

# Designing a better environment through analysing the built environment

Barbara W.Y. Siu

**Abstract** According to its oldest definitions, civil engineering is a very broad discipline that deals with the design, construction, and maintenance of the physical and naturally built environment. It has been widely accepted that built environment is one of the major supports to public health and quality of life. This chapter is dedicated to a service learning subject lead by the Department of Civil and Environmental Engineering at the Hong Kong Polytechnic University that engages students in studies of the built environment. Students work alongside with the service clients to gain first-hand understanding of the problems faced by the end-users, which helps them to reflect on the conventional top-down design approach. The quantitative and qualitative data obtained by students not only helped them in devising improvement suggestions to service clients and public authorities, these data also forms part of district database and can be used in setting performance targets and monitoring progress. Apart from the benefits to community, there has been observations in students' academic, professional, and personal developments, as well as positive impacts in service clients' quality of life attributes.

**Keywords** service learning, age-friendly city, built environment, engineering education, university students

**Subject Index Terms** aging, active aging, age-friendly city, community engagement, service learning, direct service, indirect service, university education, engineering education, experiential learning, community partnership, civic engagement, quality of life, built environment, Civil Engineering, Faculty of Construction and Environment, community assessment, service projects, students' learning, community impacts, student development, home environment assessment, home visits, tours, transportation, outdoor spaces and buildings, housing, old urban area, urban renewal, reflection

Barbara W.Y. Siu (✉) Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Hunghom, Hong Kong

e-mail: [barbara.siu@polyu.edu.hk](mailto:barbara.siu@polyu.edu.hk) – corresponding author

# 1 Background – Human and Built Environment

The word “built environment” has been defined in different ways. Most generally, it is the part of the physical environment that is constructed by human activity. By one definition, the built environment consists of the following elements: (1) land use patterns, the distribution across space of activities and the buildings that house them; (2) the transportation system, the physical infrastructure of roads, sidewalk, bike paths, etc., as well as the service this system provides; and (3) urban design, the arrangement and appearance of the physical elements in a community (Cunningham & Michael, 2004; Roof & Oleru, 2008; Saelens & Handy, 2008). The built environment has a strong correlation with public health (Cunningham & Michael, 2004; Koohsari, Badland, & Giles-Corti, 2013; Roof & Oleru, 2008; Saelens & Handy, 2008) and quality of life (Engel, et al., 2016).

According to one of its oldest definitions dated back in 1828, a Civil Engineering’s work is “*the art of directing the great sources of power in nature for the use and convenience of man*” (The Institution of Civil Engineers, 2017). Civil engineering is a very broad professional engineering discipline that applies the knowledge of mathematics and physical sciences to deals with the design, construction, and maintenance of the physical and naturally built environment. The Department of Civil and Environmental Engineering is thus the best candidate at the University to take the lead in introducing a service learning subject that focus on the linkage between human and built environment.

Students from the science and engineering disciplines are expected to apply their knowledge in science and technology in improving the built environment for the well-being of the community. The service learning subject described in this chapter serves as a platform for students from these disciplines to work in a multi-disciplinary team to identify and investigate built-

environment related problems faced by the underprivileged group with quantitative and qualitative techniques, and devise solutions from a *human-centred approach*.

## **2 Subject and Service Design**

The service learning subject, “CSE3S01 – Built Environment Enhancement for Underprivileged Communities” was first introduced in Summer, 2013/14 with initial intake of 50 students. This subject has been offered once or twice per academic year since then, and 285 students have taken this subject up to date (end of 2017). The objectives and intended learning outcomes for students are highlighted in Box 1 and Box 2 below.

### **Box 1. Objectives of CSE3S01**

The objectives of this subject are:

1. To introduce to students the concept and practice of service learning.
2. To raise students' awareness of the problem with the build environment in Hong Kong and educate them on the challenges and needs of the underprivileged communities.
3. To provide students' an opportunity to apply their classroom knowledge in solving real-life problems in local communities.
4. To raise students' awareness of their role as a professional in society.
5. To enhance students' generic competence of innovative problem solving, communication and teamwork.

### **Box 2. Intended Learning Outcomes of CSE3S01**

Upon completion of the subject, students will be able to:

- a. Demonstrate an understanding of how built environment enhancement improves the welfare of the community.
- b. Propose and evaluate alternative solutions to address the needs of the underprivileged.
- c. Reflect on their role and responsibilities as a professional.
- d. Work effectively in a multi-disciplinary team to solve problems and communicate effectively with clients and stakeholders.
- e. Demonstrate empathy for the underprivileged and a strong sense of civic responsibility.

## ***2.1 Nature of Service Activities***

The educational benefits and community benefits are realized through service activities which requires students to:

- Identify built environment-related problems that underprivileged people (or communities) are facing with quantitative and qualitative techniques;
- Develop feasible solution(s) to address the problems identified together with the beneficiaries;
- Communicate their proposals to community partners and/or beneficiaries through reports/ exhibition/ talks.

### **2.1.1 Service deliverables**

Apart from improvement proposals/ plans, alternative kinds of deliverables may be produced to suit the objectives of the community partner and the needs of the service clients, for example a

thematic report after a more extensive research-type study, which will form as an important source of information for the community partner or even the policy-maker to identify service improvement opportunities, the results of this kind of thematic study can be disseminated to the general public as a social awareness exercise. In principle, the outcome of the service project should either directly serve the needs of the beneficiaries, aid the community partner to improve their service provided to the beneficiaries, or advise the policy-makers on better decision-making process to improve the welfare of the beneficiaries in a long run.

## ***2.2 Flexible types of service projects***

The overall subject and service project framework has been set in a generic way so as to accommodate a wide range of built-environment-related community projects. For example, potential projects/ topics may include:

- Age-friendly community
- Indoor air quality monitoring and improvement strategies which is helping elderly with chronic respiratory diseases
- Roadside pollutant exposure and health studies to make recommendations on changing walking path choice for school children who mainly go to school on foot
- Investigation on the locations of addition of footbridges or at-grade road crossing facilities to improve the mobility of the elderly and disabled persons in the community
- Walkability survey (availability and quality of pedestrian infrastructures) and walking behavior study (origin, destination, duration, path, conditions of walking environment) of the elderly or low-income group that will lead to suggestions in improving town planning and

pedestrian facilities design and services standards (such as width of walkways, shelter/ trees, pavement condition, green time of pedestrian crossings)

- Public transport affordability and travel pattern of the low-income groups to make suggestions to alleviate the situation of transport poverty and social exclusion

### **2.3 Educational benefits**

Through interaction with the service clients during the service projects, the students would be more aware of their professional role, i.e. to build a better world for people to live in, in which *human element* is an indispensable part. Students would gain personal experience in the mismatch between the outcomes of the top-down approach in the design and operation of the built environment and actual needs of the end users. During the project, students would develop empathy on the underprivileged and contribute their professional knowledge to improve the design and management of the built environment to suit the needs of their service clients. The benefits of service projects extend beyond the semester. As students graduate and take on a career in the planning and management of the built environment, their experience of applying professional skills to address human needs would be converted to a positive attitude, and this is going to benefit the community in a fundamental way.

## **3 Ageing and Age-friendly city**

As introduced in section 2.2, the subject framework has been made rather flexible in addressing various kinds of built-environment-related community issues; the subject's major focus has been set on *Age-Friendly City* since its first offering in Summer, 2013/14 because the subject team sees

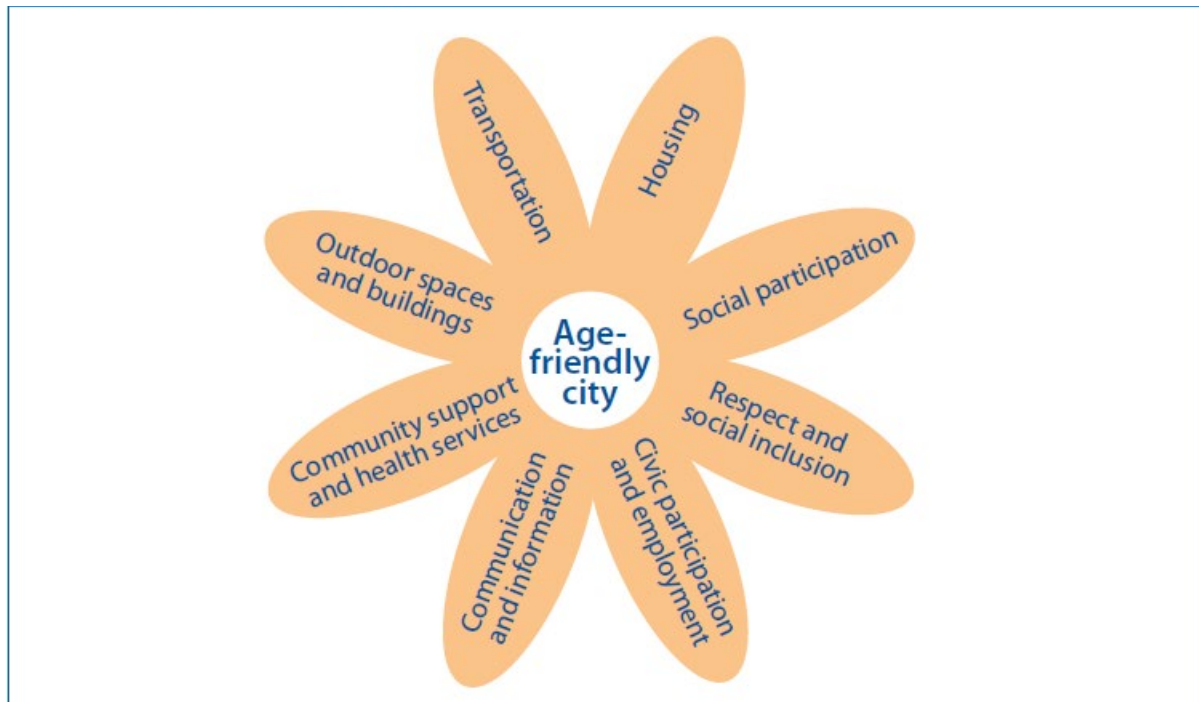
“How Hong Kong is going to embrace the rapidly aging population?” as our major challenge in the coming decades.

Aging population and urbanization are two important forces shaping in the 21st century. The percentage of world’s population over 60 will double from 11% in 2006 to 22% in 2050; also, by 2030, about 3 out of every 5 in the world will live in cities (World Health Organization, 2007). As of 2016, out of the 7.33million total population of Hong King, 15.9% are aged 65 and above. 32.3% (or 811,645) of households in Hong Kong are with elderly persons, and around one-third of these households are elderly-only households (Census and Statistic Department, Hong Kong Special Administrative Region Government, 2016). The percentage of elderly population (aged 65 and above) is expected to increase from 15% in 2014 to 28% in 2034 and 33% in 2064 (Census and Statistics Department, Hong Kong Special Administrative Region Government, 2015). How to adequately serve the needs and enhance the quality of life of elderlies in the urban setting is thus an urgent challenge.

To cope with the increasing elderly population in cities, WHO introduced the active ageing policy framework in 2002, and adopted the definition of active ageing as: “*Active ageing is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age*” (World Health Organization, 2002). Subsequently, the Age-friendly City framework was introduced in 2007 that spelt out more explicitly the eight important elements to active ageing: “1. Housing”, “2. Transportation”, “3. Outdoor space and building”, “4. Social participation”, “5. Respect and social inclusion”, “6. Civic participation and employment”, “7. Communication and in-formation”, and “8. Community support and health services”. The first three elements are related to the *physical environment* and overlaps with the academic focus of the Faculty of Construction and Environment. These common areas make “age-friendly city” an ideal



platform to design a service learning subject that bring benefits to the community while realizing the intended educational outcomes.



**Fig. 1** Age-friendly City Topic Areas (World Health Organization, 2007)

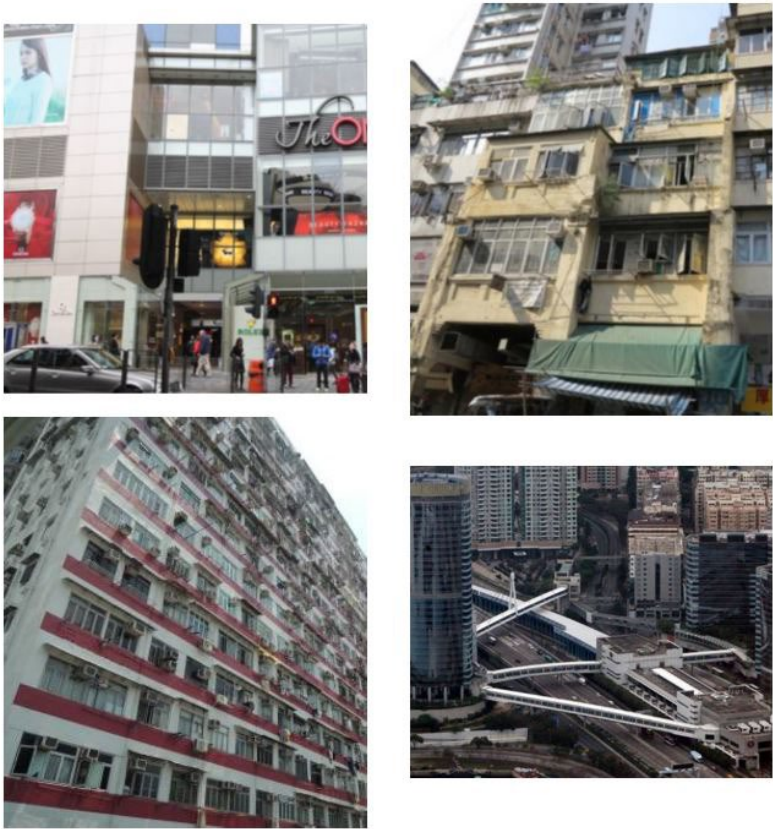
### ***3.1 Service Site – Yau Tsim Mong district***

The Age-Friendly City project is implemented in an old urban district – Yau Tsim Mong district through close collaboration with the major elderly service center in the area (Salvation Army Yaumatei Multi-service Centre for Senior Citizens).

Yau Tsim Mong district is situated in the Kowloon Peninsula. In its compact area of 6.99km<sup>2</sup> (Survey and Mapping Office, Lands Department, Hong Kong Special Administrative Region Government, 2016), it houses 342,970 people, that is a population density of 49,065 person per km<sup>2</sup>, the second highest in Hong Kong. Despite of its high residential density, Yau Tsim Mong

district is also a major business and tourism center. Yau Tsim Mong district is a mix of the old with the new, while some older areas are undergoing urban renewal, there are new developments as well, it offers excellent opportunities to bring in and to enhance age-friendly elements in this district.

**Fig. 2** Yau Tsim Mong District – A Mix of Business, Residential, Tourism, Old, and New



**3.2 Service Projects**

As described in the Section 3 and Fig. 1, there are 8 focus areas in the concept of age-friendly city, and

this subject is directly related to the three elements related to built environment summarized in Box 3 below.

**Box 3 – The three AFC focus area in CSE3S01 (adapted from (World Health Organization, 2007)**

*AFC Focus Area #1 – Outdoor Spaces and Buildings*

- Characteristics of urban landscape and built environment
- It has major impact on *mobility, independence and quality of life*
- Directly related to the ability to “age in place”

*AFC Focus Area #2 – Transportation*

- Accessible and affordable public transport is a key factor influencing active aging
- Being able to move about the city is essential to *social and civic participation*, as well as access to *community and health services*

*AFC Focus Area #3 – Housing*

- Essential to safety and well-being
- Housing structure, location and choice
- Appropriate housing and access to community and social services
- *Independence and quality of life* of older people

The actual service activities have been carefully planned to achieve the educational objectives of this subject, and to address society needs. Table 1 below highlights the various service activities and deliverables to address the three AFC areas in Box 3 above.

All the service activities have been designed for students to

- Understand the habits and activity patterns of the elderly, and their constraints
- Understand the difficulties in aging in place
- Assess the age-friendliness of Yau Tsim Mong district/ Hong Kong

- Help students the enhance communication skills, cultivate empathy and sense of respect for the elderly

When the subject was first offered in summer, 2013/14, the 50 students had home visits as well as focus study with elderlies in order to develop a holistic understanding on age-friendly issues from both individual and community perspectives. Later on, with preliminary understanding gained from service projects, the subject spun-off into two lecture groups of 60 students each in 2016/17.

In one of the lecture groups, students do home visits to elderlies who are more physically infirm and/ or live alone (or as couple), and take their client on tours which they plan together. Students in this lecture group are looking at the age-friendly city issues at a more individual or personal level, since they have very close interaction with their clients; yet, their scope of understanding may be rather limited.

The other lecture group team up with more active elderlies from community centers to perform focus study, i.e. to look at more problematic spots in their local community. Students in this lecture group would also perform objective and systematic assessment of age-friendliness using indicators adapted from WHO guidelines (World Health Organizations, 2015). Students in this lecture group would be able to look at age-friendly issues from a wider, community perspective, but they have limited opportunities to hear the voices directly from the neediest group of old people who are not so visible in the community setting. Therefore, at the end of the subject, students of both groups come together in the debriefing session to share what they have done and how they perceived the difficulties faced by elder-lies differently.

**Table 1** Teaching and Service Activities

Class		<p>Lectures/ Seminars:</p> <ul style="list-style-type: none"> <li>- Subject introduction, Age-friendly city concepts</li> <li>- Elderly simulation</li> <li>- Elderly in Hong Kong, per-service training</li> <li>- Design standards, data collection methods</li> </ul> <p>Project meetings:</p> <ul style="list-style-type: none"> <li>- Discuss study plan</li> <li>- Project progress and findings</li> <li>- Debriefing/ Reflection on academic learning and personal development</li> </ul> <p>Debriefing:</p> <ul style="list-style-type: none"> <li>- End-of-subject</li> <li>- Reflection and sharing of experience</li> </ul>
Service Components	Home Visits	<p>Activities:</p> <ul style="list-style-type: none"> <li>- Identify areas of improvements (Age- friendly Housing)</li> <li>- Discuss improvement suggestions with clients</li> <li>- Implementation</li> </ul> <p>Deliverables:</p> <ul style="list-style-type: none"> <li>- Improvements in living environment, or improvement plans passed to social worker for follow-up in case of more complex improvement suggestion</li> <li>- Case report</li> </ul>
	Tours	<p>Activities:</p>

		<ul style="list-style-type: none"> <li>- Plan a half-day outing/ tour with home visit client</li> <li>- Examine age-friendliness of transportation and outdoor spaces &amp; buildings during tour</li> </ul> <p>Deliverables:</p> <ul style="list-style-type: none"> <li>- Tour recommendations for elderly</li> <li>- Photos/ Memoir for elderly</li> </ul>
	<p>Age-Friendly City Focus Study</p>	<p>Activities:</p> <ul style="list-style-type: none"> <li>- PolyU students team up with elderlies</li> <li>- Identification of study theme/ problematic spot</li> <li>- Field visits to collect data for problem identification and analysis</li> <li>- Devise improvement suggestions with elderlies</li> <li>- Engagement workshop/ presentations at community centers</li> </ul> <p>Deliverables:</p> <ul style="list-style-type: none"> <li>- Presentation at community center – raise awareness of age-friendly concepts</li> <li>- Report – include study findings, recommendations for improvement and monitoring E.g. sub-mission to district council</li> </ul>
	<p>Age-Friendly City</p>	<p>Activities:</p> <ul style="list-style-type: none"> <li>- Use defined indicators to perform baselines assessment</li> </ul> <p>baseline assessment of age-friendliness using core indicators adapted from WHO guidelines</p>

	Community Assessment	<ul style="list-style-type: none"> <li>- Objective data collected</li> <li>- For evaluation, progress monitoring, setting goals and targets</li> </ul> <p>Deliverables:</p> <ul style="list-style-type: none"> <li>- Data sheets &amp; Assessment report</li> </ul>
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**4 Impacts on Elderlies**

The built environment is one determining element that contributes to active aging, or older people’s quality of life. To put the professional knowledge and skills of the Department of Civil and Environmental Engineering into service, the service activities are focusing on improvements in the built environment. Some of the improvements are immediate (typically the small-scale improvements in living environment), but those in the public realm (outdoor space & building, transportation) takes a long deliberation process before the improvement plans are being realized. By now, it should be apparent on how the service activities are oriented towards the elements of “Housing”, “Outdoor spaces and buildings” and “Transportation” amongst the eight Age-friendly city topic areas highlighted in Fig. 1.

Yet, from the feedbacks collected directly from elderlies, community partner, and observations made during the service projects throughout years, the subject brings about other benefits.

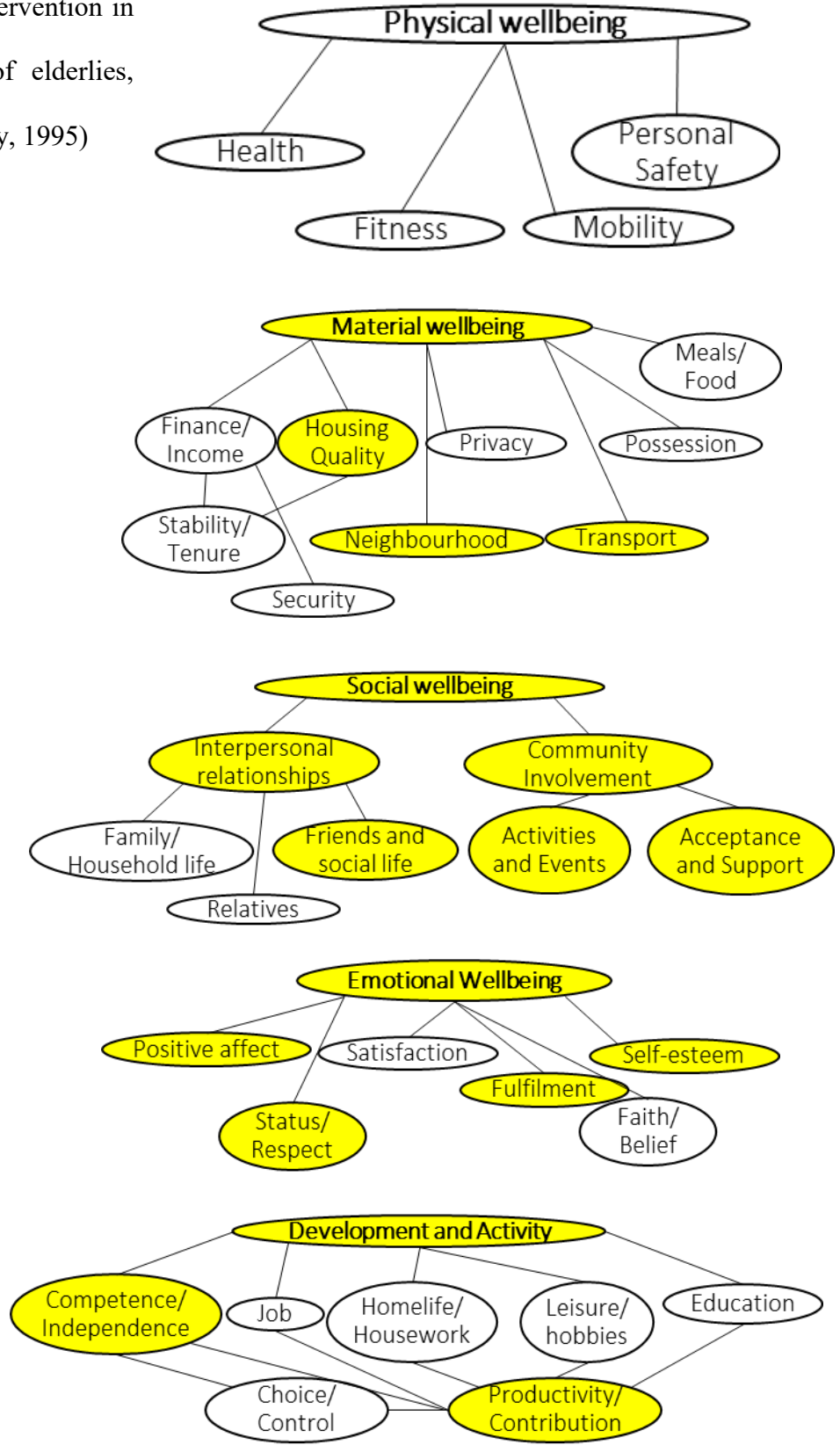
In the Age-friendly City focus study, elderlies work with students as a team to identify problems in their community, devise solution, and prepare presentations at community centers (as engagement activity). Through this collaboration with students, the following outcomes have been observed:

- Increase in competence: Elderlies gained knowledge in age-friendly city, and are more capable of digesting and interpreting quantitative and qualitative information due to the joint field study with students
- Empowerment: With the gain in competence and the platform being set up to follow up the improvement suggestions at district council, elderlies are functioning as change agent; they felt empowered and they are able to make some changes to the community
- Social Participation: Through the engagement talks at community centers, a lot of elderlies who felt passive and pessimistic became eager to express their views towards age-friendly city issues
- Social Acceptance and Respect: apart from elderlies who participated directly in the focus study found acceptance and respect from students and officers at the District Council, elderly participants at the engagement talks realized that their voices are being listened to and accepted.
- Empathy: the close collaboration with students for one semester provided opportunities for elderlies to expand their social network to a group of young people whom are usually not part of their social circle. During the process, they understood the perspectives and values of one another, instead of being very critical about young people, elderlies began to understand and empathize the challenges faced by young people nowadays.

The service projects and the way that the projects are delivered contributed the quality of life of elderlies, the project deliverables (home improvements, proposals on improving age-friendliness of community) are contributing to the “material wellbeing”, while the process which the service project is delivered brings about increase in competence, empowerment etc. as mentioned above contributes to “social wellbeing”, “development” and “emotional wellbeing” of elderlies (Flece & Perry, 1995), these aspects are highlighted in yellow in Fig. 3 below.



**Fig. 3** Service Project intervention in Quality of Life aspects of elderlies, adapted from (Flece & Perry, 1995)



## **5 Impact on Students**

While the overall gains of service learning in PolyU students' learning are contended in Chapter XX, this section discusses more qualitatively the observations in reading students' reflective journals, observations in students' field service. Since students' consent have not been obtained when they submitted their reflective journals, students' works are not directly quoted here. Discussions are going to be made in both positive and negative aspects.

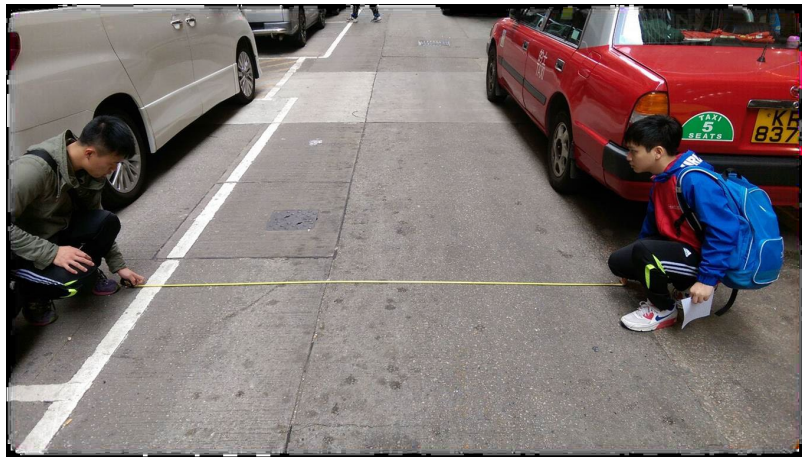
### ***5.1 Independent Learning***

After several introductory lectures on the basic concepts, students looked up other references online, such as design standards in Hong Kong and overseas, or examples of good practices in other countries (such as intersection layout as in Fig. 4, or new technology in tacking uneven pavement surface). In problem identification, they researched what are the appropriate approaches in data collection (e.g. how to evaluate the effects of illegal parking (Fig. 5), which kinds of devices are needed in measuring indoor air quality (Fig. 6). There are some negative examples, such as students did not plan carefully about the field investigation, did not bring any equipment (not even a tape rule) when they are supposed to measure the widths of walkways in a specific task.

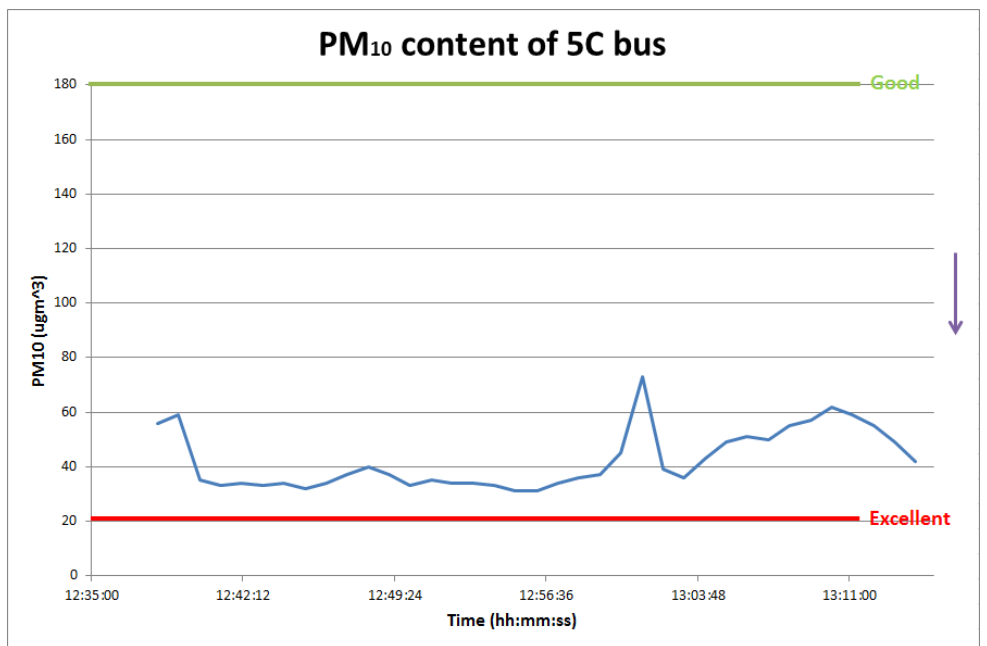
**Fig. 4** Suggestion to Shorten the Distance of Pedestrian Crossing, Example Taken from Tokyo, Japan



**Fig. 5** Students Checking Whether Remaining Width of Carriageway is Wide Enough for Emergency Vehicles



**Fig. 6** Air Quality inside Public Transport Measured by Students against Air Quality Objective



## 5.2 *Problem-solving*

There are a lot of ad hoc problems in project works, in which not every situation can be covered in lectures or they can be warned ahead. Some students were able to identify a good solution while some couldn't.

- For example, students are supposed to plan a half-day tour with their service clients, but some clients later on refused the proposal. Some students tried to look for the reason and convince the client to change their mind, or come up with some alternative activities that are meaningful and less physically demanding, while some just gave up and ask the subject lecturers on how to fulfil the service hours otherwise.
- Another example would be students are supposed to remind their clients of the upcoming home visit on phones. Some student didn't do it, did it too long before, or just half hour before showing up at the doorsteps, these are instances of poor planning. Sometimes, they called several times and couldn't reach their clients and then just gave up. While discussing about this kind of situation in the project meeting, some students admitted that they were not aware of the possibility of this client being alone at home and needed help. However, they felt that they couldn't enter the building anyway because there's a gate. Students could have waited at the gate for someone come out, or explained the situation and asked the guard to accompany them to the home of their client, even policemen or the social worker would have done something similar. This example maybe an indication of students seeing the service activity as a task and they do not care about the client that much, despite it is more likely to be a lack of problem-solving skills and the entire group were not aware of the range of possible reasons and how the problem can be tackled better rather than simply going away.

### 5.3 *Empathy*

Through the service projects, no matter through the close interaction with elderlies in home visits and tours, or in the age-friendly city focus studies, students learnt a lot more about the lives of old people. Some students felt very sorry for elderlies who worked hard for decades, but being exploited by their employers and thus has not much saving, living in very unfavourable conditions (Fig. 7), students started to think about social injustice. When students visited the elderly community centers, they saw discrimination; the staffs there knew the names of the more affluent elderlies who regularly enroll in various classes that require course fees, but did not really welcome other members who just come to pass time, read newspapers and socialize. A group of students from the first cohort, after they finished the subject and went to Shanghai for study tour, they made a long-distance call to remind one of their clients of her upcoming medical appointment. Seeing students moving from focusing on their own grades in this course to showing care for others is also a rewarding experience for teachers. Empathy is not something that would develop very naturally in some students and they needed some reminder in project meetings with subject lecturers.

**Fig. 7** Pictures of Living Environment of Typical Elderly-only Households



#### **5.4 Deep Learning**

The service learning subject has brought students some eye-opening experience, despite most of them are not so pleasant ones, that's what stimulated reflection and deep learning.

- While students were conducting questionnaire survey, they were shocked at many old people are illiterate. It caused some hurdles because students thought they can simply print out the questionnaire and let elderlies finish themselves. Moreover, students found the respondents are quite gloomy, they saw themselves as useless (low self-esteem), being ignored, and thought

that the questionnaire might be scam. These are all something student have never thought of and really moved them while conducting field service.

- In student's field studies, they had a very strong impression that private developers/ facilities operators (especially the high-end ones) purposely do not want elderly to hang around in their premises by removing seats, closing down the escalator etc. These no-too-pleasant encounters often triggered students to think deeper about what could be done. For example, students reflected the conflict between personal interest and social responsibility, or on the housing problems in Hong Kong, seeing how impractical it is for Hong Kong people to live with their parents and what can be done as a professional who are going to build houses.

### ***5.5 Mutual Respect and Understanding***

Before this project, elderlies and young people do not have much chances to interact. They had some impressions derived from mass media or internet. Through service, students changed their views about elderlies, instead of being stubborn and conservative, they can be very well-educated, open-minded. Elderlies often think young people as arrogant and selfish, but they found our students are in fact very caring and respect old people. It is rather interesting to observe students' interaction with elderlies in the subject. In Chinese culture, we were taught to respect the elders, and it is often translated to being submissive. Some students just followed what the elderlies suggested, while some were willing to challenge their views with reasons. As expected, most of the elderlies were grateful to and appreciated what the students have done in the home visits, tours, field visits or preparing presentation at community centers; sometimes they had high expectations on students and were rather critical about students' level of enthusiasm and performance.

## **6 Reflection as Subject Leader**

The above sections qualitatively discussed the subject/ service's impacts on elderlies and students, this section are some reflections as a subject lecturer.

### ***6.1 Adaptation to Experiential Learning***

Service learning is an experiential learning approach in which students' learning comes from their action and reflection. This is very unfamiliar to students and teachers. Students in Hong Kong came from a very examination-oriented system and they are very accustomed to highly-structured, lecture-based learning. Students felt confused and were not comfortable at the beginning of the subject when they were planning what they would do in order to achieve the desired service and learning outcomes, they felt a lack of guidance when given too much freedom to chart their own learning. Despite there is a wide-spread trend of active-learning approaches in higher-education, teaching and learning in science and engineering disciplines remains rather traditional, at least at PolyU. Experiential learning not only caused a cultural shock in students, but subject lecturers as well. Engineering teachers' adaptation to a new teaching and learning style that have not been experienced before in our own education or career is also painstaking. With limited training and support, teachers are also going through an experiential learning process in how to teach a service learning subject: to provide guidance instead of instructions, to facilitate reflections rather than demonstration of technical knowledge, and to assess students' level of achievement in various qualitative criteria rather than awarding marks to right or wrong answer.



## ***6.2 Students' Acceptance in Service Learning***

At PolyU, service learning is a graduation requirement, students only have a choice of which service learning subject to take but not forgoing service learning entirely. In students' reflective journals and debriefing meetings, most students admitted that they do service learning because they do not have a choice, they are not too interested in spending the time and effort in community service, most students started off with a negative feeling about service learning. In time, some students found satisfaction in service, and discovered some learning and changes in perspectives, these students normally demonstrate higher level of engagement and are more proactive in service. Some students, on the other hand, could not shake off the feeling that they are forced to do this, they displayed continuous resistance, felt that the subject and service activities are poorly organized, there is too much work and would like to fulfil the requirements using minimum effort. This group of students lacked engagement throughout and could sometimes jeopardize the teamwork, which required extra mentoring by the subject lecturers.

## ***6.3 Awareness of Social Needs***

Aside of the work, service learning provided an opportunity for faculty members to reflect the relationship between research and community, to help us stay grounded. Expert knowledge in a subject area and research skills can be directly applied in service through student. One example would be, students and elderlies involved in the project (or the community in general) are looking for improvements in walking environment, they can all subjectively tell what is good and what is not so good, but they need help from faculty members in identifying what are the defining elements of walking environment to facilitate objective data collection and analysis. Another example would be, in community meetings or focus group interviews, elderlies might have expressed a lot of views,

but with proper data transcription and qualitative analysis technique, further insights could be generated.

Through engaging in service activities with students, faculty members can see the deficiencies in existing standards, guidelines and policy; just to list two examples: (1) in the current town planning standard (Planning Department, Hong Kong Special Administrative Region Government, 2016), the population-based provision of recreational facilities encompasses active sports like badminton, squash, swimming, football, but there's no explicit standard provision of exercise facilities for elderly; (2) in transport planning guidelines (Transport Department, Hong Kong Special Administrative Region Government, 2013), it assumed pedestrian walking speed as 1.2m/s in traffic signal calculation, and stated that engineers might consider using a walking speed of 0.9m/s in case of high portion of elderly users, there's no additional consideration or guidelines on traffic signal design in view of aging population. The service experienced allowed faculty members to voice out observation when they are being consulted as experts in government committees.

#### **6.4 Challenges**

Teaching service learning subject can be a rewarding experience when we see the students showing high level of engagement and self-initiative, reflecting on own's room of improvements, and observing their change in attitude or perceptions. Moreover, the project setting allowed students to demonstrate their creativity and talents that often surprised the teachers. Yet, there are other challenges associated with the delivery of service learning courses.

#### **6.4.1 From Passionate to Burn-out**

The first thing would be the workload. Service learning subjects are usually delivered in form of small group projects, regular field supervision and debriefing/ meetings with students are essential to ensure quality of service as well as students' learning. Each service session are typically 3 to 4 hours and off-campus. This lead to timetabling problems with students and tremendous amount of coordination work compared with a typical lecture-based subject. As a result, service activities are often scheduled in evenings and weekends. The extra work in coordination and also work outside normal hours often cannot be completely recognized in the University's framework. Service learning teachers are passionate about what they are doing, find satisfaction and sense of fulfilment in seeing students' growth and doing good to the community. However, when consistently high workload and pressure over semesters eventually go beyond the tipping point, and there begin feelings of burn out, low morale and resistance. This introduces extra difficulties in subject coordination.

#### **6.4.2 Coordination among Subject Team**

Due to the small group project nature of the subject, a much higher student-staff ratio is needed, it means the subject is often delivered in a subject team. When the subject team is getting large, coordination among lecturers would be necessary to ensure consistency. Most faculty members used to work independently with high level of autonomy are now required to communicate a shared vision or work according to something he/ she might not totally agree to, and it leads to pressure or even conflicts among colleagues. Coordination among colleague is often much taxing than the workload itself, and it is even more so when some team members felt overloaded with the service learning subject.

## 7 Conclusion

This service learning subject has been an experiential process for both students and teachers. The subject has been designed for students to gain subject knowledge, develop professional skills, awareness of social problems, empathy to people in need, and personal development. These learning outcomes are realized through service projects that target certain community needs. The subject framework has been defined in a flexible way to accommodate different community needs. In view of the trend of aging population in Hong Kong and the relationship between built environment and quality of life of older people, this subject has been focusing on the theme of age-friendly city since its first offering in 2013/14. Throughout years, there has been organic growth in the subject with increased class size, more diverse and in-depth service activities. Looking back, the subject has made positive contribution to the service clients (elderlies) through improvement in the physical environment, and enhancement in other aspects that contributes to their quality of life, such as respect, acceptance, social participation, empowerment, and fulfilment. To students, this service learning experience effectively fostered independent learning and problem-solving. Students are being introduced to a social group whom they are not familiar with, and developed semester-long relationship with the same group of service recipients; from this, students truly understand and appreciate the complexity of the problems (not limited to age-friendly issues) faced by elderlies and developed empathy based on these relationships. Not only forming bonds with new people, often students encountered things that are out of their expectation in service, and these new experiences provoked deep reflection. Service learning teachers are passionate in teaching, found great satisfaction and sense of fulfilment in witnessing students' growth, change in attitude, and doing good to the community. The experiential learning approach has been a new thing to both students and teachers which required adjustments, thus, there are development in teachers while

engaging in the subject. Teachers are overwhelmed by the workload due to group-based field work, and subject coordination among the teaching team is challenging as faculty members used to enjoy high autonomy in teaching and research. The engagement in service activities with students provided faculty members with opportunities to reflect on the relationship between research and community, to keep us grounded. This service learning subject acted as a conduit for us to apply our expert knowledge and research skills in service, and to advise government on setting of policies, guidelines and standards.

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