]. Community engaged learning is a pedagogical approach that engages youth in achieving learning goals that link communities and schools through intentional, structured activities [7]. Many scholars now understand that community engaged learning offers many benefits. Students engaged in community get exposed to learning options and have greater opportunity to experience and acquire new skills, as well as apply the ones they already learnt in the classroom. By the same token, the greater prevalence of structured reflection in community engaged learning makes students more likely to apply critical thinking, synthesize information from classroom and community settings, and examine structural/institutional antecedents of social issues [1].

However, too often, community engaged learning projects focus on providing a one-time service without questioning why the need for such service has arisen in the first place. This can be understood by a few examples of what students in the Web Development course have done in the past. For instance, when engineering students design and implement websites for a family resource center in a poor neighborhood, they are also addressing systemic injustices (such as the prevalence of resources in rich neighborhoods and the relative lack of integrated family support and child development services in the poor ones); when engineering students design and implement websites for a provider of pharmaceuticals to low income and uninsured patients, they are exposed to systemic inequities that create an environment in which charity is necessary and can start a conversation on a different conceptual approach for a social justice framework to care for the underserved; when engineering students design and implement websites for an initiative that gives women around the world opportunities to earn a sustainable living, contribute to their families and communities, and be part of a global network of positive change, they raise awareness on these initiatives, are inspired to do volunteerism and can become positive influencers in society. Therefore, it is important that service-based learning be combined with social justice learning.

With community engaged learning through social justice, students are encouraged to analyze a social problem as they can

discuss the situation, observe behavior, and take notes, seek out experts and service providers in the community related to the issue [5]. Although students do not have a real job yet, they are able to work with real mentors in a real-world environment. The students also get an opportunity to get involved in efforts to change the root causes of a problem, rather than just respond to the immediate needs at hand [2]. This reinforces the idea that even if students are not successful in bringing about the changes they are advocating, they can learn about critical inquiry, social research, how social systems work, and the effort and perseverance needed to affect lasting social change. Community engaged learning is not an additional assignment and rather an experience that allows students to see academic concepts in action and directly apply the theory learned in the class in nonacademic environment [3] [4]. Spreading awareness about the social injustices that the organizations they partner with face, is an added benefit.

By comparison, while some other Jesuit institutions, such as Boston College and Loyola Marymount realize the need of hands-on learning, they either approach Web Development in a more traditional way or place emphasis on the business use, such as web integration with business strategy and activities. While this approach tackles the hands-on learning necessary for computer science and engineering, it still lacks the involvement of civic engagement or social justice learning aspect. The service and social justice-based learning help students get involved with their community, learn about the social injustices in the society and provide service while gaining the real-world experience, helping non-profit organizations, which can rarely afford these web design and development services.

The importance of community engaged learning through social justice can also be understood through the Jesuit education lens too. Fairfield University, through its Mission Statement, is Catholic in both tradition and spirit. The component of community engaged and social justice learning fulfils the mission of Cura Personalis, (“care of the whole person”) as students grow outside of the academics and learn different skills that they can apply to their personal and professional growth, which helps them grow as a whole person. It also fulfils both magis and reflection values. Magis (“more”), is a hallmark of Jesuit education, as it challenges students to go beyond what is expected of them. The service and social justice learning not only gives students opportunity to go beyond their textbooks to build hand-on projects for their non-profit organization partners, but it also helps them help others while they do so. The practice of reflection is a value where the students are invited to pause to consider the world around them, challenging the status quo and accepting responsibility for actions. The community engaged learning and social justice course helps students reflect on the condition of the society and create an action-oriented plan to work on improving the society.

Therefore, these Jesuit values are furthered by community engaged learning as all students registered for the course are required to work on a group project in collaboration with a community partner. Furthermore, in software engineering, all these skills develop better when students have a real-world project to apply their skills on, enhancing the academic learning and preparing students for what is to come beyond their education.

### III. WEB DEVELOPMENT COURSE FRAMEWORK

The Web Development course focuses on developing applications for use on the World Wide Web. As it is common in a traditional approach to Web development, the students learn basic n-tier concepts for designing distributed applications. This includes designing and authoring Web pages, markup languages, the client-side document object model, usability, search engine optimization, and client-side dynamic Web pages. Recognizing the increasing influence of technology on society, our innovative teaching approach for this course seeks to cultivate a new generation of web developers equipped not only with technical skills but also a profound understanding of their ethical responsibilities and positive change potential in their communities.

Similar to a traditional approach, the course assigns homework, lab assignments and two exams to test the knowledge and to help students apply their knowledge from the lectures. Unlike the traditional approach, all students registered for the course are required to work on a group project in collaboration with a community organization that provides a wide range of support to various populations who face oppression or social injustice. Students work collaboratively to identify real-world problems and design web-based solutions that address specific needs within these communities. This hands-on experience not only provides practical application of web development skills but also exposes students to the complexities of real-world challenges, emphasizing the importance of social justice awareness, civic responsibility, and cultural sensitivity in their work.

A community engaged learning project often generates genuine interest among the students because it addresses a real-world problem. Inherently, it also exposes students not only to technical knowledge but also to humanitarian opportunities, public services, affordability issues, community inequity, etc. Each team of students forms a partnership with a community organization to develop a real web application for their particular needs. The students are involved in the full web development lifecycle, from gathering project requirements, design, implementation, testing, to deployment. Through teamwork, students learn to apply separation of concerns and divide up a large problem into sub-problems that could be solved individually, assign and schedule tasks, and then integrate the pieces together into a working solution. This approach is heavily used in computer science and helps students get ready for their professional careers.

The Web Development course also focuses on developing the student's analytical thinking as the students will be facing real-world projects that might span over multiple disciplines with less well-defined problem statements, and strict deadlines. Students have to keep a project journal over the entire course to reflect on their entire journey of building the website. The journals also include personal and team notes indicating their progress, as well as reflections, keeping the students accountable and preparing them for the professional world, for writing documentation. Additionally, weekly team meeting logs are required that provide project status, issues experienced, weekly accomplishments, individual assessments, schedule for the following week(s), so that it would allow students constantly

and purposefully to reflect on their learning and relate it to their work for the organization. At the end of semester, the students have a customer-oriented presentation and discussions on application deployment.

Without the service/social justice learning component in this course, the course outcomes would be limited to the technical abilities. By bridging the gap between technical proficiency and a commitment to social justice, our framework aims to cultivate a new generation of web developers who view their technical craft as a powerful tool for positive societal impact. Through this holistic educational model, we envision a future where web development includes ethical innovation and positive changes in communities worldwide, through the great potential of being replicated in other universities.

The bulk of research on community engaged learning has focused on student outcomes; however, there is a scarcity of research examining the lived experiences of community partners. One study supports the contribution of community engaged learning to communities, the importance of investing in reciprocal relationships, and the value added of including community partners who are members of informal networks and civically active residents [8]. In our case, the community partners are all local based non-profit organizations that meet the criteria for academic service and social justice learning, as civic objectives involving diversity, leadership, inter- and intra-personal, and social responsibility learning are fulfilled. In working for communities' website presence, the students collaborate with many different people, are involved in collecting information about people and facts that will be presented on the website, learn more about the communities they serve, practice interpersonal skills for management and team membership as well as being exposed to the social, ethical, cultural, and safety issues in application deployment. The community partners also act like mentors and guide students by providing them feedback and ways to improve. Leading the experience as community partners, they feel a positive influence and growth as mentors, while benefiting from brainstorming sessions with the students and from their final website results. Therefore, the structure of the course is designed to be a win-win situation for the students as well as the community partners.

### IV. COMMUNITY ENGAGED PROJECTS

In the Web Development course framework, project-based learning allowed students to serve specific groups of people in our society, while at the same time enriching students' learning, retention and commitment by enhancing their interest, motivation and ability to see the relevance of classroom activities to solving real world problems. Our framework proved capable to make visible the intertwined social and technical dimensions of computer science and engineering. This allowed for deep, authentic learning of important themes such as social justice and social responsibility, which otherwise may not find place in the computer science and engineering curriculum.

Students partnered with a variety of non-profit organizations and helped design and develop web applications under their mentorship. They were allowed to self-select themselves to groups or ask the instructor to do that for them. A community engaged learning associate student (upperclassman undergraduate student who took the course in prior years) is

assigned to work with the instructor and serve as a liaison between the students and the organizations, for a more seamless experience.

Some of the projects that students worked on, the community partners, and their programs were as follows:

- Literacy Volunteers who actively promote literacy by identifying adult literacy needs in the community and meeting those needs through direct literacy services, helping illiterate adults acquire the literacy skills necessary to be successful in the workplace, participate in the education of their children, and lead productive lives (Fig. 1)

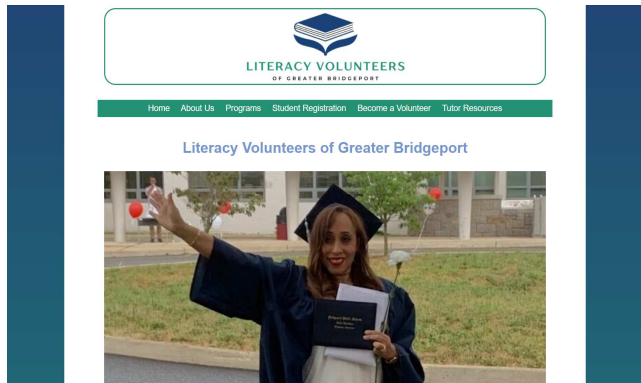


Fig. 1. Literacy Volunteers Website

- Career Resources who improve the employment situation of state residents in order to mitigate the causes and effects of poverty, and offer training that provides youth and adults with the skill sets, personal development, and learning opportunities needed to reach economic self-sufficiency
- The Peace Corps Community for Refugees who is devoted to the support of refugees and immigrants in the United States and around the world and strives to engage in service opportunities, legislative advocacy, public awareness, and refugee welfare and support
- Greater Bridgeport Area Prevention Program who provides services for adolescent sexuality-related issues, which include prevention of adolescent pregnancy and sexually transmitted infections including HIV, and provides shelter and social services to at-risk youth
- Dispensary of Hope who is a provider of pharmaceuticals to uninsured patients through a growing network of dispensing sites across the country sustained by local partnerships, dedicated to providing short-term and long-term medication assistance to eligible patients
- Unite the World with Africa Foundation who serve and uplift the lives of impoverished, marginalized youth and women across East Africa, and more specifically the Unite Food program which is a social enterprise operated by Tanzanian women whose mission is to empower poor small-scale farmers with a secure market for their crops and fair market prices as well as to provide healthy and

affordable staple food options to all Tanzanian people (Fig. 2)



Fig. 2. Unite Food Program Website

- Regional Youth Adult Social Action Partnership who tackles the tough issues teens, their families, and their communities face such as community violence prevention, gambling/substance use education, juvenile justice reform, mediation, personal safety, suicide prevention, teen relationships, urban education reform, and youth leadership (Fig. 3)

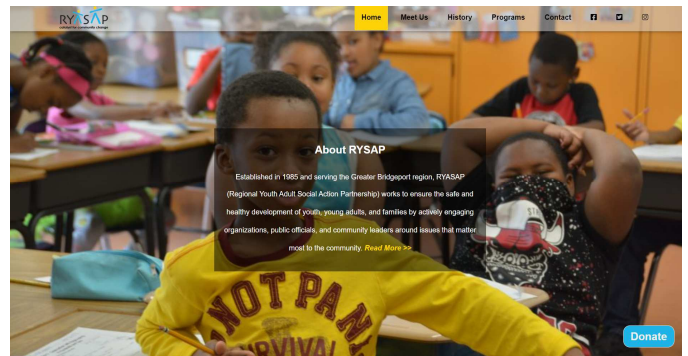


Fig. 3. RYASAP Website

- Storehouse Project who provides individuals throughout the state with food and other basic human needs (Fig. 4)



Fig. 4. Storehouse Project Website

Through several milestones, the students gathered and analyzed requirements, identified constraints, designed and developed a fully functional website, while at the same time learned about these organizations, their services, people they served, and critical social issues. The students were asked to reflect upon their service experiences throughout the semester in

various ways, and interpersonal communication, self-awareness, and sense of civic responsibility in addition to problem solving skills and deeper understanding of technical subject matter were promoted. Besides the weekly team logs for the projects, two individual reflections and two group discussions were administered at various intervals, at the beginning of the semester, at mid-semester point, and towards the end. The questions were broad in nature regarding community needs, their service contribution, the effect of this experience on their beliefs, career, and willingness to help other, exposed social justice inequities, lesson learned, etc. The assignments integrated technical aspects with the social justice aspects to make students better understand their engineering responsibilities to humanity. Through the project work and discussion/reflection assignments, students examined own identities and saw how different identities can lead to different perspectives, experiences, values, worldviews, and access to power and privilege. Through discussion, students got to see how people are systematically advantaged or disadvantaged based on group membership.

The first project milestone was to determine the purpose of the site, establish the functional and nonfunctional requirements, website's objectives, what type of content might be included, and the target audience. In the process, the students needed to conduct research on other similar websites and meet the project partners several times to gather information about their organization. Communication with the instructor and the project partners was key in capturing the organization's needs properly.

The second milestone allowed the students to properly organize the site layout, and further develop the specifics of the website flowchart. All groups came up with wireframes for their web pages and discussed them with the project partners. From this point, some groups determined that peer-programming would be a fast and effective development methodology, and some created a GitHub repository to organize the directories to reflect the structure and delegated sub-tasks to individuals.

The third milestone involved developing the website. The students started incrementally, and kept adding new pages, while keeping the overall structure as defined in the prior milestone. Some challenges were encountered by some groups, either because of lack of experience with GitHub, miscommunication, or waiting for too long to contact their project partners when questions were raised.

Feedback from the project partners and instructor was given throughout the semester and was used to improve the design, content, and further refine or include additional requirements. This type of back and forth between the students and the mentor helped them learn the true essence of the real-world environment collaboration and feedback on the work to grow professionally. This proved to be an important learning lesson that showed up in the surveys and something students will take away in their future job experiences.

For the final development milestone, the groups incorporated all the content provided by the project partners. The students learned how to communicate professionally within a group, as well as to a client. The students mentioned that this process helped them with improvements in overall workflow and collaboration. Also having a community engaged learning

associate supporting them during the course proved beneficial to unlock some instances where more support was required either from the project partners or the instructor in a timely manner.

The evaluation phase consisted of the validation process of their website with online tools such as code linters, validators, and formatters, and keeping a consistent code style, followed by a final presentation to the project partners. In their weekly reflections, some students mentioned that if given more time, they would have loved to conduct usability surveys and see if there may have been any specific requests about additional features on the website. Some groups liked that they got the opportunity to not only work with the organizations, but also learn about their services, social issues, visit the community, and engaging with their audience. For the community partners too, this methodology proved to be beneficial as they can use technical services free of charge, which would be very costly otherwise and they would be unable to afford it.

## V. MEASURE OF SUCCESS

It is important to quantify how community engaged and social justice learning for this Web Development course affect students. The methods of analysis for the study include a post class survey administered by the instructor as well as a post class survey administered by the university's Center for Social Impact. Both surveys were taken by students who enrolled in the Web Development course at the end of the semester.

The instructor survey was administered to students participating in the Web Development course service-based projects, with 33 students responding to the survey. The students were primarily undergraduate computer science and engineering majors. The questions were formulated by the instructor to examine the success of the teaching approach. The survey was given to the students on the last day of their class, when their work was turned in for their projects and they had a good understanding of the course. The questions asked by the survey were as follows:

1. Did interactions student-to-student, student-to-teacher, student-to-project partner(s) support your learning process for the web development course?
2. I believe overall I mastered the course learning objectives better because of the exposure to community engaged learning/social justice project components compared to traditional programming courses.
3. I believe I was more motivated to do well in the class due to the real-world project experiences offered by the instructor and interaction with the project partners.
4. I believe I improved my soft skills (i.e., communication, time management, writing, etc.) as a result of interaction with the project partner(s) and the milestone activities required for the project.
5. Did the project partner(s) make reasonable efforts to respond to your questions and concerns in a timely manner?
6. How do you consider the time spent with the project partner(s)? (too little, about right, too much)
7. The best part about project-based learning is...



The last question was an open-ended question, while the rest are on a scale rating response system. The scale used for response is Likert scale (1-5, where 1 is strongly disagree and 5 is strongly agree). While the first four questions of the survey aimed to assess the success rate of community engaged and social justice learning against traditional teaching approach, the fifth and sixth question aimed to get feedback about the community partners so that their involvement can be judged as well so that they remain consistent in their communication. The open-ended question gave students an opportunity to share what their journey was like and determine what worked best for them in the course framework.

Fairfield University Center for Social Impact also conducts a Community-Engaged Learning Course Evaluation for all community-engaged courses and provided the results collected since 2018 to the instructor. The results are on a rating scale as follows: Strongly Disagree, Disagree, Agree, and Strongly Agree. There were 75 respondents for the Web Development course and the evaluation is overwhelmingly showing positive outcomes and comments.

## VI. RESULTS

The survey responses were significant in proving that the community engaged and social justice-based learning was successful in the Web Development course. The survey results were quantified and for the first four questions, the numbers are shown in Table I and represent the percent of students who agreed, disagreed, or were neutral.

TABLE I. RESULTS OF SURVEY

Question	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neutral</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
Interaction	57.58	24.24	3.03	3.03	12.12
Learning Benefits	45.45	27.27	18.18	3.03	6.06
Motivation	51.52	27.27	9.09	3.03	9.09
Soft Skills	39.39	33.33	18.18	3.03	6.06

Table I helps us understand that the interactions among students and between partner and students were helpful for 81.82% students (corresponding to agree and strongly agree). This explains that the students learn a lot about the real-world environment, while communication and interactions among team members are most important as they help determine the progress of the project. About 72.73% students agree that community engaged learning and social justice component helped them better understand the course materials compared to traditional programming courses. Therefore, the positive indication (by three-fourth of the class population) states that our approach is definitely better than the traditional programming courses. The reasons for the success of this approach can be explored further in Fig. 5.

The community engaged learning component also increased the motivation of students to do well in the class due to the real-world project experiences offered by the instructor and interaction with the project partners. This can be said because almost 78.79% students agree that the community engaged

learning and social justice component gave them motivation to do better than they would have in a traditional learning format. This shows that working with a non-profit organization not only gave them a purpose but also a motivation to complete their project on time, which resulted in increased productivity. 72.73% students also felt that they were able to improve their soft skills including communication, time management, writing, presentation skills, etc. as a result of interaction with the project partner(s) and of the milestone activities required for the project. This means that the community engaged and social justice learning aspects not only improve their real-world knowledge academically, but it also increases their soft skills necessary for every job after graduation.

The best part about project-based learning, according to the students is also depicted in Fig. 5. To quantify this, the data from question 7 of the survey was divided into four common themes – the ability to apply knowledge in real life, being able to give back to the community by working with a non-profit organization, and seeing their growth through the journey. Some students' responses had a few overlapping themes so both the themes were considered in a few instances.

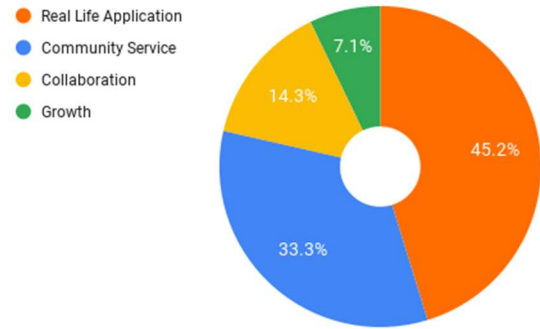


Fig. 5. Percent of students per theme.

As it can be seen in Fig 5, the top reasons for the success of our teaching approach are the real-life application and community service. Students stated in the real-life application theme that the ability to apply knowledge, deepen their understanding of the topic through hands on exercises, getting to work for a real organization, practice their skills by helping an outside organization, real experience of working with a mentor and a team, fulfilling a real goal in the world were all important. For the community service theme, students said that making an impact, helping a meaningful cause, giving back to the community, helping people from diverse backgrounds, are all important to them. These factors indicate that 78.56% students think that the reason for success of this teaching approach is the real-world hands-on application and the fact that they are able to give back to their community.

The collaboration theme included working in teams and collaborating with a community partner. The growth theme included being able to see their growth and being able to gradually add more content to the project as they moved forward with the course. These themes combined state that 21.40% students are influenced most by the growth and the collaboration aspects of the community engaged learning project.

One of the students from the course commented “The best part of service- based learning was the ability to apply course material in a meaningful way. I was able to practice my skills with the course material while helping an outside organization. Furthermore, project-based learning made me more willing to volunteer my efforts (in some form) in the future.” This shows that community engaged learning projects help students go above and beyond and also help them grow as an individual where they are more willing to volunteer and therefore, help make a positive impact in the society. This stands every aspect of the Jesuit values of Fairfield University which include going above and beyond and helping others, as “men and women for other”.

Another student said, “What I really like about service and social justice learning projects is that you get to involve yourself with a real-life project and aiming to fulfill a goal and need which is very necessary in today's modern world.” This also shows that the students realize the need for working on community service projects more than traditional projects as they are not only able to involve themselves in the real world but are able to solve problems for social things that need their attention.

Different students also mentioned that they have learned about their surrounding communities in Connecticut and would also make the efforts to educate the students within their community about it. Some students also reported feeling more inclined to concentrate on Web Development in the future as a career within Computer Science due to the positive experiences they had in the course. Almost all students felt that they had learned extremely valuable lessons and had faced unexpected challenges through these community engaged learning projects that have helped them grow.

Additionally, Fairfield University Center for Social Impact survey questions and the percent of students who agree or strongly agree with them are shown in Table II. Some qualitative comments that students provided are as follows:

- “The service learning project undertaken alongside the course made the course material seem more valuable. I sometimes felt motivated to learn certain topics so that I could integrate them into my project for the benefit of the outside organization that I was assigned to. The project enhanced the course material.”
- “I thought it was a really fun and interesting experience to participate in this classes main project. Working with a non profit organization was really eye-opening and I enjoyed being able to help community members.”
- “The service learning project undertaken this semester made me realize that certain groups and communities were not offered much assistance by government groups and had to rely on their own resources. That's part of the reason why I felt so motivated to help the organization that I was assigned to; I wanted to offer my skills to benefit an organization that otherwise may not have received the help it needed.”
- “Working with partners outside of Fairfield allowed me to grow as a person and a student. I learned how to

communicate with other people and collaborate to work on something.”

- “I hope that my work can be used to help the organization that I was assigned to this semester. I also feel extremely motivated to help my community in some form in the future.”

TABLE II. SUMMARY OF COMMUNITY-ENGAGED LEARNING COURSE EVALUATION FOR THE WEB DEVELOPMENT COURSE

Question	Agree or Strongly Agree
The community-engaged project deepened my understanding of academic course materials and content.	97.34%
The process of reflection helped me to clarify what I was learning in this course.	92%
In this course, I had the opportunity to analyze the community-engaged experience through the lens of Catholic Social Thought, Jesuit mission, and/or other faith traditions.	81.33%
Reflection gave me an opportunity to challenge my biases within the context of the community-engaged experience and course content.	90.66%
I made a worthwhile contribution to the community partner organization using skills and knowledge learned in the course.	100%
This community-engaged learning course has increased my knowledge about systemic causes of social problems.	93.34%
Knowledge shared by community members through the community-engaged experience was important to my learning in this course.	92%
This course made me realize that it's very important to be in service to my community throughout my lifetime.	93.33%
This community-engaged learning course has made me more able to work with diverse populations.	89.33%
This course gave me the opportunity to work with a community partner to design and implement solutions to social problems.	96%
This course helped me understand my role in disrupting injustice and promoting equity.	90.67%

Based on several iterations of this course, we learned that there are some challenges to implement this teaching framework. Both challenging and at the same time, time consuming, is that once a community organization partners with the course, their website needs are fulfilled and new organizations need to be identified for subsequent semesters, so the benefits of sustainable partnerships are not applicable to this course. Each semester, the instructor needs to locate new community partners and establish new partnerships, which is not trivial, with additional overhead for the instructor load. Some of these challenges have been eased by adding a community engaged learning associate student to the class and getting support from university's Associate Director for Community-Engaged Learning by reaching out to their networks. Additionally, the instructor needs to mentor one or two students as community-engaged learning associates, who also rotate off after one semester. Though, training provided to the community-engaged learning associates through the Center for Social Impact also proved beneficial.

## VII. CONCLUSION AND FUTURE WORK

Through the case study and the survey results, it can be concluded that the service based social justice learning is a more effective teaching method in comparison to traditional teaching methods. The community engaged learning not only helps students apply the web development concepts outside of the academic world into the real world, but also engages them in community service as they solve a problem for a local non-profit organization. By bridging the gap between technical proficiency and a commitment to social justice, our framework aims to cultivate a new generation of software developers trained under a culture of empathy and civic engagement. This paper also asserts that educational institutions can play a pivotal role in shaping a tech industry that actively contributes to social justice and community betterment, and better prepare them for social action.

The students feel positively impacted by the community engaged learning projects as they added to their overall learning experience. The community engaged learning component highly improved the course and enhanced student learning in the following areas:

- Collaboration and teamwork: Students learned how to work within a team and brainstorm ideas, develop the website and present their project to the community partner together. Working in a team for a real-world project gave them an opportunity to grow their project management, teamwork, communication, and collaboration skills.
- Exposure to real-world environment: The partnership with a local community organization helped the students develop a real Web application, customized for their mentor. The students had to take real time feedback and implement the changes which gave them experience of the real-world work environment.
- Community service and understanding social frameworks: Working with an organization and learning about their social causes helped the students develop a better understanding of how the world functions and made them aware of the social inequalities as well as social injustices. Success in this course also made them more willing to volunteer in the future and also share the social aspect things they learnt in class with others.

However, challenges in the implementation of this innovative curriculum are acknowledged, ranging from logistical considerations to the course setup and partners identification. We addressed these challenges transparently, offering insights into potential solutions and emphasizing the importance of ongoing refinement in response to feedback from both students and community partners.

Overall, this social justice service-based format of learning benefited students as well as the community partners. This course is also well suited for the Jesuit Catholic mission and

tradition and can be replicated with minimum amount of resources in other universities, especially our peer Jesuit institutions. We also plan to look into expanding this learning approach to other courses in our computer science and engineering curriculum and identifying potential sustainable community partnerships and projects that could continue over two or more semesters.

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