

## **Promoting environmental sustainability through service learning and community capacity building**

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### **ABSTRACT**

Community-based service learning provides opportunity of civic engagement and allow students to make real contribution to people's lives in their own community. Through this service learning subject, the paradox of excess and deprivation, exemplified by abundant food waste and poverty, was addressed through campus-community partnership. Some aspects of empowering pedagogy advocated by Shor (1992) were adopted to facilitate learning experiences which are participatory, problem posing, and democratic. The problem solution projects fostered a dialogic and active learning experience. The learning outcomes showed that students have acquired a change-maker mindset and developed a strong sense of civic responsibility in promoting a sustainable environment. Through multi-disciplinary team work and concerted effort with community stakeholders, students had the chance to develop generic competence in problem-solving, inter-personal effectiveness, and their creativities. The experience also has an impact on their personal values and behaviors. The capacity of the community was enhanced by the solutions co-created by the students and partner organization.

Key Words: Environmental sustainability, Food waste, Service-learning, Problem Solution Project, Community capacity-building

### **1. INTRODUCTION**

Very often, higher education is being criticized for the lack of connectedness between traditional curricula content with the needs of the society. Around the world, service learning flourished in higher education against a backdrop of the call for civic engagement and inter-disciplinary response to community needs. Empirical evidence is abundant to show the positive impact of service learning on academic achievement and other generic competence among college students. Service learning enhances students' learning outcomes, foster a more active citizenry, support a more equitable society; reconnect universities with their local and regional communities (Austin et al, 1999; Benson et al, 2007). The introduction of mandatory service learning is an active response to the mission of the Hong Kong Polytechnic University to nurture graduates who are critical thinkers, effective communicators, innovative problem solvers, as well as commitment to serve mankind. The positive impact of service-learning on personal and interpersonal development, cultural awareness, civic responsibility and personal growth are supported by numerous empirical researches (Astin & Sax, 1997; Brandes & Randall, 2011; Kronick & Cunningham, 2013; Meyers, 2009). Community-based service learning, in particular, could enhance students' awareness of citizenship and serving the society with what they had learnt in class (Morgan, 2001).

Hong Kong is facing environmental challenges of global warming and environmental devastation. Poor air and water quality, over-consumption of food and goods, excessive household wastes all posed threats to the sustainability of our environment. The municipal solid wastes (MSW) issue, in particular, warrants our special attention. We are now sending more than 9,000 tons of solid wastes to the almost saturated landfill and one-third of them are consumable food (Environmental Bureau, 2012).

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Paradoxically, one in five Hong Kong citizens lives on income below the poverty line while about 3500 tons of food waste is disposed of every day. One in four children does not get three meals a day and one in three elderly struggles to meet their basic nutrition needs.

Tackling the food waste issue is top on the policy agenda of the Environment Bureau. In the policy paper published in 2013 “Blueprint for Sustainable Use of Resources 2013 - 2022”, it is the Hong Kong Government’s goal to reduce food wastes by 40% by 2022. To this end, the government encouraged multiple actions to prevent and reduce wastes, including government policies and programmes to incentivize food waste reduction, separation and collection, as well as to provide the necessary infrastructure for recycling and treatment. Among the many proposed strategies, mobilizing community participation is perceived as one of the keys to achieve this goal.

Against this backdrop, a service learning subject was launched to cultivate civic responsibility, social awareness and empathy among undergraduate students through inspiration, reflection and civic engagements in addressing the food waste problem. We also expect students to demonstrate attributes of a critical thinker, innovative problem solver and socially responsible citizens through the service learning experience. We have chosen a locality-based civic organization as our community partner which aims at creating a sustainable community through networking and community capacity building. The short-term goal of the organization is to redistribute consumable food items to low income families in the community, and hence reducing food waste and alleviate poverty at the same time. The long term goal is to achieve environmental sustainability by inducing lifestyle change among major stakeholders in the community. These missions coincide with a major theme of the Green Campus Campaign at the Hong Kong Polytechnic University to reduce food waste, providing a fertile ground for campus-community partnership. Through students’ service projects, the university developed a community-based approach to environmental sustainability through community capacity building. This gave students a chance to demonstrate the relevance of what they had learnt in the university and allows students to make real contribution to people’s lives in their own community.

## 2. DESIGN AND KEY FEATURES OF SERVICE LEARNING

### 2.1 Learning Process

Kronick, Cunningham and Gourley 2011 developed a framework for service learning which focus on sensing, reflecting, and acting. Inspired by this framework, this service learning course comprised of three key phases:

a) *Inspiration and input phase* – students were equipped with the necessary knowledge and skills in carrying out the community service, including the exposure to different strategies to handle food waste, skills workshops on creativity, teamwork and service planning and implementation. Inspiration was brought about by exposure to successful experience, agency visits, and sharing of experience by young role models who have made contribution to maintaining a sustainable environment.

b) *Reflection phase* – reflection is an ongoing process throughout the course. Students are encouraged to think more deeply about how the community service/project have challenged and impacted on their learning as well as their personal growth, their critical appreciation of food waste problem in Hong Kong, their understanding of the service recipients, and how they can contribute to resolve the problem with innovative solutions.

c) *Experiential learning and acting phase* – There are two stages of students’ experiential learning. In the first stage, students participated in the collection of vegetables and other food items

from the local wet market and other vendors and distributed these consumable food items to low income families. In the second stage, students worked closely with the partner organization and different stakeholders to identify new strategies to reduce food wastes in the community.

## **2.2 Pedagogy approach and key features**

The teaching and learning approach of this service learning subject is inspired by the critical pedagogy advocated by Shor (1992) to provide empowering educational experiences for students which is participatory, problem-posing, dialogic and democratic.

*a) Problem-based learning and co-creation of solutions* – Problem solving is described as a higher form of intelligence and the best way to learn about something is to try to change (Lewin, 1935). Service learning using Problem Solution Projects have been shown to be an empowering learning experience for students (Stenhouse and Jarrett, 2012). From their direct service experience, students in this service learning subject identified problems and obstacles which impeded the agency from achieving its goals, such as the lack of community awareness of the food waste problem, inadequate publicity and support from stakeholders, and other logistic arrangements. Based on their interests and strengths, students were given the freedom to propose workable solutions to address these problems. In the process of co-creating solutions, students were encouraged to make good use of their academic knowledge and skills, such as design, marketing, health care and logistics.

*b) Participatory and democratic learning process* – we maximized students' participation by avoiding a rigid structured service learning which may disconnect from their interests and expertise. Students had more control over their own learning experience since they were free to form their project teams, selected their team leaders, and worked on solutions of their own choices. Through reflective seminars, students engaged in active dialogues with the tutors and the community partners. Constant feedbacks were provided to the project teams on the feasibility and desirability of the solutions proposed by students.

*c) Change-maker mentality* - In addition to the generic goals of service learning, we are conscious to cultivate a change maker mentality among the students. We believe that our students can become agents of social change if they are inspired by good role model and be given the opportunities for civic participation. Throughout the course, students were encouraged to believe in themselves and the potential impact which they might bring to the community.

## **3. IMPACTS ON STUDENTS' LEARNING OUTCOMES AND IMPACT ON THE COMMUNITY**

The service learning experience did have impact on both students' learning outcomes as well as the community. We gathered quantitative and qualitative evidence from the pre-and-post service learning survey conducted by the university, students' two reflective journals, as well as the verbal feedback collected by the tutor during reflective seminars and a focus group interview conducted three months after the end of the course.

The pre-and-post surveys measured (i) the impact of the Service-Learning (SL) experience on the development of students' generic competencies including interpersonal effectiveness, teamwork, problem-solving and social responsibility, (ii) evaluate students' SL experience, and (iii) collect student feedback and suggestion for improvement on the SL subject. The findings show a statistically significant improvement in two of the four generic competencies measured, including problem-solving and social responsibility. However, interpersonal effectiveness and teamwork have also been improved; though not statistically significant (see Table 1a & 1b).

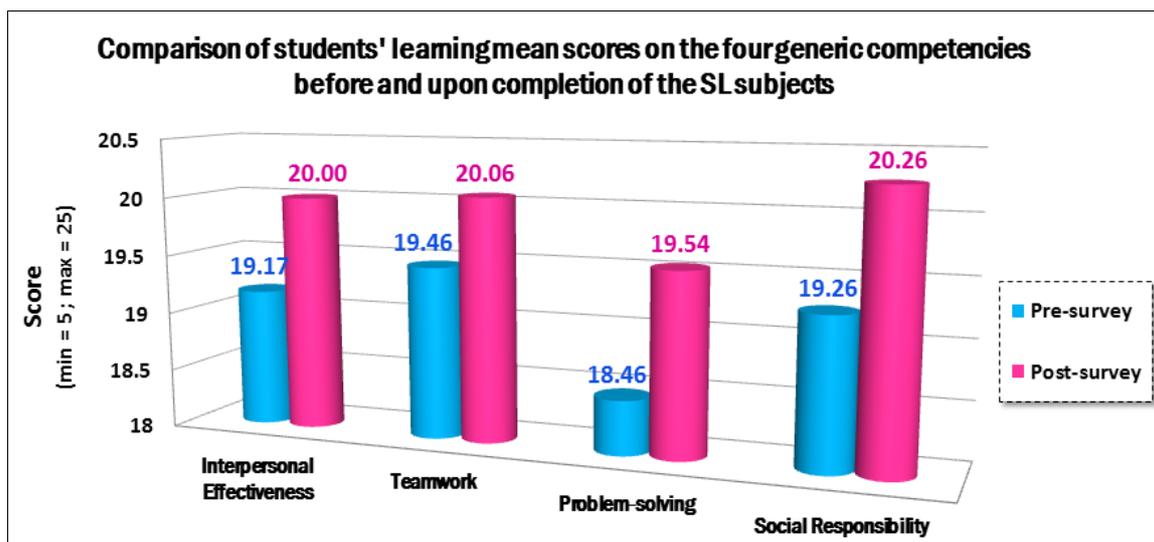


Table 1a – Results of the Pre-and-Post Survey of the service learning subject

Generic/soft skills	Students' SL Learning Status	Mean scores	Differences in mean scores	Sig. 2-tailed	Effect size
Interpersonal Effectiveness (IE)	Pre-SL	19.17	0.829	0.067 (NS)	0.377
	Post-SL	20.00			
Teamwork (TW)	Pre-SL	19.46	0.600	0.107 (NS)	0.290
	Post-SL	20.06			
Problem-solving (PS)	Pre-SL	18.46	1.086	0.023*	0.471
	Post-SL	19.54			
Social Responsibility (SR)	Pre-SL	19.26	1.000	0.020*	0.416
	Post-SL	20.26			

Table 1b – Statistics on the Pre-and-post Survey

\* Significance at the p=.05 level; NS = Not Significant

The feelings and thoughts expressed by the students throughout the course echoed with the quantitative results of the pre and post surveys. The following direct quotes from students' reflective journals and the focus group provided more qualitative evidence on their learning outcomes.

**Enhanced civic responsibility** - through the actual experience of collecting consumable food from the community, students recognized the magnitude of the food waste problem and how low- income families were able to benefit from the food recycling services. They developed a great sense of civic responsibility and realized the importance of a concerted effort by different stakeholders in the society to work towards environmental sustainability.

“I realized that collective effort by the citizens can be very powerful in addressing the food waste problem. We acknowledge the problem, we discuss, and we act! Judging from the volume of food waste we have collected in Hung Hum district, I can imagine how serious the food waste

problem is in Hong Kong and for the rest of the world.” (Student W, Design, Year 2)

“Before I attended this course, I never realized food waste is a problem. From now on, I will try my best to reduce food waste in my daily life and also urge my family and friends to care about this problem. This is our responsibility to reduce food waste and to share food with those in need. ....I understand that the project nature, or what we do in the service, is not the sole factor contributing to the success of a service project – as it can depend on other key factors; environment, administrative stuff, manpower, and so on, and all these , are actually what can make a service project challenging, but at the same time, interesting.”(Student L, Physiotherapy Year 2)

“The community service we participated really helps a lot in reducing food waste and benefits the needy families. At the same time, the project can also change the attitude of stakeholders in the community towards food wastes, including volunteers, donors and the food recipients.” (Student H, Radiography, Year 2)

**Change-maker mentality** – students acquired a change-maker mentality through direct interactions with low-income family and singleton elderly who benefitted from the food recycling project, as well as the collective effort of different stakeholders.

“I put the theory into practice through the learning and services. Every people can make a difference to our planet and every people are responsible to make our world better. (Student C, Mainland student, Electrical Engineering Year 2)

“I think the food waste issue can be resolved but it needs the contribution of all stakeholders... every citizen has his/her own responsibility to help addressing the problem since “everyone is a change-maker”. (Student H, Radiography, Year 2)

**Improved problem-solving and other generic skills** - for many students, the experience of working with students in different academic backgrounds not only created synergy in problem-solving, but also enabled them to polish their team work skills, and to appreciate the strengths of other professionals. The language and cultural barriers were also overcome by a mix of local and mainland students in the team.

“Throughout the course, we worked in teams....my leadership skills, interpersonal skills, problem-solving skills and critical thinking is improved. ....The learning experience helps me discover my own strengths and weaknesses. I am quite good at coordination and managing people. This sheds light on my long-term personal and professional goals” (Student J, Marketing, Year 2)

“I learned how to work with people with different interests and personalities in the process. ....For example, my major study is in accounting but my teammates include students from designing as well as the engineering. I learn a lot from my teammates during the working process. ....This greatly inspired us to think of feasible ways based on our personal strengths and major differences, and then we discussed each way and selected the most innovative solutions to the problem. (Student Y, Accounting, Year 2)

“Also, I have learnt lots of new knowledge and practical skills. I have learnt many professional knowledge of how to reduce food waste and different means to solve the food waste problem...” (Student S, Design, Year 2)

**Personal and professional growth** - Inspired by the service learning experience, some students were able to gain some insights for their personal growth, future civic engagement and professional development:

“I saw changes in my mindset and behaviors after I studied the course, and I am able to see and do things from an angle that I may not be aware of. Besides all these changes, there are some moments that I also recorded personal growth and reflection for myself.....one thing I gained most and learnt most in this class is, indeed, LOVE. In this service learning course, I saw love between people, people that may not even know each other.....and yet willing to share with those in need” (Student M, Physiotherapy, Year 2)

“As a citizen, I think I have a responsibility to educate my next generation not to waste food and respect the environment. “If possible, in my future profession, I would like to come up with some designs which allow people to grow their own food in their apartment.” (Student Y, Design, Year 2)

“Moreover, this course reminds me that I should not forget our society while I am fighting for my dream. Thus, even if I am busy working in the weekdays, I must spend time to join volunteer works to care our society and our planet. I can become more “humane” rather than just a money earning machine.” (Student W, Financing Service, Year 2)

This service learning subject also has demonstrated its impact on the community. In this service learning subjects, students were able to work closely with our partner organization to achieve its goals - sharing consumable food with needy families in the short-run and reduce food wastes in the long-run. Students proposed workable solutions to enhance the existing food waste collection and distribution process through better logistics, publicity, and volunteer mobilization. On the other hand, pilot community education campaigns were launched in nearby public housing estates to raise community awareness on the food waste problem, introducing practical knowledge and skills to the residents in an effort to reduce food wastes. More importantly, a network of community stakeholders, including local

vendors and shop owners, church, non-profit organizations, Housing Authority and Housing Societies, was build to work towards this common goal. Although this service learning subject may not create substantial impact on the amount of food being recycled, it does strengthen the capacity of the community to achieve long-term environmental sustainability.

To conclude, this service learning subject is an attempt to address the problems of food waste and poverty through campus-community partnership. The community-based approach of service learning created a win-win situation for both our students and the community. Students acquired a change-maker mindset and developed a strong sense of civic responsibility in promoting a sustainable environment. Through multi-disciplinary team work and concerted effort with community stakeholders, students had the chance to develop generic competence in problem-solving, inter-personal effectiveness, and creativity. The service learning experience also has an impact on their personal values and behaviors. The capacity of the community was also enhanced by the solutions co-created by the students and our partner organization. These outcomes echoed with the research findings of Eyler and Giles (1999) that student learning and community benefit should be simultaneous in a well-balanced service learning program.

#### **4. REFLECTION ON PEDAGOGY**

The problem solution projects were designed to include the participatory, problem posing, and democratic choice-making aspects of Shor's empowering pedagogy. To gather more information on the effectiveness of this approach, a focus group interview was conducted three months after the course, attended by ten students. The participants were representatives from the six problem solution project teams and they came from six different academic disciplines.

To the students, the opportunity to choice their own learning experience was very important. The freedom to select one problem from their brainstormed list fostered a dialogic and democratic process of learning. Students had to engage with each other and learnt the art of compromising and democratic decision-making. This was especially the case when the group was composed of students from different academic disciplines, or students from mainland China. Although the students could only implement part of their proposed solutions to address their identified problems, they took pride in what they had done and gained great satisfaction from the actualization of their plans by the community partner. Students, tutors and the agency work together as equal partners to co-create solutions. It was not difficult to find in students' reflective journals that they felt that they could make a difference in reducing food waste in the local community, and appreciated the importance of concerted efforts to create a bigger impact on the environment. In sum, it seems that the process of brainstorming, problem posing and finding solutions did turn out to be an empowering learning experience for the students.

By linking theory and practice, reflection and experimentation, service learning opens up the learning process which can accommodate different learning styles of students. Although this pedagogy approach was well-received by a majority of students, it might not work for a few students who regarded service learning as just another mandatory requirement of the university. Furthermore, a student-centered, participatory approach of learning may imply less control over the learning process by the teachers involved. They must have the readiness to accommodate different learning needs of the students, and to provide timely guidance and support along the way.

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