
Sustainable Redevelopment in Fitchburg: A Collaborative Faculty-Students-Community Engaged Project

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Abstract: Collaborative faculty-students-community engaged (FSCE) projects with strong pedagogical and innovative service-learning approaches can dramatically transform and expand higher education and curriculum outcomes. FSCE projects provide a platform for concerned stakeholders to share knowledge and learning opportunities by integrating community serving, which in many cases improves the quality and productivity of instruction. These projects focus on issues and can ultimately contribute to the well-being of the community. This paper focuses on a pilot study of the City of Fitchburg in Massachusetts, a 19th century industrial center that has now, like many other New England early mill towns, lost manufacturing and its base economy to other states and countries with lower labor costs. The infrastructure built over the last two centuries has stayed the same or is deteriorating and now needs to be repurposed and given a thoughtful upgrade. There are many critical factors that can be analyzed and addressed to make this city a better community to live, study, and work in. By conducting a pilot study, this paper identifies major issues and analyzes existing scenario of community connectivity involving concerned local stakeholders. The authors propose a research framework to conduct a FSCE project by collaborating with concerned stakeholders and community design experts. This paper presents three case studies where Fitchburg State University's faculty and undergraduate students were actively involved in the redesign of various city related projects that represent the significance of this type of collaborative and integrative faculty-students-community engaged project for enhancing community-engaged learning opportunities for undergraduate students.

1. INTRODUCTION

There has been a dramatic transformation of higher education and curriculum outcomes after the expansion of partnerships among universities, communities, and other organizations (Driscoll et al., 1996). Partnerships such as these not only connect faculty and students with communities and organizations but also provide a common platform for concerned stakeholders to: (i) share knowledge, (ii) learn by serving communities, (iii) integrate community serve-learning models into the academic curriculum, and (iv) provide an innovative pedagogical approach to realizing higher education's civic responsibilities. These partnerships ultimately improve the quality and productivity of instruction as well as address community problems (Bringle, Games, & Malloy, 1999; Bringle, Hatcher, & Games, 1997; Driscoll et al., 1996; Edgerton, 1995, Nicotera et al., 2011). Service-learning partnerships may fail though and not achieve their desired outcomes because of a lack of collaboration among team members, minimal institutional commitment, lack of administrative support, lack of faculty participation, and lack of funding (Morton & Troppe, 1996; Ward, 1996). Of these factors, faculty participation is the most critical (Ward, 1998) because implementing service-learning into a curriculum is based upon faculty commitment (Bringle & Hatcher, 1995). Studies show that there are various factors that motivate faculty participation in service-learning, such as, student course-based learning, relevance to course materials, self-direction, improved student satisfaction with education, personal involvement in service and enjoyment of working with students in co-

curricular settings, other student co-curricular factors, institutional recognition of service-learning as a scholarly activity, encouragement and faculty support by their administration and colleagues (president or chief academic officers, college deans, department chairpersons, and other faculty members), teaching strategy, institutional support for service-learning, the type of institutions, and academic discipline (Abes, Jackson, & Jones, 2002; Gray et al., 1999; Hammond, 1994).

Considering the benefits of a service-learning pedagogical approach, several universities have incorporated Faculty-Students-Community Engaged (FSCE) projects in their curriculum through various courses (especially senior design or capstone courses). For example, Driscoll et al. (1996) presented an assessment model for service-learning through comprehensive case studies of their impact on the faculty, students, community, and institution. Ma et al. (2016) also conducted research on service-learning's impact on faculty and developed a faculty engagement model.

This paper presents a framework to conduct a Faculty-Students-Community Engaged (FSCE) project. A FSCE project provides a common platform for all stakeholders (such as faculty, students, community representatives, local industry, professional organizations, and city officials) to identify existing issues in a community or city. FSCE projects also create dual opportunities for students in both learning and community service. This paper explains various stages in the research framework. This research not only contributes to the body of knowledge but also develops a foundation for designing a systematic strategy for the effective implementation of a FSCE project. In addition, this paper presents a pilot study that determined major issues in the Fitchburg community and three case studies on how Fitchburg State faculty and students contributed to the welfare of the city. Moreover, this paper explores and presents how to integrate learning outcomes from these projects into a program's curriculum.

2. BACKGROUND

Fitchburg, settled in 1730, is one of the older cities in Massachusetts. Officially, it was set apart from the Town of Lunenburg and incorporated in 1764. The city was named after John Fitch, one of the committee member that procured the act of incorporation. Fitchburg is known for heroism (Fitchburg History, 2020). This city is located in the northern sector of Worcester County and has an area of about 28 sq. mile. Based on population, it is ranked 37 out of 348 towns and cities in Massachusetts. Fitchburg was connected to Boston via railroad in 1845. By 1872, Fitchburg became a city with many primary institutions, such as a courthouse, hospital, library, opera house, and municipal buildings located in or near the downtown. It became an industrial center during 19th century through the use of water power, then coal and steam to operate its mills and factories. These factories produced machines, tools, clothing, paper, saws, chains, axle, grease, bicycles, shoes, and firearms. This city was later linked by rail to western markets with the completion of the Hoosac railroad tunnel in North Adams. Fitchburg is noted for its Victorian style architecture that flourished during this industrial expansion. The city has had a diverse population including Irish, Italians, Finnish, Greek, English, and French Canadians and more recently has added a sizable Latino and Hispanic population.

Fitchburg's golden years began to fade in the early 1900's. The upper middle class family began to move out to the suburban and neighborhood began to lose their economic diversity and stability. Local industries began to change ownership and move away. The business enterprise (shops, theaters, hotels, factories, and banks) slowly declined. Fitchburg, the industrial center of Massachusetts in 19th century, slowly collapsed during the 20th century (Fitchburg History, 2020). Currently, more than 18% of the city's population is below the poverty line. Because of the decline, most city buildings and infrastructure are aging and need effective strategies and planning to bring them back to their vibrancy of the past.

Fitchburg State University is a public comprehensive institution of higher education and has offered degrees since 1897. As an anchor institution within the city and the region, the university is now a prime employer and partner in the regional economic development and has initiated a collaborative outreach to Fitchburg and other surrounding communities. In the northeast, Fitchburg State ranks 51st in the U.S. News Ranking and World Report and 1st in the Commonwealth of Massachusetts among the regional comprehensive universities for social mobility (Fitchburg State University, 2019). Fitchburg State is

contributing to regional development with a designated strategy to: (i) produce a highly skilled and motivated workforce, (ii) expand and diversify the regional economy with job growth, & (iii) strengthen and expand the region’s small business base.

3. RESEARCH FRAMEWORK

Based upon literature reviews and past working experiences in similar community engaged projects, the authors have developed a research framework to conduct Faculty-Students-Community Engaged (FSCE) projects as shown in Figure 1. This is a generalized framework which can be updated based upon project requirements.

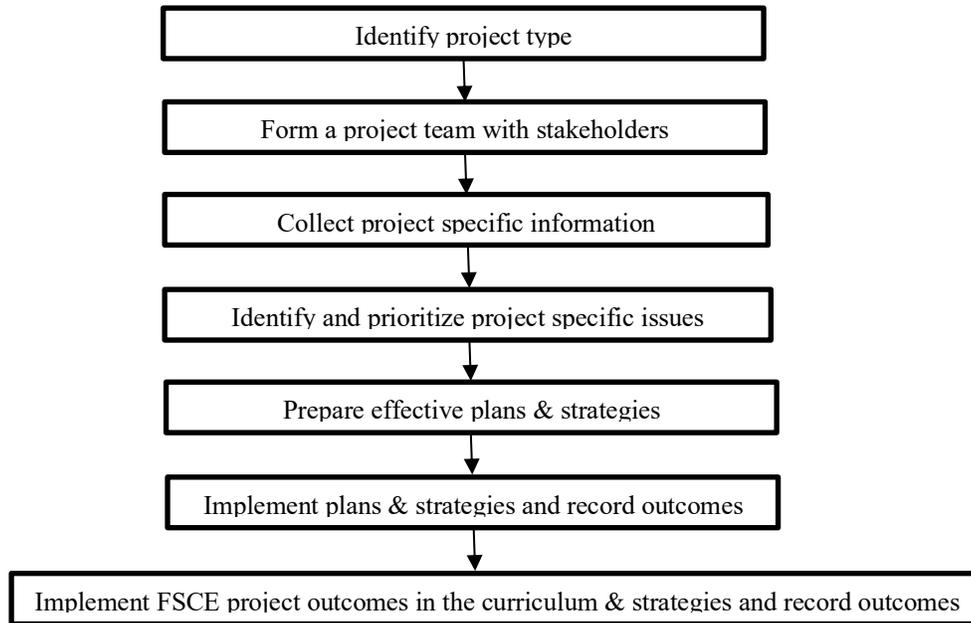


Figure 1. Research framework

As this paper is focused on determining major issues in Fitchburg and is directed toward the sustainable redevelopment of the city. The concerned stakeholders for this project are faculty, students, community representatives, and city officials. These form a project team inviting other faculty and industry experts as they are required. Project specific information is collected by adopting suitable methods, such as focus groups, survey questionnaires, interviews (Driscoll et al., 1996), and collection of feedback during community meetings and workshops. City/community specific issues are identified and prioritized by analyzing the data and conducting broad discussions among the concerned stakeholders. Through extensive discussion, investigation and design, effective plans and strategies are then prepared for implementation toward sustainable redevelopment in the city. The collected information, detailed plans, strategies, and outcomes from the project are recorded and shared among all concerned parties for review and adaptation. Upon completion or during the working process, achieved learning outcomes are further integrated and adopted into the relevant course curriculum for future students.

4. PILOT STUDY

A pilot study was conducted to identify the major issues in the Fitchburg community. A preliminary questionnaire survey sheet was designed that consisted of eight sections: quality of life, community characteristics, business and population growth, code enforcement, community safety, personal safety, service quality, and government service overall. For this preliminary study, the focus group consisted of Fitchburg State students who reside in Fitchburg and their relatives and friends who live in Fitchburg.

According to the survey report, most participants mentioned these issues:

- Unemployment and poverty, and noted that many people with jobs need to travel Boston and Worcester
- City infrastructure, such as roads, buildings, and bridges are aging and need regular maintenance. Bridges and structures should be monitored and tested for structural stability.
- Downtown is mostly empty and needs a strategy for new business and reuse.
- Public safety and reduction of crime
- Senior citizen and others demand more frequent public transportation

The university and city have coordinated to address some safety issues by installing surveillance systems to monitor possible criminal activities. The university is also renovating a downtown theater building incorporating some university course classrooms, meeting rooms, and an Idea Lab helping to bring some activities back to downtown.

5. RESULTS & DISCUSSION

The preliminary study indicated that unemployment, aging infrastructures, public transportation, and safety are the primary issues for Fitchburg. This paper presents three case studies related to aging infrastructures issues, typically building and area development projects. All of these projects were Faculty-Students-Community Engaged (FSCE) projects, and are briefly explained in the following section.

5.1 Case 1: Fitchburg City Hall Area Development

The two-story Fitchburg City Hall, built in 1853, has Italianate design features a granite foundation, brick walls and pilasters, brownstone and terra cotta details, granite lintels, and a slate roof. The building had offices on the first floor and a large public meeting room with a balcony on the second floor that was later transformed into additional city office space. The 166-year-old City Hall was declared unsafe for habitation in 2012 after a broken roof truss was found (Semon, 2019). As this building is a symbol of pride, resilience, and strength in Fitchburg, Prof. Keith Chenot found this issue as an opportunity for architecture students to develop their knowledge and skills by seeing and understanding real property conditions, experiencing a lack of commercial and residential density in this urban space, and its potential for redevelopment. A total of eleven Architectural Design I students were involved in the “Fitchburg City Hall Area Development” project. The project team not only restored and redesigned City Hall but also expanded the redevelop plan to nearby underused buildings and vacant properties adjacent to the river (shown in Figure 2). The students presented their project to the mayor, other city officials, the Historical Commission, invited citizens, and the press. City Hall is currently under reconstruction and is expected to be complete by fall 2020.

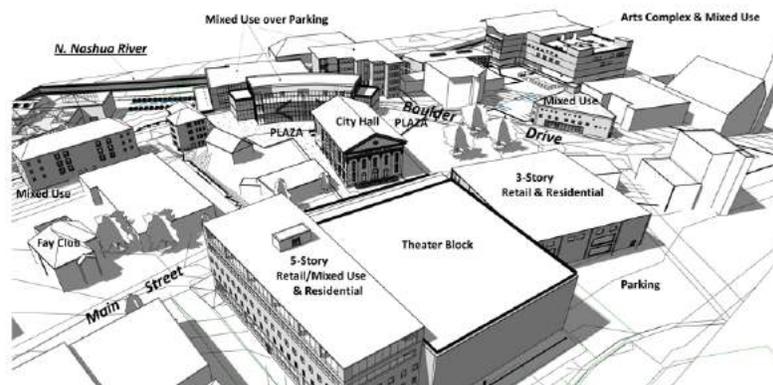


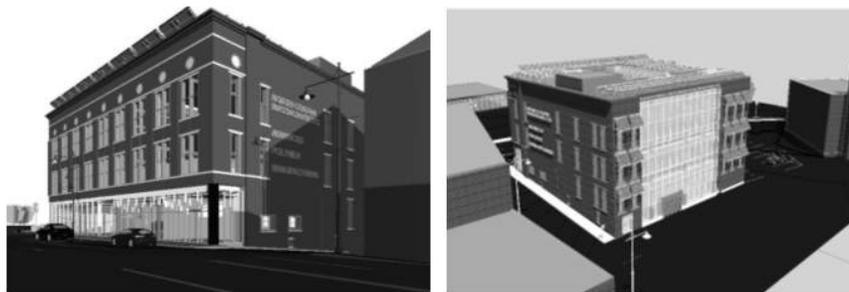
Figure 2a. Fitchburg city hall area development (courtesy: D. Keith Chenot)



Figure 2b. Fitchburg city hall area development (courtesy: D. Keith Chenot)

5.2 Case 2: Feasibility Study on an Advanced Polymer Manufacturing Research, Technology Transfer and Training Facility

North Central Massachusetts, especially Fitchburg, Leominster, and Gardner had been recognized as a hub for manufacturing industries (mainly the plastics industry) for a long time (Worcester Business Journal, 2012). Backed by the local Chamber of Commerce, manufacturers expressed their need to experiment with new methods and technologies to improve productivity and profitability, but they lacked the facilities and expertise for research, experimentation, and workforce training. Other studies have shown that local manufacturers need workforce training and education program, training facilities, and technological advancement to sustain their industry (University of Massachusetts, 2000). Considering this reality, Prof. Keith Chenot and eight student interns conducted a feasibility study and analyzed the potential for an advanced polymers research, technology transfer and training center in an unused commercial building on lower Main Street in Fitchburg (shown in Figure 3). The student team coordinated with Regional Economic Development Institute (REDI) project Director (Dr. Joshua Spiro), the North Central Massachusetts Development Corporation, and the North Central Massachusetts Chamber of Commerce. The team redesigned the existing four-story commercial building and added energy saving features, such as daylighting with solar control, a south facing energy wall, PV solar rooftop arrays, and a geothermal ground-sourced HVAC system. The new design consisted of business incubator offices, shared conference rooms and classrooms, administrative offices, and experimental manufacturing laboratories (such as nano-polymer lab, cleanroom labs, machine shops).



**Figure 3. Advanced polymer manufacturing research, technology transfer and training facility
10 Main Street, Fitchburg, MA (courtesy: D. Keith Chenot)**

5.3 Case 3: An Amazing Plan for Moran Square, Fitchburg MA

In collaboration with the Fitchburg Redevelopment Authority & Consultant Jerry Beck, Prof. Keith Chenot and his eight Architectural Technology students coordinated a revitalization plan for Moran Square, the eastern terminus of Main Street in Fitchburg and also near the university. This redesign incorporated a mix of residential and small business spaces that would provide a synergy that builds and supports a vibrant community and also provides employment for residents and university students. They also studied the open space between a plumbing supply building and the MART intermodal terminal to enhance an existing park by creating a small memorial park that would feature the re-sited Spanish-American War monument, a new space to honor Gulf War veterans, and additional open landscaped areas. Their scheme converted existing open parking to a public park featuring water features and skating in the winter. In addition, they studied streetscape improvements supporting pedestrian areas and crosswalks, and developed creative nighttime lighting to feature the historic buildings in the area and heighten the excitement of Moran Square (as shown in Figure 4).



Figure 4. Proposed plan for Moran Square, Fitchburg, MA (courtesy: D. Keith Chenot)

6. CONCLUSIONS

This paper presents a research framework to conduct a collaborative Faculty-Students-Community Engaged (FSCE) projects, which is an innovative pedagogically rich service-learning approach to education. FSCE project provides a common platform for all concerned stakeholders to share ideas and knowledge to research and resolve existing community issues. It also creates dual opportunities – learning and community service opportunities – for students involved in the project. The authors conducted a pilot study to determine the major issues in Fitchburg by conducting survey questionnaires among a focus group. The three case studies by Fitchburg State faculty and students show how these projects can contribute to the welfare of a community. These projects can also be an aid to urban planners and local authorities in planning and executing effective strategies toward positive and sustainable redevelopment in their community. Through the use of this type of project, students gain insight into their ownership and responsibilities citizens in their community. In addition, this paper explores and reports how to integrate the learning outcomes from these projects into the future curriculum. This type of project can be a foundation and a common learning platform for students who want to be involved in real-world projects for their senior level projects, such as a capstone course. It is necessary to identify suitable courses that can incorporate the outcomes from a project, based upon the characteristics of project and individual course objectives. Lastly, service-learning partnerships in the FSCE projects highly depend on true collaboration among their team members and having robust institutional commitment, faculty participation, administrative support, and proper funding.

7. ACKNOWLEDGEMENTS

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