Metropolitan Universities Journal

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Engaging Communities in East Asia

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Service-Learning in Asia

Carol Ma Hok Ka, Thera Chiu, and Lim Tai Wei

Service-Learning

Service-learning (SL) has been recognized as a pedagogy that integrates meaningful community service with academic knowledge and skill development. It is an instructional practice providing a self-reflection platform for different stakeholders to enrich their learning experience, nurture civic responsibility, and strengthen community bonding (Ma, Chan, Mak, Chan, 2018). Globally, higher education institutions (HEI) are integrating SL into their curriculums as significant studies have shown the benefits of this innovative approach to experiential learning (Ma & Lo, 2016; Kiely, 2005), including enhanced academic learning, communication skills, organizational skills, problem-solving skills, social competence, research skills and civic orientation (Ma & Chan, 2013; Astin, Vogelgesang, Ikeda, & Yee, 2000; Vogelgesang & Astin, 2002). It has also generated new knowledge (Hargreaves, 2003), improved leadership skills (Snell, Chan, & Ma, 2013), and encouraged civic engagement (Steinberg, Hatcher, & Bringle, 2011).

Service-Learning in Asia

Although SL is primarily a western learning concept, it is widely used as a pedagogy among education and community sectors in Asia, especially after the academic conference on 'Service-Learning in Asia: Creating networks and curriculum in higher education' held in 2002 at the International Christian University (ICU) in Japan as this became an interconnection with other Asian HEIs (Xing & Ma, 2010). In 2004, ICU set up the Service-Learning Asia Network (SLAN) with support from the Japanese Government and the United Board for Christian Higher Education in Asia (Ma, Chan, Chen and Fong, 2018). In 2004, LU received one million dollars (HKD) funding support from Kwan Fong Charitable Organization to start a Service-Learning and Research Scheme (SLRS) and then in 2006, received another ten million dollars (HKD) to set up the first Office of Service-Learning (OSL) in Hong Kong. With the aim of constructing a model for academy-student-community partnership, LU has made an attempt to truly put the inspirational slogan "Serving to Learn and Learning to Serve" into practice. With commitment from a dedicated SL team and support from local and regional partners, LU started taking the lead of SL development in both Hong Kong and Asia. LU even organized the first Asia-Pacific Regional Conference on Service-Learning (APRCSL) in 2007 and served as the secretariat for SLAN after the revitalization.

The biannual APRCSL was established in 2007 as a platform for education institutions and non-profit organization in the Asia-Pacific region to share knowledge and experiences in SL. After a few years of conference, it is also found that Asian countries explore different ways to understand the meanings and the practices of SL. They also realized the unprecedented need

to modify and adjust to this concept with their own cultures, social and political characteristics.

The themes of the APRCSL are listed below:

- 2007: An Evolving Integration of Theory and Practice
- 2009: Crossing Borders, Making Connections: Service-Learning in Diverse Communities
- 2011: Make a Difference: Impacts of Service-Learning
- 2013: Service-Learning as a Bridge from Local to Global: Connected World, Connected Future
- 2015: Love Journey: Community Engagement through Service-Learning
- 2017: Educating the Heart: Nurturing a Fruitful Life Through Service-Learning

In 2019, the 7th APRCSL hosted by Singapore University of Social Sciences (SUSS) with the support of the Service-Learning Asia Network and different key partners include Lingnan Foundation, SG Cares, Youth Corps Singapore and SkillsFuture SG. The conference theme was 'Service-Learning: A Lifelong Journey of Social Responsibility'. As the organizer and the secretariat of the SLAN, SUSS noticed increasing societal and environmental challenges, the need to influence and empower Asian youths to actively develop and act on their sense of social responsibility is ever pressing. In both academic and co-curricular applications, SL could play a critical role in HEIs in educating and engaging our youths to develop the knowledge and skills (Head), attitudes and dispositions (Heart) to make life choices that are socially responsible (Habit), in their journey of growth to become leaders in society. Since the whole region is facing similar social problems like poverty gap, ageing population, global warming, energy shortage and food crisis, environmental issue. SL provides a very good platform for students to take action beyond the campus environment, visualize the world as their home and become social leaders to spread love, care and act for the good of people in need.

Articles in this Issue

Lu, Chen and Yang took a group of Macau students out of their comfort zone and went to the mountain area of China to experience the life of ethnic minority children through a SL teaching project. The authors have shown the real life experiences to the students, thus, the students had more understanding of poverty issues and education opportunities in China's rural areas. Through the SL project, students also developed their teamwork spirits, leadership and service skills. And the most important is they have commitment to continue to serve because they understand SL must be a mutual process. The SL experience not only empowered the students, but also let them understand how a living-learning community can be created to educate people holistically.

Living-learning community can happen anytime if we show respect to each other, for example, intergenerational learning. In view of the ageing population, especially, the increasing longevity and persisting low fertility have given rise to the whole ageing population in the world, there is a demand to promote more intergenerational harmony. Au Yeung, Lam and Fong shared how they have created a learning platform for young-old work together in a Science course. The authors tried to explore how elderly individuals participating in a SL project facilitates open communication and reciprocal learning between age groups, and promotes intergenerational harmony. The young old partnership in the SL project has not only enhanced the trust and communication, but also help to promote a sustainable society. Their findings echoed to what Chan et al (2013)'s research result that 'Through learning, investigating, communicating and solving problems together, students and elders cooperate and complete the learning journey hand in hand." It is a positive experience while young-old work together.

However, not every SL project can run it smoothly. There are still substantial challenges (e.g. recognition of faculty and students' involvement in SL; sustainability issues, ethical conduct of SL, etc. have not been sought for approval/cooperation with school authorities) to conduct SL in the region. Uy's article is an example to talk about the enablers and barriers in implementing SL in the context of a premier private Catholic Philippine allied health profession education institution. She also highlighted the multi-dimensional perspectives from the academic community of faculty members, students and the partner communities regarding many key concepts which may affect the SL implementation. While the benefits of SL are clear to the academic landscape, it was apparently not adequate to drive its successful implementation to attain its graduate outcomes as well as the resultant disability-related health outcomes for the communities we serve. The results of her study can inform development of continuing education, training and support for considering SL as its signature pedagogy in the allied health profession. She re-emphasized that SL can potentially support allied health profession curriculum for its emerging professional identity and role in enhancing disability-related health outcomes.

Other than integrate SL into your curriculum, you can also use SL as a way of conducting a community engaged research. Loan and Hsu tried to explore how civic media practice facilitating the democratic process in environmental protection in Taiwan through community engaged research. The authors conducted in-depth interviews and analyzed the posts on Facebook group, LINE messages, and websites of two ongoing projects regarding the impact of civic media practice on the democratic process. They also analyzed how social networking sites or applications function in four activities of the democratic process through network building, discussion forums, distributed ownership and persistent input. These activities definitely help organizations overcome distrust of institutions and enhance civic media's ability to foster connections and create more usable interfaces between communities and institutions. Nevertheless, creating a good space for discussion where people can voice their concerns is necessary, however, how to create a transparent, open and fair space between the participants and the administers are always a question? So, research may help to suggest what

would be the best to provide a safe environment to express views and concerns. And it may also mitigate the harm to democratic processes as well.

Conclusion

Though SL has been spreading in the region, there are not enough discussions on how can SL enhance teaching and learning to serve the needy in the society. The articles in this issue are some examples in the region, other challenges and opportunities should be shared in order to create the best practices for the region. In 2017, a presidential meeting of SLAN was held to discuss the development and best practices of SL in the region. It was confirmed that Silliman University in Philippines and Dongseo University in Korea will host the next regional conferences in 2021 and 2023 respectively. Looking ahead, it is important to develop more joint partnerships and platforms to highlight the importance of SL as it will definitely be one of the means to address disruptions in the contemporary world and complex social issues. As you read this issue, we hope that you can consider the following questions: What are the needs in the region? Ageing issues? Environmental issues? Democracy? Children education or other else? What make SL work? How can we support SL movement? And what and how the HEIs recognize faculty members and students to embrace SL? Hopefully, with your reflection, we can get more insights from you in the next regional conference in 2021 in Philippines.

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Introductory Service-Learning Experience: Macau College Students in Ethnic Minority School of Mountain Area in China

Lu Ching Hui, Chen Zi Yan, Yang Zi Yi

Abstract

This paper described how university students from Macau took social responsibility in China through Service-Learning project. It was an introductory experience for the student participants and for the children in the mountain area as well. This study aimed at raising children's interest in learning and their desire of continuing study. Results were reported in four themes: (1) increasing personal competence of teamwork spirits, leadership and service skills; (2) students' perception towards poverty issue and education in China rural and mountain areas; (3) having commitment to the next service; (4) realizing that Service-Learning must be a mutual process. This paper also provides an overview of how a living-learning community dedicated itself to community service to educate residents holistically.

Keywords: service-learning, poor alleviation, education, residential college

Introduction

In 2018, the Macau Special Administrative Region (SAR) Government was committed to following the Central Government's policy of precision poverty alleviation in Congjiang, Guizhou Province (Coutinho, 2018). In July 2018, Cheng Yu Tung College of University of Macau (CUM), as a living-learning community and a leading university in Macau, conducted an investigation to understand their needs. After meeting with local government officials and school principals, the College launched its very first Service-Learning program in December 2018, to provide volunteers to teach Mandarin, music, physical education and arts courses at one targeted school.

"D" Primary School was located in the mountainous area and people were from a Chinese ethnic minority-Miao. Most villagers were illiterate and few spoke the Mandarin language at work or at home. Since China's reform and liberalization, only two residents had earned high school diplomas in a village of two thousand people. In the face of scarce educational resources, "D" Primary School's learning environment offered only kindergarten, first grade, and second grade. Children were reluctant to attend third grade schooling in other villages due to low learning motivation, transportation difficulties, or their parents' orders. This project aimed at raising interest in learning for sixty-seven second-grade children, and motivating them to further their education. At the same time, it was a first-time service experience for most of the Macau students. In the end, it showed that thirteen students from the College students developed a greater social responsibility to motherland China, in response to Macau SAR government policy.

Literature Review

Macau SAR's Policy of Poverty Alleviation in Guizhou

On May 23, 2018, Chui Sai On, Chief Executive of the Macau Special Administrative Region (SAR) Government, and Zheng Xiaosong, Director of the Liaison Office of the Central People's Government in the Macau SAR, led a delegation to Guizhou Province. Together, they signed a "Poverty Alleviation Cooperation Framework Agreement" with Guizhou's Provincial Government to launch a jointly administered poverty alleviation program. Macau SAR agreed to further cooperation between Guizhou and Macau in five areas: (a) tourism; (b) commerce; (c) education; (d) agriculture; and (e) informatization (i.e., make the local economy and society more information-based).

Furthermore, Macau SAR Government would provide focused assistance to Congjiang County through "precise poverty alleviation work", in eight areas: "industry, tourism, culture affairs, education, healthcare, talent development, employment transfer, and donation" (Zhao, 2018). Moreover, the Chief Executive stressed the SAR Government would strive to encourage further participation from the Macau community to reduce poverty in Guizhou. In addition, according to the agreement, the Macau SAR Government allocated funds not exceeding 30 million renminbi to support rebuilding a primary school campus in Congjiang County. This "D" Primary School is the target of this study.

Miao People and "D" Village Community

"D" village's population was mainly composed of one Chinese ethnic minority, the Miao. The village was located on a high slope, transportation access was difficult, and communication was not easy. Most of the villagers spoke Miao instead of Mandarin. The Miao people are the fifth largest ethnic minority in Mainland China (Han are the majority). Miao people had their own religions and complex customs. In order to protect Miao's bloodline, Miao have strong traditions that prompt them to stay in close-knit, communities, regardless of living in harsh conditions for thousands of years in rural and mountainous areas (Yang & Zhao, 2013).

The "D" villagers still lived a very traditional farming life. "D" village had a total of two thousand people, and as of 2018, three hundred and forty-six people still lived in households defined as poverty-stricken. "D" Primary School was located in the center of "D" Village, twenty-six kilometers away from the closest city. It had two hundred and sixteen students in one kindergarten, three first-grade classes, and two classes of second-graders. Nine teachers worked there, and only one possessed an undergraduate degree. Due to its mountainous location, "D" Primary School and its village regularly face a water shortage for two to three months out of every year, and they struggled to provide clean drinking water.

Residential Colleges of University of Macau and Cheng Yu Tung College

University of Macau implemented its Residential College system after relocating to its new campus in 2014. As of today, it has established ten living-learning residential colleges. The objective of the University of Macau's whole-person education model was to nurture self-reflective, caring, and socially responsible individuals who can grow in a challenging and multicultural environment (Chen H. D & Gong H, 2016). To achieve this objective, Cheng Yu Tung College organized several programs with the goals to encourage students to practice what they learn in class and contribute to the community, and transforming them into global citizens with sense of responsibility and patriotism.

Service Learning and Citizenship

The College designed the project based on a modified version of Fertman, White and White's model (1996). The model comprised four phases, entitled preparation, service, reflection and celebration. In the preparation phase, the team had to understand "D" Primary School and its students' backgrounds, obtain the school's support and establish Service-Learning goals, providing College volunteers with teacher training. In the service phase, the team moved from exploration to understanding and from a group mode to a mindset of caring for each individual student. In the reflection phase, the team performed group and individual reflection, from *What* (what I did), *So What* (what I learned), *Now What* (what I do with what I learned). In the celebration phase, the team demonstrated the teaching outcomes to parents, the community and the college (Jacoby, B., 1996).

The model's authors believed that students acquire knowledge more quickly when solving practical problems, while service learning provides such an environment. College students strove to communicate with Miao children who did not speak Mandarin fluently. The children's behavior and the College students' reflection amply demonstrated service learning's theoretical claim of "service, combined with learning, adding value to each and transforming both" (Eyler, J& Giles, D.E, 1999). Furthermore, service learning provided an ideal environment for bringing together disparate qualities of values, knowledge, skills, efficacy and commitment into effective citizenship development. Students first feel a sense of social responsibility and then acknowledge the importance of social justice. Students find the motivation to do more, by looking at their results and seeking ways to improve them. In trying to make a more effective difference, they may revise their strategies or even take some risks, by which they gain experience and self-confidence. Service learning has the capacity to develop students who felt connected to community to commit themselves to engaging in the next service. To sum up, participation in service learning led to the values, knowledge, skills, efficacy, and commitment that underlay effective citizenship (Eyler, J & Giles, D.E 1999).

Service Leaning in China

Since the implementation of reform and opening-up, China has witnessed many groundbreaking changes within its culture, economy, and education. The country makes rapid

gains in digitalization, globalization, and economic development. In today's ever-changing society, new opportunities and challenges constantly emerge. As a result, people struggled with the difficulty of meeting the high demands of this rapidly evolving environment. (Ma, Chan, Liu & Fong, 2018). By a continuous improvement in education levels, more and more institutions, including high schools and universities in China, began to nurture students with multiple skills, abilities and sense of social responsibility to adapt to this changing world. For instance, in 2001, China promoted the Volunteer Service Act, classifying voluntary service as a means for fulfilling civic duty.

Chinese government and institutions acknowledged that education should go beyond to classroom instruction. More importantly, students ought to join society and apply what they have learned to practice and contribute to society. After all, theory and application were complementary and mutually enforcing. However, compared to other regions or countries in Asia such as Hong Kong, Taiwan, Singapore, Philippines, etc., service-learning projects for credit or in a formal class setting were still not common in Chinese higher education. (Guan & Xiong, 2011).

Project Design and Student Participants

The College designed this service-learning experience with residential college students in mind. Out of thirteen participants, five were male and eight were female. Most were from academic disciplines other than teaching primary school. Only one student had prior experience doing volunteer service while at university. It was a non-credit, living-learning project taught by a College Resident Fellow, faculty members, non-government organization personnel, as well as university students from Congjiang, Guizhou. The project included sixteen hours of classroom instruction and preparation, twenty-four hours of community service, and six hours devoted to evaluation.

Teaching Approach

In the service process, a "communicative approach" informed a small group discussion. This study divided sixty-seven students into twelve groups and a teaching assistant took charge of each group. While one student instructor was in the front teaching, other teaching assistants made sure the children knew what to do and responded correctly. The teaching method trained children's ability in three aspects: linguistic competence (its grammar and vocabulary), sociolinguistic competence (how to use and respond to language appropriately) and strategic competence (recognize and repair communication breakdowns before, during, or after they occur) (Richards & Rodgers, 2001). Additionally, students learned a variety of teaching aids and many interesting activities as another teaching approach. The teaching aids were diverse to arouse different children's attention and interest. For example, children would play clarinet, use the labyrinth to practice mandarin, or have time for creative painting. With the mentoring and supervision of teaching assistants and student instructors, children had the opportunity to receive responsive care and attention. The project was student-centered, especially for those children who were shy or unable to use Mandarin to express themselves.

Study Evaluation

This study used a qualitative description method to collect and analyze data. The authors collected data by several means, including verbal presentation of student reflections in personal meetings, students' written journal reflections, instructor's observations, and the partner institution's feedback. In their analysis of teaching results, the authors interviewed the school principal and some Primary School student representatives to evaluate this project.

Journal reflection covered topics such as the meaning of service learning, poverty alleviation, policy-making, the educational system, a sense of social responsibility and personal growth such as teamwork spirits, cultural engagement, and service and leadership skills. The authors coded all this data to develop a number of meaningful conceptual units. Two researchers codified separately, and subsequently compared each other's categorizations.

Results and Discussion

Four major themes were identified as students undertook the project: (a) increasing personal competence of teamwork spirits, leadership and service skills; (b) college students' perception towards poverty issue and education in China rural and mountain areas; (c) fostering the sense of commitment and social responsibility; and (d) it was a mutually beneficial learning process.

Increased Team Spirit, Personal Competence, Leadership, and Service Skills

The training helped the volunteers understand the Miao's ethnic minority culture, find the meaning of service learning, and discover how to communicate with one another. This introductory service experience improved their team spirit and ability in all phases. Volunteers also gained a greater appreciation of leadership and service:

> This Service-Learning journey was my happiest journey, and my working group was very united and attentive. From the preparation to the on-site teaching, everyone contributed his or her time and ideas selflessly. If we had any disagreement, we would listen, discuss and analyze it carefully in order to develop a more appropriate teaching plan for the children. (#4)
>
> We had to teach in front of the classroom. We needed to instruct our teammates and the kids. Then we would become teaching assistants in turn. This made each of us a leader and a good follower. (#5)
>
> I am grateful that we had each other. We learned how to lead out of love and service. " (#10)

> At the beginning, I thought being the instructor in the front of the classroom would be the most exhausting job, but after the first day, I found that being the teaching assistant with children was the hardest. After that, I realized the importance of teamwork: we had to work closely. It was necessary to communicate with each child, making sure they understand what the instructor meant. I also had to learn to how to manage time and allocate some tasks for the children in order to achieve the purpose of each lesson." (#12)

College Students' Perception towards Poverty Issue and Education in China Rural and Mountain Areas

College students saw firsthand the link between poverty and poor quality education. As mentioned above, out of nine teachers in "D" Primary School, only one had a bachelor's degree. Compared with advanced countries in Asia or elsewhere, the standard for teachers here is still low (National Institute of Education Science, 2010) and it influences the teachers' attitude to their children's education. A lax attitude made teaching harder and it is quite difficult for college students to communicate with the school equally. Poverty alleviation must have both economic and humanitarian aspects.

> Everyone has the right to get an education. Equipping our mind and brain makes us stronger and that is when we will not need poverty alleviation support. We walk ourselves out of poverty! (#2).

> It is a very good to see that Macau SAR Government tried to support educational affairs. I think that cultivating the young generation will help the most in the long run. It is also crucial for the local teachers to learn more and do more for their own students (#4).

> I think the kids should get more education, not only to get rid of poverty but also be more rigorously prepared to protect their own precious culture!" (#9).

> I think another way to alleviate poverty is to set up a team of teachers to train the teachers in this rural and mountain area of China. Only when the teachers improve can our children be educated out of poverty faster. (#3)

Fostering a Sense of Commitment and Social Responsibility

Children's ability of speaking Mandarin and desire of learning was better than expected. By taking care of every student in small groups, they were willing to communicate in Mandarin. The "D" school did not provide formal classes in arts, physical education and music until the College team came. Children proudly and happily asked their parents to join the celebration party. The principal highly praised the team's contribution and hoped they would come again.

Furthermore, in last July's investigation, the school paid more attention to teaching subjects, but overlooked the personal hygiene or moral education of the village children. The project found that children in mountainous areas had serious illnesses in winter, made worse by the persistent water shortage. Moreover, children did not maintain an orderly classroom. They pushed each other and walked around during the meal. Plainly, their etiquette needed to improve. Above all, the team members felt fulfilled but encountered new tasks and challenges, leaving them feeling obligated to do more. It was encouraging to see nine out of the thirteen participants commit to do the service again.

> You found you had some impact on other people, the kids, the teammates… from their reaction you started to think more about yourself. This was a powerful and meaningful experience" (#11)

> I spent lots of time wondering if it was meaningful to do this service. Then I realized children might not grow that fast, they might not learn that much from me. However, I am sure they were happy and felt the warmth of the larger society. They are loved. If we have more people get involved, it will be a big success! (#8)

> Service learning may be more difficult than expected, but if we chose to join, we should do it with heart for that we may affect other person's life forever. No matter how difficult the road is, we must be unremitting." (#3)

Service Learning Was a Mutually Beneficial Learning Process

College students and "D" Primary School realized that service learning was a two-way, reciprocal process. Unlike traditional volunteer projects or charity actions, service-learning programs contained designed learning plans, thorough preparation, structured reflection and concluding celebration. While providing services to the outside world, College students learned from the children. The meeting of different life experiences made students understand the importance of understanding and respect more clearly.

In the teaching process, the team found out some parts of "Curriculum Guidelines for Primary Schools in Mainland China", the basic skills that students should master in each grade, were missing in "D" Primary School. For example, art class required the mastery of creating and handcrafting. Local teachers in "D" Primary School were not qualified art teachers and with the lack of teaching materials and resources, they did not know how to conduct art classes in a scientific and systematic way. Therefore, the team taught from the RGB color model and then moved to teach how to make paint the Beijing opera facial masks and do the hand- made windmills. Teachers in the "D" Primary School had the chance to learn and continued to use the teaching materials after the team left and as well as the PE courses and Music courses.

> Studying together was a wonderful moment. I like their childlike innocence, which was the beautiful nature of children and what I had been looking for a long time." (#7)

> When we were coaching children one by one, I realized that everyone, no matter at what age or in what kind of environment they grew up, they wanted strongly to be taken seriously. I have learned to understand others better and to consider from their perspectives which also increased my empathy during my very first time Service-Learning experience." (#8)
>
> I quite agreed with the sentence, 'during the service, what we learn might be always greater than what we served'. We went into minority villages, experiencing different life styles and learned different cultures. I have learned a lot and I did hope the children too. " (#6)

Conclusion

This study provided an overview of how university students from Macau took social responsibility in ethnic minority school of mountain area in China through Service-Learning project. The main purpose of this Service-Learning project was to enhance children's interest in learning so they were willing to continue to study. The project achieved these goals. Children showed interest in learning and they actively participated in class activities. Children asked their parents to school to witness their learning outcomes, and reinforced their willingness to pursue more education. Macau College students showed improved team spirit, leadership and service skills. They felt connected to the community and two-thirds of them made a commitment to doing the service again next year. The institution acknowledged their students' effort and enthusiasm. Though it was a first-time service-learning experience for both the College students and the school, it showed that both communities benefited and learned a lot.

Nevertheless, the study had its own limitations. The project took place during the Christmas holidays. The team only had three days to do its teaching. It was not easy to provide a more complete and thorough learning experience for children even though the communicative teaching approach worked excellently. On the other hand, while the team focused on the children's immediate learning interests, better training for local teachers in "D" school is of crucial importance as well. This service-learning project will take place again. In the second project, planners should extend greater consideration to training for the teaching staff, and the children's personal hygiene and manners.

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How Service-Learning Promotes Intergenerational Harmony: A Case Study Of a Service-Learning Project in a Science Course

Sze Nga Cecilia Au Yeung, Lai Ki. Lam, and Jonathan J. Fong

Abstract

The Office of Service Learning and Science Unit at Lingnan University partnered with the Discovery and Education Department at Ocean Park (an aquatic theme park in Hong Kong) to develop a service learning project. Beyond service learning's traditional goals (enhanced student learning, useful service for a community partner), we examined the potential to develop intergenerational harmony. A service-learning project is a compulsory part of the science course CLD9008 Life Sciences: The Way Life Works, taught by Professor Jonathan Fong, Assistant Professor in the Lingnan University Science Unit. This course brings together traditional university students and elderly students from Lingnan University Elderly Academy Program directed by the Lingnan Institute of Further Education (LIFE). The elders are Hong Kong citizens aged 55 or above who voluntarily attend lectures and lessons with the students. In their service-learning project, they join intergenerational teams to transmit their new knowledge and educate Ocean Park visitors. The educational services (narration services at exhibits and assistance with interactive games) aim to fulfil Ocean Park's goal of enriching visitor experience, as well as promote awareness of marine conservation and sustainability. This study looks at on how including elders in a service-learning project facilitates open communication and reciprocal learning between age groups, and promotes intergenerational harmony. The authors wish to express their appreciation to Alan Wong and Orlando Chan from Ocean Park, Hong Kong for supporting this study.

Keywords: service learning, intergenerational harmony, open communication, reciprocal learning, science education

Theoretical Framework and Literature Review

Current scholarship affirms that service learning is an effective means to fostering reciprocal learning and communication between socially separated populations. Intergenerational harmony, in which multiple generations understand and support each other, thrives best by open communication and reciprocal learning between older and younger generations (Storm & Storm, 2011; Dantzer et al., 2012). Intergenerational communication and reciprocal learning facilitate the transmission of traditional values and promote the sustainable development of the society (Kaplan et al., 1998; Wangyal, 2001).

However, studies also identify obstacles emerging from both age groups. Students often have strong stereotypes about the elderly (Pecchioni et al., 2004) and the elderly frequently overestimate their willingness to talk with and learn from students (Beckert, 2007). These mindsets decrease communication and hinder reciprocal learning between older and younger generations (Storm & Storm, 2011). Service learning allows students to render a service towards a particular social need and to reflect on their personal experience through journal writing and classroom discussion (Markus et al., 1993; Westacott & Hegeman, 1996; Bringle & Hatcher, 1996; Eyler, et al., 1997). Intergenerational service learning includes participants of different age groups. It connects elders and university students, and contributes to meaningful exchanges of knowledge and values (Santini et al., 2018; Hegeman et al., 2002; Nicolas, 2001; Knapp & Stubblefield, 2000; Lowen, 1996). When elders and students interact during intergenerational service-learning projects, reciprocal learning allows all participants to be learners and teachers free of hierarchy (Hwang et al., 2014). The ultimate goal is for elders and university students to benefit educationally and socially, in the hope of changing students' stereotypes of elders and elders' unwillingness to learn from younger students (Gutheil et al., 2006; Duke et al., 2009; Lowe & Medina, 2010).

To be successful, intergenerational Service learning should include organized, ongoing, and mutually rewarding interactions between older and younger generations (Newman & Smith, 1997). Most intergenerational service-learning projects cast elders as service recipients and students as service providers, and focus only on student outcomes. Studies focusing on youth providing community service to the elderly far outnumber studies of aged adults as volunteers (June & Andreoletti, 2018; Shea, 2017). In our study, we changed the approach to see how well elders and students work together as service providers. The outcomes and effects on both students and elders derived from two research questions:

(1) Were university students and the elderly more knowledgeable about each other after an intergenerational service-learning experience?
(2) Did the project benefit both university students and the elderly? If so, what had changed?

In this study, we examined whether an intergenerational service-learning project, with elders and students working together as service providers, promotes intergenerational harmony through reciprocal learning and open communication. We evaluated the impacts on both elderly and students through a questionnaire adopting a paradigm for intergenerational learning (Strom & Strom, 2011).

Methods

We researched this intergenerational service-learning project over two periods: the summer semester of 2018 and the regular semester of the 2018–2019 academic year. The services provided were narration of aquatic exhibits and interactive games for Ocean Park visitors. Participants formed intergenerational groups of one to two elderly and two to four university students. The summer semester had twelve participants (six students and six elders), while the regular semester had forty-five participants (thirty-five students and ten elders). As one of its graduation requirements, Lingnan University requires a service-learning project of at least thirty hours' duration. We divided this time between four major components. First, Ocean Park offered a 7-hour training session. In this training, participants learned about Ocean Park, the service activity (narration service and interactive games), and customer service techniques. Second, each group conducted a total of twenty service hours at Ocean Park within an eight-week period dictated by the academic calendar. Third, a one-hour consultation session was conducted in the halfway through the period to discuss experiences and ways to improve. The last component was a 2-hour reflection session, which served as a wrap-up of the service project.

We used a mixed method for collecting data, combining quantitative and qualitative approaches. Quantitative data measured changes in participants' attitude. Qualitative data provided a deeper understanding of how attitude changed and in what way (Johnson & Christensen, 2013). For the quantitative piece, we used pre- and post-test questionnaires to evaluate participant expectations before and after their service. The pre-test consisted of five questions on a five-point Likert scale and one open-ended question, while the post-test consisted of thirteen questions on a five-point Likert scale and one open-ended question. For the qualitative component, we used four ways to evaluate the effect of the service-learning project on elders and university students: observation of their on-site performance and group interaction, observation of midterm consultations, observation of the final reflection session, and study of the reflective essays detailing their experience.

Results

Participant Characteristics and Data Collection Details

The mean age of the elders was 63.4 years. Most (77%) of them were retired. The mean age of the students was 20.4 years. Seventy-five percent of students had no previous service-learning experience and ninety-three percent did not live with their grandparents. Forty participants (66% response rate) completed the pre-test questionnaire, while forty-five participants (75% response rate) completed the post-test questionnaire. We collected forty-four reflective essays from elders and students. We edited the quotes used in this paper for clarity, while preserving the meaning.

Attitudes Recorded Before the Service-learning Project

Participants' qualitative comments detailed participant expectations. Typical elder responses were: "To let me understand more about the students' thoughts, at the same time to share my own experience with them" and "Exchange different ideas between students and elders."

For university students, typical replies were to "Deal with each other peacefully," "I hope to communicate with the elders and other students to gain some more different kinds of insights and experience" and "Have fun and communicate with them [the elderly] comfortably".

Changes in Attitudes Following the Service-Learning Project

Responses to our questionnaires indicated that the project made a positive impact to both the university students and elders. It softened student stereotypes towards the elderly, strengthened intergenerational communication, increased participants' enthusiasm for reciprocal learning, and construction of a positive relationship between elders and students.

Changed students' stereotypes towards elderly

One of the questions on the pre- and post-test asked the participant their comfort level when speaking with the other age group (Table 1, Question 1). For the elderly, the mean score increased from 3.90 to 4.67 (maximum 5), while for university students, the mean score increased from 4.23 to 4.36. In the reflective essay, many university students described their changing perceptions towards the elders. In this service-learning project, elders were not the service recipient, but rather they worked closely with the students as the service provider. Through this cooperation, many university students claimed they changed their stereotypes of the elderly. The following student excerpts illustrate these changes:

> In the beginning, we thought that he (elderly team-mate) was not capable of doing many things since he was older than us. However, in truth, he is very smart and tough.
>
> I thought there would be a generation gap so that we may not communicate well. But after the service learning I feel comfortable talking with the elderly. Her (elderly) heart and thoughts are similar to our so we had many common topics to discuss.
>
> I initially thought that it would be difficult to get along with elderly people due to the generation gap. However, working with elderly people was one of the most wonderful and memorable experiences in the Service-Learning project.

> The Service-Learning project was worth doing because I have learned a lot and established a bond between members that I never expected. I never thought I could be friends with an elderly person because I thought we have very different lifestyles and different concepts, ideas.
>
> For me, this is a valuable experience. It changed my view of elderly people and gave me a new understanding of them. The elders that I attend class with are active, talkative, and not be too shy to ask questions.

Strengthened intergenerational communication

One question in the pre- and post-test focused on to what extent the participant gained understanding for the values that guide the behavior of the other age group (Table 1, Question 2). The mean score of both elders and students increased when comparing before and after the service. For elders, the mean score increased from 3.9 to 4.44, while for students, the mean score increased from 3.72 to 3.81. Another question focusing on knowing how the other generation interprets events, the mean score of elders increased from 3.72 to 4.11, while for university students, the mean score increased from 3.71 to 4.29 (Table 1, Question 3). Most participants agreed that the arrangement of students paired with elderly improved their interaction with the other generation. The average score was 4.33 for elderly and 4.46 for students (Table 2, Question 2).

On-site observations found that the university students and the elders communicated frequently to complete their tasks. Two examples stand out in the elders' reports and the university students' reflective journals. For the interactive booth game, the teams discussed division of labor, such as who will manage the queue and who is responsible for playing games and interacting with visitors. Similarly, as Ocean Park visitors speak a variety of languages (primarily Cantonese, Mandarin, and English), teams assigned the appropriate teammate to interact with a visitor, depending on language proficiency. If any university students were not strong in Cantonese (*e.g.* non-Chinese Hong Kong citizens or mainland Chinese students), they would ask elders for help. The following excerpts from the reflective journals illustrate these findings:

> She (elderly) always shares her own life experience with us and talked about something related to her volunteer works in her daily life.
>
> Our elder member gave us a lot of support and shared his own experiences with us. In particular, he would share his opinions on working as a team and lead us methodically.
>
> She (elderly) gave a lot of advice to us during the service. For example, she taught us

> how to approach tourists in a better way during our narration service. She put a lot of effort in engaging the visitors.
>
> At lunchtime, we exchanged a lot of knowledge. He (an elderly man) told me about his career, and he gave me a lot of advice on my future work. I shared with him the current situation of my university life and about the academic system.
>
> Service at Ocean Park provides a very good opportunity for students and elderly to communicate because we stay together for the whole day. We had lunch and took breaks together, sharing past stories as well as talking about the future. I (elderly) gave them some suggestions and we discussed those suggestions.

Increased enthusiasm for reciprocal learning

Three pre- and post-test questions relate to reciprocal learning. Mean scores of both elders and university students increased when asked about gaining insight about young/old world (Table 1, Question 5). For elders, the mean score increased from 3.81 to 4.44, while for the students, it increased from 3.57 to 4.25. They also scored higher on whether mixed age groups encouraged them to learn from the other (Table 2, Question 1). The mean score was 4.44 for elders, and 4.40 for university students. On whether they received support from each other during the service, both university students (mean score = 4.78) and elders (mean score = 4.43) scored relatively high (Table 2, Question 6). In their reflective journals, nearly all students and elders agreed that different age groups had different strengths. Students related better to younger visitors, being more familiar with current issues, while elders are able to calmly handle unexpected issues.

The following extracted statements illustrate the above findings:

> We talked to him (elderly teammate) about the relationship between two different generations, particularly parents and children. Listening to the perspectives of different generations, we learned a lot about what we did not see from our perspective.
>
> After working with elderly people for several weeks, I thought that they created a positive learning environment because they were more eager to learn when compared to the students. They showed a good attitude to lifelong learning [the ongoing and self-motivated pursuit of knowledge]. This attitude is very important for us students because we sometimes forget why we are studying.
>
> They (elders) have much more life experience than undergraduates, and they also have a passion to study. When I talked with the elderly, I thought, I want to be like them when I am old. I learned a lot from the discussion and their attitude.

> He (elder) diligently studied the materials used for the narration. When we forgot any information about sea animals, we could immediately ask him.

Constructing a positive relationship between elders and university students

In the post-test, both university students and elders strongly agreed that the arrangement of students paired with elderly fostered a positive relationship between generations. The mean score for elders was 4.67, while the mean score for students was 4.50 (Table 2, Question 3). For the post-test question on whether a cooperative service-learning project can promote intergenerational harmony, the mean scores were 4.55 (elders) and 4.36 (students) (Table 2, Question 7). The content of their reflective journals echoed the survey results:

> If there is another chance for me to work with elders again, I am willing to do so.

> We (students) were lucky we could cooperate with the elders during the service. In my opinion, having the elderly around is good.

> Learning together with different generations was a wonderful experience because it helped to build respect and positive engagement.

> This part (intergenerational cooperation) is my favorite part. I am so thankful that we had the opportunity to learn and work with elders. The generation gap almost did not exist between us, thanks to everyone's cooperation. We acted like a family. We took care of them and they took care of us.

> I like such teamwork with both elder and the students.

> To me, I had a nice experience in a harmonious relationship with my teammates.

Table 1. *Average pre-test and post-test scores among elders and university students*

Question	**Elders**		**University Students**	
	Pre-test	**Post-test**	**Pre-test**	**Post-test**
I felt comfortable when speaking to them	3.9	4.67	4.23	4.36
I valued their guidance and understood their behavior.	3.9	4.44	3.72	3.81
I got to know how other generations interpret events	3.72	4.11	3.71	4.29
I recognize students or elders' vision of the future	3.81	4.11	3.71	4.14
I gained insight about the young/old world	3.81	4.44	3.57	4.25

Table 2. *Average score of elders and university students from the post-test*

Question	**Elders**	**University Students**
1) The arrangement of students paired with elderly encourage me to learn from students/elders	4.44	4.40
The arrangement of students paired with elderly increase the interaction with students/elders		
3) The arrangement of students paired with elderly build positive relationship between you and students/elders	4.67	4.50
4) I think my relationship with students/elders is closer	4.44	4.46
5) I am happy to work with students/elders as a group	4.78	4.61
6) I gained support from students/elders during the service.	4.78	4.43
7) To what extend do you agree that the service-learning project can promote intergenerational harmony?	4.55	4.36

Discussion

In this study, we take a different approach to intergenerational Service learning. Instead of having students be the service provider and elders being the service recipient, we make students and elders work together to be the service provider. This approach has a positive impact on both elders and students, in terms of open communication and reciprocal learning, in turn promoting intergenerational harmony. We discuss our findings in further detail below.

Different goals and expectations influence participant perception

The responses on the pre-test showed that the elders and the university students different expectations towards the service-learning project. Elders were generally willing to work with students, while students were worried about cooperating with elders. This is probably due to the course arrangement. The elders joined the course knowing the service-learning project's details in advance. They understood that they had to cooperate with the students in the Ocean Park service-learning project. It was obvious that those elders not interested in working with university students would not apply or withdraw from the course. Therefore, to a certain extent, these elder participants were a self-selecting group who looked forward to cooperating with the students. On the other hand, the students did not know the details of the service-learning project in advance. Many students registered for the course to meet two Lingnan University graduation requirements for one science-related course and one service-learning course. As in other studies, student participants may have felt obliged to join the service-learning project (Stukas et al, 1999), or perhaps joined the course to 'simply fulfil a course requirement, gaining little out of the experience beyond a grade' (Knecht & Martinez, 2012). Based on the result of the post-test, students experienced a positive change in their view of the elderly. We believe the project's structure facilitated this change: both of the elders and the students played the same role of being a service provider. Both groups of participants carried the same responsibilities and expectations from Ocean Park, regardless of age. We found that effective communication and utilization of talent between the elders and the students were key elements to make this intergenerational Service-Learning project successful.

Intergenerational Service-Learning Projects Promote Reciprocal Learning and Open Communication

In the reflective journals, the university students and the elders provided details on the way the teams encountered problems and how they resolved them. For example, two commonly reported problem were the division of labor among teammates and strategies on attracting visitors to participate in interactive games. To solve these problems, teams had to openly discuss, share opinions, and mutually agree on a solution. As all participants, both students and elders, were working at Ocean Park for the first time, no one was an expert, and thus no assumed their opinion was best. In such a situation, we believe both students and elders were encouraged to openly communicate and respect the opinions of other team members.

In one particular case, the university students relied on their elder teammates: an argument began two groups of visitors over the proper queueing procedure. The university students involved felt anxious and helpless at that moment, but the elder teammates used their maturity to resolve the situation calmly. We believe such situations stimulated the students' open-mindedness and respect towards elders. In such a case, the elder acts as a role model for which students are able

to learn from and follow. How the elder participants calmly deal with contingencies served a framework for the students to refer to when having a need to solve similar problems in the future.

In addition to fuller life experiences of the elderly, students also learned from observing the attitude of the elderly towards the service-learning project. Elders took the responsibility of the narration service very seriously, diligently studying the materials before going to Ocean Park. Many university students mentioned that the elders were more familiar with the information than they were. The effort of the elders pushed the students to stay engaged and work harder. We believe the elders performed so well principally for two reasons: time and sense of responsibility. Elders were able to devote more time to the project because most of them were retired, while the students had to manage four or five academic courses per semester. Furthermore, the elderly had a greater sense of responsibility towards this service-learning project. Our impression was that the elderly viewed this project like a job, and believe it was their responsibility to be well prepared and perform well. This may be because of the richer life experiences of elders, or because the course was voluntary for the elders, but compulsory for students. Regardless of the differences, the students were able to learn by observing the elders. Similar to the existing studies on intergenerational service learning, the student participants regard the elders as role models to follow (Fair & Daphane, 2014; Aemmi & Moonaghi, 2017).

Mutual learning through personal stories

One service day at Ocean Park lasted for 7 hours. Throughout the day, teams took breaks for rest (thirty minutes, twice daily) and lunch (one hour, once daily). Teams often stayed together during breaks, providing opportunities for them to chat in-depth about larger topics. We believe this facilitated mutual learning. Two common topics amongst the teams were about the ‘future’ and ‘current trends’. In these discussions about the ‘future’, the university students would share their dreams and visions, while the elderly would provide advice based on their life experiences. The elderly wanted to understand ‘current trends’ to better understand their own children or grandchildren. Some elderly participants noted that this kind of discussion during service was much more in-depth than the in-class discussions. This is likely because the in-class discussions focused assigned topics focusing on the lecture material, and these discussions would not continue after class.

On the other hand, both the elders and the students mentioned the environment at Ocean Park was relaxed, and teams were free to discuss any topic. Such discussions about common interests and life experiences provided a deeper understanding of teammates and improved mutual learning.

Limitations

We note three main limitations to our study. First, elderly participants were a self-selected group. Elders registered for the course knowing it was an intergenerational service-learning project, and were willing to cooperate with the university students. They fully intended to engage actively, and therefore tended to have positive expectations. Such a scenario may create self-selection bias, influencing the result (Thomson, 2003). Second, data from the summer-semester group arrived relatively late (around 6 months after service was completed) due to logistical problems. Those participants, relying on memory to complete the questionnaire, may not have been able to provide as many, or as accurate, details of their experiences. Lastly, the response rate of the elderly participants was relatively low. We conducted the questionnaire online, which we believe affected elderly participation. Some elderly were perhaps not familiar or comfortable with the online questionnaire, and decided not to respond.

Conclusions and Contributions to Theory and Practice

This study provides strong evidence on the positive impact of intergenerational service-learning projects upon open communication and reciprocal learning, leading to greater intergenerational harmony (Storm & Storm, 2011; Dantzer et al, 2012). Many previous studies on intergenerational harmony place elders as the service recipients/beneficiaries, while students are service providers. At Ocean Park, elders and students are service providers, working together as a team to provide service to the public. All participants are equal, and neither the elders nor the university students enjoy special privileges. Older and younger participants are encouraged to be open-minded and to cooperate closely with each other.

Our findings are coherent with Chan et al. (2013): “Through learning, investigating, communicating and solving problems together, students and elders cooperate and complete the learning journey hand in hand.” Through engaging in a project with a common goal, students and elders experienced a deeper understanding of each other. To form a successful team, members had to establish a strong bond, communicate well, and be committed to the same goal. Participants discovered that each team member had particular strengths and weaknesses, and that cooperation created a team where the whole is greater than the sum of its parts. The Ocean Park service-learning project created an environment where participants were willing to learn from each other, regardless of age. Our conclusion supports the existing literature’s findings (e.g. Storm & Storm, 2011; Dantzer et al, 2012) that when elders and students work together in a service-learning project, their trust and communication strengthens and promotes the sustainable development of society.

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Infusing Service-Learning into Allied Health Profession Curriculum: Perceived Enablers and Barriers

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Abstract

Service learning may offer an innovative perspective in the competing global and national health interests among Philippine universities. The author sought to understand the enablers and barriers of implementing service learning in the context of a premier private Catholic Philippine allied health profession education. Using an in-depth descriptive qualitative design, this study gathered and analyzed by theme transcripts from interviews, field notes and organizational documents. Data were coded and categorized into perceived barriers and enablers, according to *The Self-Assessment Rubric for Institutionalization of Service Learning in Higher Education* (SRISL) by Furco (2002). A wide range of enablers and barriers to implementing SL in one of the university's health-related program thereby emerged. The results of this study may support further uptake of service-learning as a signature pedagogy in the allied health profession in the Philippines, particularly for its emerging unique professional identity and role in enhancing disability-related health outcomes.

Keywords: occupational therapy; Philippine higher education; disability-related health outcomes

Introduction

A central part of Philippine educational reform is to have universities connect more with communities and provide a reciprocal service orientation in which the universities reach out to their communities with knowledge and services. It mandates Philippine universities to undertake more innovative and transformative approaches to produce future graduates equipped with skills, knowledge, and attitude to respond to local, regional, or national social development needs.

Specifically, the Philippine health system calls for improvement of health services delivery, including its accessibility in the rural and socioeconomically disadvantaged areas. Although advancing health research and medical knowledge has a positive impact on the health of most people, it does not sufficiently address the complex health issues in the Philippines. A first concern is that medical advances cannot replace the humanistic element. Care, empathy and compassion of the healthcare provider, will remain essential components of effective healthcare delivery (McManus,1991; Burks & Kobus, 2012). Furthermore, trends in future global workplaces show an increasing need for teamwork and collaborative problem-solving skills, interpersonal communication, and social skills to complement these technical skills (World Economic Forum, 2016).

However, researchers note a decreasing emphasis of these skills in most medical curricula, with the assumption that these skills develop naturally in the 'hidden' curriculum as students navigate their training (Battaglia, 2016; Geraghty et al., 2016). Therefore, in preparing future healthcare

professionals, it is important for schools to build these skills intentionally into their professional education curriculum (Battaglia, 2016; Burks & Kobus, 2012; Geraghty et al., 2016). Service-learning, then, may offer an innovative perspective in these competing global and national health interests among Philippine universities.

Literature supports service learning as a high-impact teaching strategy in higher education (Kuh, 2008) and as a signature pedagogy in the field of occupational therapy education (Schaber, 2014). It offers a broad array of benefits for universities and the communities they serve. However, much of the available literature comes from the United States. Furthermore, the bulk of the literature demonstrates the benefits of service learning among secondary schools and community colleges. Literature on the adoption of service learning among higher education institutions (HEI) remains limited and presents practitioners with more contextual challenges. This study therefore seeks to understand the enablers and barriers to service learning in the context of a premier private Catholic Philippine allied-health professional education.

Literature Review

Simply defined, service learning (SL) is "an experiential education approach that is premised on reciprocal learning "(Furco, 1996, p. 2). However, SL takes many forms and the literature records a wide range of conceptualizations of service learning. The most widely used definition of SL comes from Bringle and Hatcher (1996, p. 222):

> a credit-bearing educational experience in which students participate in an organized service activity that meets identified community needs and reflects on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility.

Bringl and Hatcher base their formulation on the works of John Dewey and David Kolb's educational and experiential theories. Giles and Eyler (1994) as well as Jacoby, 2014) agree that reflection is a key pedagogical feature of service learning.

Another widely used definition of SL states that:

> [s]ervice learning means a method under which students or participants learn and develop through active participation in thoughtfully organized service that is conducted in and meets the needs of a community; is coordinated with an elementary school, secondary school, institution of higher education, or community service program, and with the community; and helps foster civic responsibility; and that is integrated into and enhances the academic curriculum of the students or the educational components of the community service program in which the participants are enrolled; and provides structured time for the students or participants to reflect on the service experience (National and Community Service Act of 1990, p. 13)

Stemming from community development theories, this definition highlights a second key feature of service learning. Reciprocity, as described by Sigmon (1979), helps distinguish service learning from other closely associated terms, such as internship, field education, community

service and volunteerism. Furco (1996) provided a continuum of this distinguishing feature of reciprocal relationship with his conceptualization of SL. Internship and field education place university students as the locus of control of service provision by deciding who, what and when services will be provided. In contrast, in community service and volunteerism, the recipients control and benefit from these services.

From these descriptive definitions, researchers draw out an understanding of two key features of SL. These are *reflection* as a pedagogical strategy and *reciprocity* as a guiding principle for community partnership and learning.

Additional studies find that SL yields significant improvements in student learning and development (Celio, Durlak & Dymnicki, 2011; Yorio & Feifei, 2012). Furthermore, recent literature (Battaglia, 2016; Roskell, White & Bonner, 2012) is widely supports the use of service learning as an experiential pedagogy for developing those humanistic skills said to be in decline in health-related professional curricula. It aids the holistic development of the health professionals, both in discipline-specific skills and generic health professional skills such as interprofessional practice and cultural responsiveness (Crawford et al., 2017).

Aside from the benefits of service learning, current literature continues to explore the practice of service learning among international higher education institutions. There are many more service-learning programs in the United States than in Australia, Asia, or Africa (Kerins, 2010). Obviously, this poses difficulties in identifying the most critical success factors across different countries. This article seeks to address this gap by exploring factors that support as well as hinder the successful implementation of SL in the Philippines, where this is a relatively new approach.

Support Factors

Educational and Historical Context as Major Drivers. One of the major drivers of SL was the educational and historical context (Stanton, Giles & Cruz, 1999). For example, SL flourished in the 1990s as a result of the US government call to augment the role of American higher education in nation-building (National Task Force on Civic Learning and Democratic Engagement, 2012, p. 2). Similarly, the Humboldtian idealism of combining teaching and research together with the European culture of volunteerism has been seen as an opportunity in paving the way of SL in the German universities in the early 2000s (Garrett, Sharpe, Walter & Zyweitz, 2012). Conversely, Langworthy (2007) argued the contextual difference on Australian historical convict-beginnings and Platonic influence on education made SL not readily embraced widely in Australia.

Change in Mindset for Educational Reform. Launching a SL program requires a change in mindset and it is not simply adding a new program (Stanton, Giles & Cruz, 1999). SL should not act as a supplement to the formal curriculum, but as a necessary component of student learning, explicitly linked to academic growth. This best distinguishes service learning from volunteer activities (Xing & Ma, 2010; Zlotkowski, 2011). Sachs and Clark (2017) attributed the success of Macquarie University to its commitment to making community engagement their core business and not as an add-on feature. The synergized tripartite university function legitimized

service learning as their core business. The creation of a 'hub' integrates it into the university fabric, across disparate functions of teaching, research, and community development. Such structural integration encourages collaboration instead of competition and it institutionalizes service learning (Kezar & Rhoads, 2001; Roberts et al., 2018). In Asia, education exists solely as an intellectual endeavour. SL called for a shift from this mindset to recognizing "[p]edagogically, service learning comprises of the 'head' plus 'heart' plus 'hands' " (Xing & Ma, 2010, p. 24).

Design of Service-Learning Program. The role of faculty members in designing appropriate SL activities is crucial to ensure achievement of good learning outcomes. This means ensuring good student-placement fit and well-structured reflection activities. Waterman (2013) found that Student-Placement Fit, defined as meeting the students' motivation (whether intrinsic or extrinsic) during their service-learning experience, significantly affected the success of the program. This also meant that the relevance of the right settings and the related tasks to their course content helped assure that the experience indeed enhanced their learning (Giles & Eyler, 1994). More importantly, well-structured reflection had the strongest link with the learning outcomes (Celio et al., 2011). In allied-health professional education, Parmenter and Thomas (2015) further found that ongoing reflections, as a key feature of occupation-focused SL, enabled learning about occupational therapy's underpinning paradigm as well as development of professional values of being a therapist.

Enabling Processes. Most literature recommends creation of a separate office to lead service learning (Bringle & Hatcher, 1996; Furco, 2002). By contrast, Macquarie University use a different organizational structure for its service-learning program. It created a hub as "an (evolving) configuration" (Sachs & Clark, 2017, p. 277) to encourage institutional collaboration. Furthermore, Sachs and Clark (2017) find that a clear and close alignment between service-learning objectives and the university's mission and core values is one of the most important successful factors. Macquarie University recognized the unique contribution of SL to higher education through its curriculum. This alignment rationally determined the form SL would take, the breadth of SL across departments and student levels, and the focus of program monitoring and evaluation. This successful implementation of SL at Macquarie University provided case study evidence of how SL has contextually transformed this Australian university (Sachs & Clark, 2017).

Reciprocity, as the key feature of SL, defines Macquarie University's network and partnerships. Administrators do not measure success by the number of communities enlisted, but rather by the social impact of their programs (Sachs & Clark, 2017). This reciprocity principle shifted the model of community development from a "needs based" to an "asset based" paradigm. This shift is "in contrast to doing work *for* communities, *in* communities or *on* communities. [The] newer paradigm emphasizes doing work with the community" (Bringle & Plater, 2017, pp. 301-302).

Resource commitment, particularly financial resources, plays a vital role in the success of any program. Because of limited internal grants and funding, universities need to look for external grants to fund these SL activities. Macquarie University used these grants to offset the incurred costs and subsequently to foster more engagements (Sachs & Clark, 2017). However, internal

grants presumably work better towards service-learning implementation without reliance on external funding (Furco, 2002).

Hindering Factors

Alternatively, literature also shows several hindering factors or barriers to implementation of SL that led to the failure or non-institutionalization of SL programs in some universities.

Organizational Culture and Tensions associated with service learning. Kezar and Rhoads (2001) recognize the role of academic leaders in balancing the organizational tensions associated with SL. For instance, Langworthy (2007) argues that the tension between the public good offered by SL interest and the increasing external pressure on workforce outcomes and graduate attributes may have led to the Australian universities not to engage in SL. Moreover, tensions within the organization such as the lack of faculty interest and budgetary support, the lack of time and coordination for SL, and placing SL on a marginal status are the most cited barriers in implementing SL (Bringle & Hatcher, 1999; Stanton et al., 1999; Waterman, 2013). Reshaping into SL-conducive organizational culture, increasing the incentives for SL engagement, and re-aligning the recognition and reward system to include SL are some suggestions to resolve these organizational tensions (Kezar & Rhoads, 2001).

Academic Culture. The academic culture questioning service learning's legitimacy as an academic activity is also a possible hindrance to its implementation. Where does SL fall under the three functions of the university: teaching, research, or community service? Kezar and Rhoads (2001, p. 167) argue that the functional 'organizational boxes' universities need restructuring to encourage interdisciplinary collaboration more conducive to service learning. Garrett et al. (2012) further argue that the challenge of SL in German universities lies on the traditional belief that the concept of educating engaged citizens should be in the public democratic space of society and not necessarily in the more formalistic arena of higher education. Moreover, Langworthy (2007) recommends a change of terminology, to reduce confusion and 'trivialization', and to reflect a more academic or scholarly nature.

Financial Challenges. Funding schemes often make a difference in successful service learning. For instance, federally funded Australian universities rely on the competitive ranking results that emphasize research outputs and employability, not community engagements or impact on social transformation. Langworthy (2007) extrapolates that this was one of the reasons for Australian universities not embracing service learning. Opazo, Aramburuzabala and Cerrillo (2016) conversely attribute much of service learning's success among Spanish Universities to financial support through the European Credit Transfer System (ECTS).

Growing Ethical Concerns. Lastly, Xing and Ma (2010) highlight ethical dimensions of service learning in Asian literature. They explored the extent of the academic community's involvement vis-à-vis the governance of the university and its partner communities. In particular, service learning programs must show they enhance the community's capacity to be self-sufficient over the charitable service provision. Furthermore, possible exploitation issues exist for communities and students, such as the use of free student labor to perform duties otherwise performed by paid workers.

Methodology

The initial step in adopting service learning into the context of Philippine higher education is to explore the key support enablers of, and barriers to, service learning in the context of a private Catholic university in the Philippines using the *The Self-Assessment Rubric for Institutionalization of service learning in Higher Education* (SRISL) by Furco (2002).

SRISL is one of the widely used tool that characterizes the success factors in development of SL in higher education. It utilizes five dimensions, namely, the philosophy and mission of service learning, the faculty support for and involvement in service learning, the student support for and involvement in service learning, the community participation and partnerships and institutional support for service- learning. More than eighty American higher education institutions had used this tool to identify the stage of development of service learning in their institutions and subsequently provide the direction to steer the specific dimensions towards its institutionalization (Furco, 2002).

Implementation science frameworks guided this study in how to adopt successfully new SL programs and practices. Implementation science is utilized to promote the systematic uptake of evidence-based research findings and practices into routine practice to improve the quality and effectiveness of services (Nilsen, 2015). Specifically, determinant frameworks among the implementation sciences recognized that implementation is a multidimensional phenomenon, with multiple interacting influences (Nielsen, 2015). It is generally aimed to understand influences, whether facilitator or barrier, on implementation outcomes. The author chose to use the SRISL, being closely relevant to the service-learning practice and its consistency with the characteristics of these determinant frameworks.

This study used an in-depth descriptive qualitative design. The two sources of data used to inform the analysis were a) semi-structured interviews with thirty-one (31) key stakeholders or intended users about their views about SL and their perceived enablers and/or barriers in its implementation and b) a document review of relevant organizational reports and plans on service learning in the said university. Transcripts, field notes and organizational documents were analyzed using thematic analysis. Data were coded and categorized into perceived barriers and enablers according to the SRISL framework.

Individual conversations with three key administrative staff, which includes the Vice-Rector for Academic Affairs, SimBahayan Director as the community extension arm of the University, and the Dean of the College of Rehabilitation Sciences, took place on campus. The author also interviewed three department chairpersons, ten faculty members and fifteen students from the College of Rehabilitation Sciences about their views about SL and their perceived enablers or barriers in its implementation using semi-structured questions (Table 1). Reflections and organizational insights on ongoing SL activities grew from these conversations combined with a review of relevant organizational reports and plans.

Table 1. *Interview Questions*

Semi-Structured Questions Used in the Interview	SRISL (Furco, 2002)
1. How do you understand service learning? 2. What are possible benefits of service learning? 3. What are examples of service-learning activities in which you have participated?	Dimension 1: Philosophy and Mission of service learning
4. What motivates you to participate in service-learning activities? 5. What hampers your participation in service learning activities?	Dimension 2: Faculty support for and involvement in service learning Dimension 3: Student support for and involvement in service learning
6. How does the community view the participation of students in service learning? 7. How does the university view the participation of students in community activities?	Dimension 4: Community participation and partnerships
8. How has service learning evolved in the College and/or University? What factors led to this current state of service learning? 9. What problems or challenges did you encounter in engaging with communities? How did you manage or resolve them?	Dimension 5: Institutional support for service- learning

Results and Discussion

Background on the University of Santo Tomas

The University of Santo Tomas (UST) is one of the top universities in the Philippines with twenty-three (23) colleges and fifty-six (56) undergraduate academic programs. It is a 400-year-old private Catholic university with a 20,000-student population. As the Royal and Pontifical University of the Philippines, the University is renowned as a strong traditional educational institution. This paper focused on one particular unit called as the College of Rehabilitation Sciences (CRS). It is one of several health-related colleges. It offers four programs: (a) Physical Therapy (PT); (b) Occupational Therapy (OT); (c) Sports Science (SPS); and (d) Speech and Language Pathology (SLP). The Dean of the college is responsible for its overall operation. Department chairpersons manage their respective programs.

Our subjects discussed a wide range of enablers and barriers to implementing SL in CRS. The significant perceived enablers were the implicit alignment of institutional mission with service learning, the early service-learning groundwork in each department, faculty members' enthusiasm, the preferred partner communities and the symbolic administrative support for service-learning initiatives. The perceived barriers were: (a) fragmented views among students, faculty and administration; (b) restricted faculty and student engagement; (c) minimal incentives for faculty and students to participate in service-learning; (d) the limited 'reciprocity' concept among the partner communities; and (d) the lack of actual administrative commitment and support. The result of this self-assessment also showed the early stages of development of service learning at UST.

Perceived Enablers

Implicit Alignment of Institutional Mission with SL. SL activities appeared to be peripheral to UST's institutional goals and strategies. As a Catholic university guided primarily by the teachings of St. Thomas of Aquinas, UST's mission has three core values: competence, compassion and commitment. While the components of compassion and commitment are clearly relevant elements of SL, the curriculum does not explicitly link these to achieve one of the key graduate attribute of servant leadership. In the same light, the Thomasian educational philosophy of contemplative study in service of truth (Lorezca-Tangco, 2014), though closely attuned with SL, was not clearly evident in its curriculum. Competence in professional therapy practice appears to be the main focus of the curriculum design. Thus, it lacked a clear link to the social-transformation mission stated in its strategic plans. Specifically, students and faculty members see little evidence, so far, for CRS's strong social-transformation agenda for the vulnerable and marginalized population of people with disabilities.

Beginning Service-Learning Groundwork. The Dean recognized that the OT department took the lead on SL development when it introduced a community-based rehabilitation (CBR) course into its curriculum in 2010, and expanded to introduce social justice issues using a rehabilitation-science lens. It was admittedly difficult at the beginning for the OT department to gain acceptance and legitimacy of this pedagogy. As an evolving course, CBR offered a relatively new perspective on disability-related health issues by putting the community as the focal point for disability prevention and health promotion activities for allied health professionals.

Nevertheless, CBR shifted the paradigm from a medical to biopsychosocial model of disability, with the twofold benefit of attaining student outcomes and meeting community health needs (Sagun-Ongtangco & Abenir, 2016). The CBR course not only expanded the disability-related practice of occupational therapy, but also helped develop a unique professional identity in the Philippine setting.

Optimism of Faculty Members. Despite claiming it was their first time to hear about SL or having limited understanding of SL, faculty members have discussed various elements of SL in their current practice such as:

> I think our community-based rehabilitation (CBR) course is an example of service learning because it is geared towards community development through disability prevention. (Faculty member 1)
>
> Our internship program has a community setting as one of the students' placement. (Faculty member 2)
>
> We encourage our students to participate in Lib-Rehab, an annual program of providing free therapy services in the community. (Faculty member 7)
>
> The current group of interns are conducting research on tele-rehab in the community in exchange for free rehabilitation services to its community members. (Faculty member 8)

These responses showed that SL is closely associated with working in a community (locational purpose) and working on a community (therapy service provision). Moreover, it also appeared that SL is closely intertwined with the nature of the therapy profession, which is inherently part of the allied health professional identity (Parmenter & Thomas, 2015). As such, community involvement becomes integral part of the allied health profession curriculum for developing both professional therapy and humanistic skills. Although the lack of reflective pedagogical strategy and attendance grades diluting the basic essence of SL, there were also some faculty members who saw the potential of SL to:

> Not only develop these humanistic skills but also to promote social justice as perceived from the rehabilitation science lens. Recognition of health disparities and inequitable access to healthcare services are among the many social problems that need to be incorporated into the service-learning program. (Faculty member 5).

This recognition may lead to the potential expansion of SL into the social change agenda as described by Butin (2010), including disability-related health reforms such as disability-inclusive communities.

Preferred Partner Communities. SimBahayan, as the community development arm of the University, acted as the liaison between the community and the Colleges, matching the academic needs with the community needs. SimBahayan Director proudly shared that the number of partner communities had increased to one hundred twenty (120) over a few years. The program uses a needs-based framework, by which the University identified and established the needs of partner communities prior to forming a partnership (Director of SimBahayan).

For CRS, it was relatively easy to establish disability-focused community partnerships in rural and socio-economically disadvantaged areas, with limited access to therapy and health services. It included public schools, rural health units, villages and non-profit organizations with disability-related concerns, among many others. Most of these activities were discipline-specific, and were thought of as extra-/co-curricular in nature, such as free health screening, wellness programs, English language classes, book reading for education and humanities programs, and tree-planting or community clean-ups for the social sciences programs.

Symbolic Administrative Support. The organizational structure of the University clearly reflects its tripartite functions of instruction, research and extension services. Each function is clearly the province of a Vice-Rector controlling an operational budget. For the instruction function, there is the Office of Vice-Rector for Academic Affairs. For the research function, there is the Office of Vice-Rector for Research and Innovation. For extension services or community development, there is the SimBahayan office, under the Office of Vice-Rector for Religious Affairs. Being a Catholic University, SimBahayan represented the union of Church (SIMbahan), Family (BAHAY) and Nation (bayAN). SimBahayan was the innovative result of the quadricentennial celebration of the University in 2010.

Perceived Barriers

Fragmented Views. The most common SL understanding reported by both faculty members and students is community service, either curricular, co-curricular or extra-curricular. Some students associated SL with internship. They shared stories about their experiences of practising the skills learned in the classroom with real patients (in contrast with simulated patients). Some faculty members and students related SL to occasions when they volunteered their services in the community (as compared to the clinic or hospital). Few faculty members described SL as an exchange between learning skills for disability-inclusive community development by students and the empowerment of partner communities on disability-related health issues. Two faculty members mentioned that both community and the academe shared the mutual benefit of SL with an end goal of improving the disability-related health outcomes in their communities.

The department chairpersons raised a different perspective. They focused on the pedagogical component of SL and its impact on the values formation and humanistic skills such as cultural competency and interprofessional collaboration skills.

The administrative officials had more fragmented views on SL. On the one hand, the CRS Dean viewed it as a way to merge research and community service. On the other hand, the SimBahayan Director viewed it as mobilizing the students to participate in socially-relevant activities. He further elaborated that SimBahayan will get a boost in support and funding if it portrayed the university as an international SL hub, reportedly important for the university's ranking and program accreditation purposes. Furthermore, the Vice-Rector for Academic Affairs viewed it as the pedagogical tool that will shape future Thomasian graduates as global citizens.

Reflection as a learning strategy received little mention in these conversations. Participants may have assumed that learning had occurred because of their community experience. The role of faculty in facilitating learning through reflective strategies was not evident. Reflection, as a key pedagogical feature of SL, was not explicitly elucidated in these conversations.

This fragmented vision of SL on the part of various stakeholders indicated a strong need to clarify and harmonize SL understanding to appreciate its intended benefits, particularly in the allied health profession curriculum.

Restricted Engagement of Faculty and Students. Limited understanding and time constraints resulted in minimal faculty involvement.

> *I would like to be part of community activities, but I have no more time for this. (Faculty member 8)*
>
> *Inasmuch I would like to make frequent community visits with my class, we don't have the extra time to do so. (Faculty member 2)*

Although opportunities for SL were available to students, their academic workload took a higher priority:

> *We would like to do it, but our academic studies come first. If only we have spare time, we would participate in community activities. (Student 3)*
>
> *It takes so much time to get into the communities . . . and the traffic jam makes it horrible. The travel time actually makes it difficult, not the actual activity. (Student 4)*

Similarly, students perceived the National Service Training Program (NSTP), a nationally mandated course for all first-year students to engage with the community, as a 'hassle' or irrelevant to their learning to become allied health professionals, as it lacked in the utilization of health-related skills in their community activities. Compliance to the traditional allied medical profession curriculum design seemed to be more appealing to students than the altruistic values of SL.

Minimal Incentives. Faculty members considered community service as a non-rewarding work. They under-recognized it as an innovative pedagogy. A number of faculty members shared that engaging in community service contributed little to their faculty promotion. They were further pressed to balance the three functions of teaching, research, and community service, with the latter most likely neglected. Researchers and advocates have consistently raised this as a key barrier to SL implementation (Roberts et al., 2018). With time-consuming logistical preparations, compounded by compliance with tedious government regulatory requirements for off-campus activities, some faculty members felt unmotivated and considered it not a worthwhile activity.

Similarly, there were few incentives for students to participate in SL activities. Accustomed as they were to mandatory attendance requirements in their courses, students claimed they expected a reward for their participation, either with an attendance grade or through bonus points for meritorious effort. For the faculty members, they gave these bonus points because "*without these incentives, students will most likely not participate in such extra work" (Faculty member 5*). This counteracted the key feature of SL, in which students receive grades based on their learning outcomes, not solely on their participation (Zlotkowski, 2011).

Limited Reciprocity. While the number of partner communities has increased over time, SL's impact on the community and/or student learning remains unexplored. The quality of these programs and partnerships, and their impact on social transformation will need more attention. SimBahayan usually arranges the community activities and specifies the number of participants, resources, dates, and times according to the availability of the students and faculty. The Director found this convenient, as partner communities readily altered their stated needs to accommodate SimBahayan's constraints, in return for free services. The concept of 'reciprocity' (Sigmon, 1979, p. 10), understood as placing resources in the hands of those being served, was not evident in this example.

Limited Actual Buy-in. Despite the potential of SL to influence graduate outcomes, the departmentalized organizational structure may often lead to silo thinking in teaching, research, and service functions. Therefore, this may limit the collaborative culture needed to cultivate SL.

Moreover, limited student and faculty recognition, grants and awards were available for successful achievement. Conversely, instances of non-compliance reportedly received negative reinforcements, such as budget reduction and increasing procedural bureaucracy. This non-positive organizational culture may have hindered the creative and innovative thinking necessary for SL to take a richer form in this university.

The faculty and students alike confronted multiple layers of bureaucracy for community engagement. The SimBahayan Director may symbolically oversee the university's function in community development. However, both the student affairs office and the academic affairs office have the most to say in approving extra-curricular activities. The community-development coordinators monitor the community activities within their colleges, while the department chairpersons monitor the integration of SL as a pedagogy in their respective departments. Highlighting this lack of a coordinating entity, the SimBahayan Director lamented that:

> The recent CHED policies have reduced the number of community activities of the students by 50%. There has been so much time, effort and money just to get those CHED permits and it had to be cancelled at the last minute because the permits were not processed in time. (SimBahayan Director)

The Director lamented further that the modest budget allocated to SimBahayan did not support all the community-related activities. Most often, students had to do their own fund-raising to implement their community-related activities. Furthermore, faculty and students often competed for the same sponsors. For instance, the mayor's office of the partner community might be asked to fund the transportation and food expenses for different activities.

These conversations indicated that SL in UST may potentially be the vital link in fulfilling its Thomasian educational mission, but it may need to: (a) organize more effectively; and (b) implement SL so as to effect the authentic social transformation it hopes to achieve. The fragmented understanding of SL, seen as mostly mandatory, extra-curricular activities within the community (rather than with the community), is typically characteristic of early stages of SL program development. Reciprocity, as a key element of SL, can be further enhanced to overtly align the Thomasian educational mission and disability-related health SL initiatives. Furthermore, CRS faculty should reconsider employing pedagogical reflection strategies on SL activities to bring the humanistic skills of compassionate care into the allied health curriculum.

The tripartite structure and academic culture of the university shaped the way SimBahayan functioned as a separate unit from teaching and research. Such organizational tensions may contribute to defeating the altruistic intentions of service learning. Beyond serving as an essential coordinating entity, SimBahayan should provide a broader range of pedagogical and research support and ethical practice to support institutionalization of SL in the University. By recognizing the early stage of development of SL in UST, it has already shown potential growth and development opportunities to fulfill its 400-year-old Thomasian mission in modern times. The SRISL tool had helped identify the specific enabling dimensions, which can aid in overcoming the perceived barriers. Ultimately, these strengths shall help advance the institutionalization of SL program at the University.

Conclusion

Responding to the call for relevant allied-health professional education, we need to ensure that learning experiences in the actual communities contribute to the redesign of health service delivery, as well as to allied health professional development. This study highlighted the multi-dimensional perspectives from the academic community of faculty members, students and the partner communities regarding many key concepts which may affect the SL implementation. While the benefits of SL are clear to the academic landscape, it was apparently not adequate to drive its successful implementation to attain its graduate outcomes as well as the resultant disability-related health outcomes for the communities we serve. The results of this study may inform development of continuing education, training and support for service-learning initiatives for further uptake of service learning as its signature pedagogy in the allied health profession. SL can potentially support allied health profession curriculum for its emerging professional identity and role in enhancing disability-related health outcomes. Likewise, the fragmented views, time constraints and limited institutional buy-in of SL are the key barriers in need of attention as practitioners advance signature SL in allied-health professional education. This may potentially make service learning a core component of the allied health education curriculum and further scale up service learning across the various programs in the university.

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Civic Media Practice Facilitating Democratic Process in Two Environmental Community-Engaged Research in Taiwan

Phan Thi Loan and Wan Ting Hsu

Abstract

Environmental protection is an increasing concern across Taiwan. Facebook and LINE enjoy high penetration in Taiwan, are potential platforms for democratizing the research process. Citizens participate in evaluating their environment, contributing to its protection as well as having voice in decision making in the environment community-engaged research (eCEnR) than ever before. However, along with increased citizen engagement, researchers also see a decreased trust in institutions, including government, media, and news. Based on in-depth interviews with organizers and participants, the analysis of posts on Facebook group, LINE messages, and websites of two ongoing eCEnRs, we assessed the impact of civic media practice on the democratic process. This article analyzes how social networking sites or applications function in four activities of the democratic process. Network building, discussion forums, distributed ownership and persistent input help organizations overcome distrust of institutions and enhance civic media's ability to foster connections and create more usable interfaces between communities and institutions.

Keywords: Facebook, LINE, disaster-response communities, social network sites

Theoretical background

Civic media and related concepts

We live in a digital world with popular technologies such as instant messaging, video sharing, photo sharing, social network sites, podcasting and blogging. With them, we connect with friends, conduct business, study online, entertainment, and much besides. Cellphones not only make calls, but also access the Internet, create photos and videos, and share them across social network sites/apps. Social network sites (SNS) emerged as websites where users construct a public or semi-public profile with a list of other users whom they connect and interact within the systems (Boyd, 2008,). Many SNS are part of daily life, such as Facebook, LinkedIn, Twitter, Myspace, YouTube, Flickr and others (Noor & Hendricks, 2012). Social network apps (SNA) are applications for mobile devices, or website apps, accessible to personal computers, like Whatsapp, Wechat, LINE, etc. Interestingly, many SNA are integral components of SNS to strengthen the site's flexibility and user-friendliness. Messenger, for example, is a popular Facebook app. SNS/SNA have been changing the way we communicate, collaborate, share and learn with our friends, family, peers and communities, even in different times and locations. They also enable researchers to engage communities of concerned citizens.

With complex technological projects, besides SNS/A, organizers use web-based APPs which are programs accessed over a network connection, rather than a device's memory. Technologies, designs and practices that produce and reproduce a sense of working toward common goods are known as civic media. According to Jenkins (2007) civic media is any medium which fosters or enhances civic engagement and as a bridge connecting community members and make them enable to strive together for common goods, thereby facilitate the democratic process (Gordon & Mihailidis, 2016). This characteristic is a main distinction from civic technology, or technology that solves a specific civic or organizational problem and emphasizing mainly on solving that civic or organization problem. Whereas the core value of civic media is for common goods. The community, by civic media practice, evaluates not only the immediate results that solve a problem but also how the project advances the common good. This means how the project connected people and helped them to maintain, repair and improve its work over the long term (Gordon & Mihailidis, 2016). Therefore, practitioners must balance technological and organizational values, create and use civic media in negotiating power and benefits of stakeholders.

Democratic Process and Community-Engaged Research

Definitions of democracy vary, but simply put, democracy is "a system in which the government is accountable to the people, who each have roughly equal say" (Gordon & Mihailidis, 2016, p.30). In a democracy, the people have a free and informed discussion of public issues. This requires at a minimum, freedom of speech. In digital age, according to Gilman (2017), for democracy to survive, it requires civic engagement that emphasizes the role of civic media/civic technology in enhancing the democratic process—the way we make democracy happen. However, experience has shown that along with increased citizen engagement in many aspects of life, there is a decreased trust in institutions, including government, media and news (Gordon & Mugar, 2018). Therefore, it is necessary to understand if innovative civic media can counteract this tendency. Emphasis on the role of media builds on scholarship in communications and media studies that examines communication patterns and the role of media in democracies (Goldberg, 2010; Dahlgren, 2009; Levine, 2014).

In community engaged research (CEnR), researchers and citizens share mutual benefits of "a collaborative process between the researcher and community partner that creates and disseminates knowledge and creative expression with the goal of contributing to the academic discipline and strengthening the well-being of the community" (George, 2014, p.3). Citizens are empowered to participate, contribute, and make decisions thereby helping to ensure that the research's results are directly beneficial for the community. In other words, CEnR helps to strengthen the democratic process by helping citizens have roughly equal voice in community. Normally, the concerned problems of countries around the world are various with common issues like over/under population, environmental pollution and lost biodiversity, global warming, terrorism (Friedman, 2008). In Taiwan, those issues get into details with many social movements related to human rights, economic policies, public health, environment and so on (Hsiao, 2011).

The environment is an increasing concern to most Taiwanese citizens, and it is increasing as the quality of environment decreases. Engaging in environment projects is one way to facilitate the democratic process, in which citizens can participate in evaluating their environment, and contribute to its protection, as well as having voice in decision-making. Therefore, environment is one of the topics attracting the attention of CEnR. Environment is the totality of surrounding conditions in which a person, animal, or plant lives or operates; it comprises natural resources and natural process. Economic development and constant population increase lead to the overuse of environment. Therefore, research of environment and environmental issues need to be community based, because from the community, scientists will discover existing problems, the causes and effects, and the ways to overcome negative effects. Using technology would create more diverse and more effective approaches to the community. ‘‘It is not a new field by any means, but there is definitely new found energy’’ (Attygalle, 2015, p. 39). In many CEnR projects, researchers use various means to approach, cooperate and collaborate with community through games, speculative design, or digital storytelling, etc. Especially the development of SNS/SNA has made and developed effectively online community engagement.

However, increased using of digital tools brings not only opportunities but also challenges to citizen engagement processes. When researchers do not know/listen to their audience - the community and abuse of technology in CEnR; it is very likely to lead to asymmetry in power, interests and expertise knowledge of both researchers, organizers and communities (Gordon & Murga, 2018). Mismanaged technology in CenR can create conflicts between community members and their expectations and benefits, which makes it hard to reach the consensus in decision-making (Attygalle, 2015). Furthermore, improved access to information may reduce knowledge differences observed between researchers and the community, which can work against the co-learning process. Using civic media also arouses the anxiety of lacking physical co-presence in community, when people coordinate in Facebook instead of face-to-face (Gordon & Mihailidis, 2016). People no longer need to convene together to vote for a decision when they can use Facebook to make a poll, they also do not need to gather to have a march for university policy changing when they can collect signatures of students by online petitions. Those can impede caring each other and real connection for the long-term benefits and even increase irresponsibility because of its anonymity of virtual connections (Gordon & Mihailidis, 2016). Therefore, this research seeks to answer the question, how does civic media facilitate the democratic process in eCEnR in Taiwan? Knowing this can help organizations enhance engagement with community. In this way, communities can trust in organizers and create more connections between previously separate communities and institutions.

Background of Taiwan

Democratic Process and Civic Media in Taiwan

Taiwan is a democratic republic state. According to Hsiao (2011), since 1980, this country has witnessed about 20 social movements in diverse fields. Recently, there are two notable social movements namely Anti-Media Monopoly Movement (2012–2013, 反媒體壟斷運動) and the

Sunflower Movement (18 March–10 April 2014, 太陽花學運). The movements have taken place in various aspects from economy, human rights to environment with the effective support of information and communications technologies (ICTs) (Chuang, 2004; Hsiao, 2011). According to National Communication Commission (NCC)'s Report in 2016, the percentage of people using cell phones in Taiwan is higher than one hundred percent (NCC, 2016). Although we cannot assume that every single person has a cellphone, it seems many people have more than one. People can easily access to Internet by free Wi-Fi in public places like an MRT station, on buses, at convenience stores, and other places. Among the most-used technology devices, smartphones and their features seem to be exploited as much as possible to connect to vulnerable communities and nature lovers to collect, update and process information. With so many using telecommunication services, great potential exists for citizens to communicate, collaborate, share and learn in environmental community-engaged projects.

Taiwan ranks 8th in the world for Internet penetration. Seventy-two percent of Taiwanese people use the Internet (Digital in 2017: Global Overview). Taiwan is also open to social network sites/apps, with the wide usage of social networks like Facebook, YouTube, and LINE (Figure 1), which create a favorable digital platform for information exchange and the engagement of citizen in governmental/non-governmental projects.

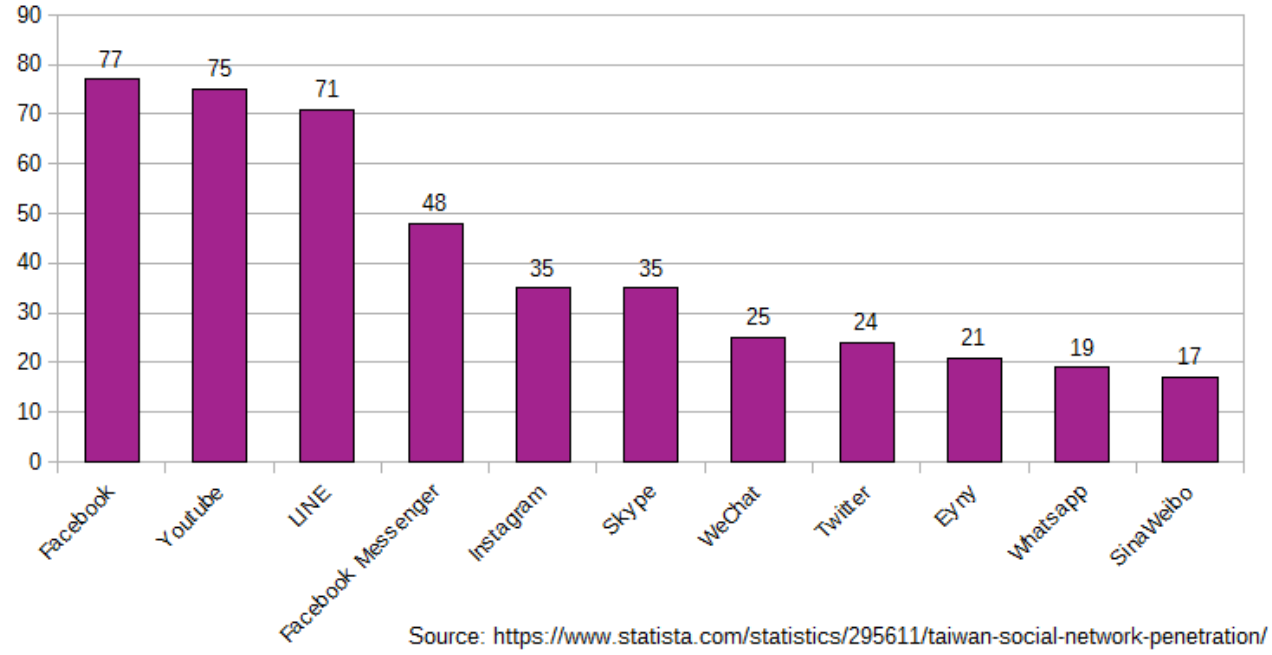

Figure 1. Penetration of leading social networks sites in Taiwan as of 3rd quarter 2017 (unit: percentage) (Digital in 2017: Global Overview).

The State of Community-Engaged Research in Taiwan

After the lifting of Martial law in 1987 in Taiwan, civil society regained freedom of association, which allowed the development of community engaged research in Taiwan. In 1994, the Council of Cultural Affairs Executive Yuan launched a "Comprehensive Community Development" policy. The idea of "community" started to spread to every corner in Taiwan (Chen, 2018). For example, for the Council of Agriculture's Forestry Bureau, Executive Yuan turned this idea into a new policy of community forest management (Forest Bureau, 2002).

Under this trend, newly established community colleges provided more opportunities for academic institutions to build community partnerships. For example, the National Taiwan Normal University's Department of Adult & Continuing Education, started their ongoing partnership with Wanhua Community College in 2008 (Hsu, 2015). Since 2007, the Ministry of Education has promoted several pilot projects.

In 2017, these projects merged into a "University Social Responsibility Project". The Ministry of Science and Technology started the Humanity Innovation and Social Practice project in 2012. Both projects seek to encourage universities to work with local societies on local issues (Chen, 2018). Since then, CenR in Taiwan has spread into many different fields, including nursing (Yeh, 2010), natural resource management (Chang, 2005), rural development (Chung, 2018; Hsiao, 2018), disaster resilience, and environmental monitoring.

Environmental Community-Engaged Research

In Taiwan, in many different fields, including: ecology, astronomy and meteorology have applied eCEnR. ECEnRs inform many citizen-science projects that conduct large-scale standardized data collection to raise public awareness and knowledge of specific environmental issues. Most often, governments, academic institutions, or NGOs initiate projects. (Dali, 2018). Some are part of international efforts, such as eBirds (https://ebird.org/taiwan/home). Taiwanese team (Appendix I) initiates many more, beginning with the Taiwan Amphibian Database in 2003, led by Prof. Yang Yi-Ju of National Dong Hwa University. Similar projects targeting different species developed from this project. Here we examine the most famous citizen science project in Taiwan - Taiwan Roadkill Observation Network (Hsu et al., 2018).

Apart from the citizen-science projects listed above, thousands of community projects emerged in the last 20 years related to disaster mitigation. As Taiwan frequently suffers from typhoons, floods and landslides, the government launched programs to help local people build disaster resistant communities. For example, the Soil and Water Conservation Bureau helps communities, at high-risk for landslides build a resilient community, while the Water Resource Agency helps communities with high flood potential. With eCEnRs, technology such as geographic information systems (GIS), or closed circuit television (CCTV) also contribute to the research. Citizen media, with its capacity for real-time updates, improves Taiwan's rapid response to various combined disasters.

For this study, we chose projects having certain criteria. First of all, it is community-engaged research which: (a) is for public good; (b) responds to community identified need; (c) involves collaboration of community members, academic researchers and students; (d) is an environment project deployed in Taiwan; and (e) applies at least one social network site/app. Therefore, we selected two Taiwanese eCEnRs, one Citizen Science Project and one Disaster Risk Reduction project, to see how civic media enables community members and researchers to collaborate and disseminate knowledge together for the academic goal and the community's common good.

Research Social Networking Sites/Apps and Two Selected eCEnR Cases

Like all SNS/A, Facebook (FB) and LINE blur the line between personal and professional. They share many same functions to build up a platform for social connection, discussion, collaboration, and other civil engagement activities. Both offer private and group messages, news feeds, timeline posts, status updates, demographic data, polls and surveys, likes, dislikes, shares and other reactions, comments and discussions, notification, photos & videos, hash-tagging support and mood faces (Foulk, 2018 & Russel, 2016). Most importantly, useful and easy interfaces make both FB and LINE popular with thousands of social media users.

FB has some features that LINE does not, such as friends' recommendations, livestream, add friends by name or email address, or posting on a friend's homepage (Noor & Hendricks, 2012). On the other hand, LINE is much more convenient for adding friends by ID, QR codes, shake it, or cellphone numbers. Faster connections and photo sharing makes LINE a common tool for working group communication. LINE is also a critical tool in Taiwan's disaster prevention for message spreading, emergent contacting, and information collecting. In March of 2018, the National Science and Technology Center for Disaster Reduction (NCDR), Taiwan's authority for disaster prevention and management research, announced a new collaboration with LINE's Taiwan branch. (NCDR, 2018) They released a new official APP LINE account for Taiwan's emergency information, available to all LINE users. We chose two typical cases that use social network sites/apps for their eCEnR. One case bases its research on FB. The other uses Line for its research.

Case 1: Facebook and Roadkill Reporting Back Web APP in Citizen Science Project

Taiwan Roadkill Observation Network (TaiRON) is a citizen science project launched by Taiwan's Endemic Species Research Institute (ESRI). This project started from a FB group created in 2011 August, not originally intended for a well-planned citizen-science project. Using FB's functions, the group members helped ESRI's researchers gradually form their research goal, build an operating website, information-collection procedures, and so on (TaiRON Official Website, 2018 June 26). Community members connect their FB account with the Roadkill Reporting Back Web APP, using their smart phone, following the four steps to collect data and send it to ESRI (Figure 2). The Web APP links to the FB group. Once a community member sends a datum on the Web APP, it is instantly shared with the FB group, so that a researcher can

instantly check the data with the community member. According to Dali Lin's in “Directory of Taiwan Citizen Science Communities” (Dali Lin, 2018), TaiRON is one of the earliest citizen science projects using a Facebook group to collect its research data. It has become the biggest FB-based citizen science project in Taiwan, with more than 14,000 group members and more than 100,000 data points collected. After TaiRON, many new FB-based Citizen Science projects emerged, aiming to follow its operational model. Therefore, we suppose that TaiRON is a suitable case for our study on an eCEnR relying on FB.

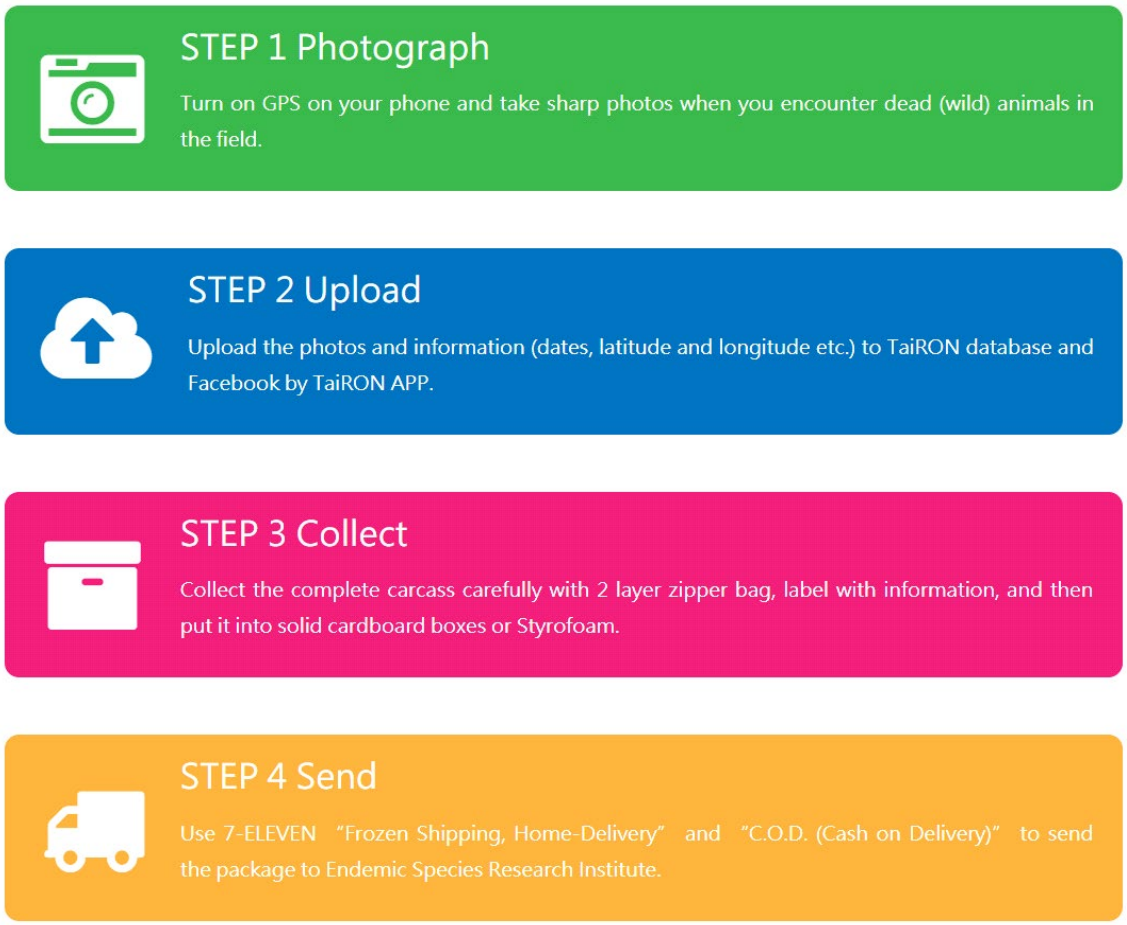

Figure 2. Participating Steps for TaiRON Community Members to Follow. Source: TaiRON Official Website (https://roadkill.tw)

Case 2: LINE and Tainan Water In-Situ Mobile APP in a Disaster Resistant Community (DRC)

As one of the Water Resource Agency promotion in the flooding Disaster Resistant Community projects to the high-flooding-potential villages all around Taiwan, Xin-Jia, located in Tainan county, is emerging as one of the most successful cases. Xin-Jia DRC project has won the

premium for 3 years in the competition of flood resistant communities and their flood-mitigation skills are very mature.

As other DRC projects, the Xin-Jia assistance team from National Cheng Kung University Disaster Prevention Research Center contacted the community. The team helped community members to set up a disaster-response community team. The team provided training in recording and reporting rainfall and real-time disaster information to researchers. Local volunteers found using LINE groups to inform, connect, and cooperate made emergency response faster and more flexible. As with other DRC projects, competent authorities or local governments designed some APPs for disaster prevention, for example, Tainan Water Situ APP, or Landslide Disaster Prevention APP. These APPs use instant messaging to inform local residents. Other APPs enable DRC volunteers to report back on an evolving situation. However, unlike the Roadkill case, Tainan Water Situ APP works independently from social networking sites/apps.

Stakeholders and the role of scientists in eCenR of two case studies

To clarify the stakeholders in these two cases, we analyzed the stakeholder map for each case (Figure 3 and Figure 4). In both cases, stakeholders cluster into four groups: Researchers and/or Organizers; Community members; Governments and/or Authorities; Students/Volunteers.

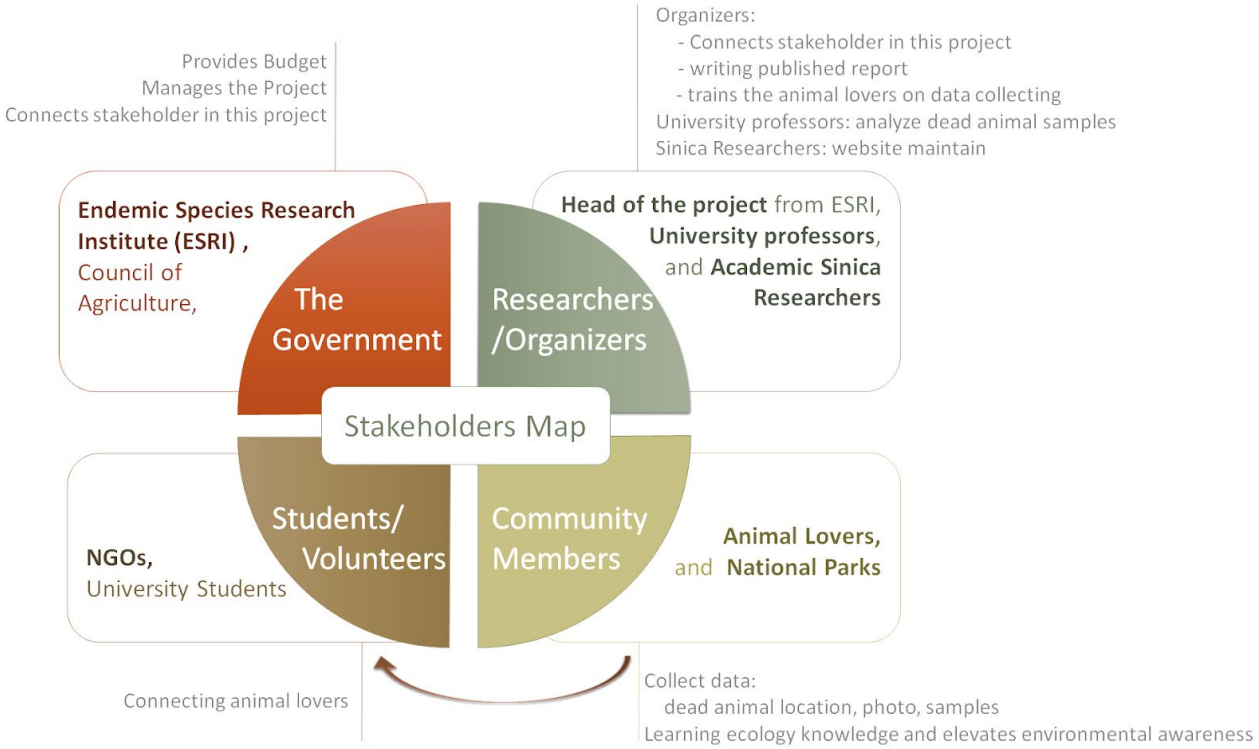

Figure 3. Stakeholder Map in Case 1 - Taiwan Roadkill Observation Network

In DRC community case, the researchers and the organizer is the assistant team from National Cheng Kung University Disaster Prevention Research Center. The community members are the villagers in Xin-Jia village, including the community leader. The volunteers are the flood volunteer team in the village. The authorities include the Water Resource Agency and local district office (Figure 4).

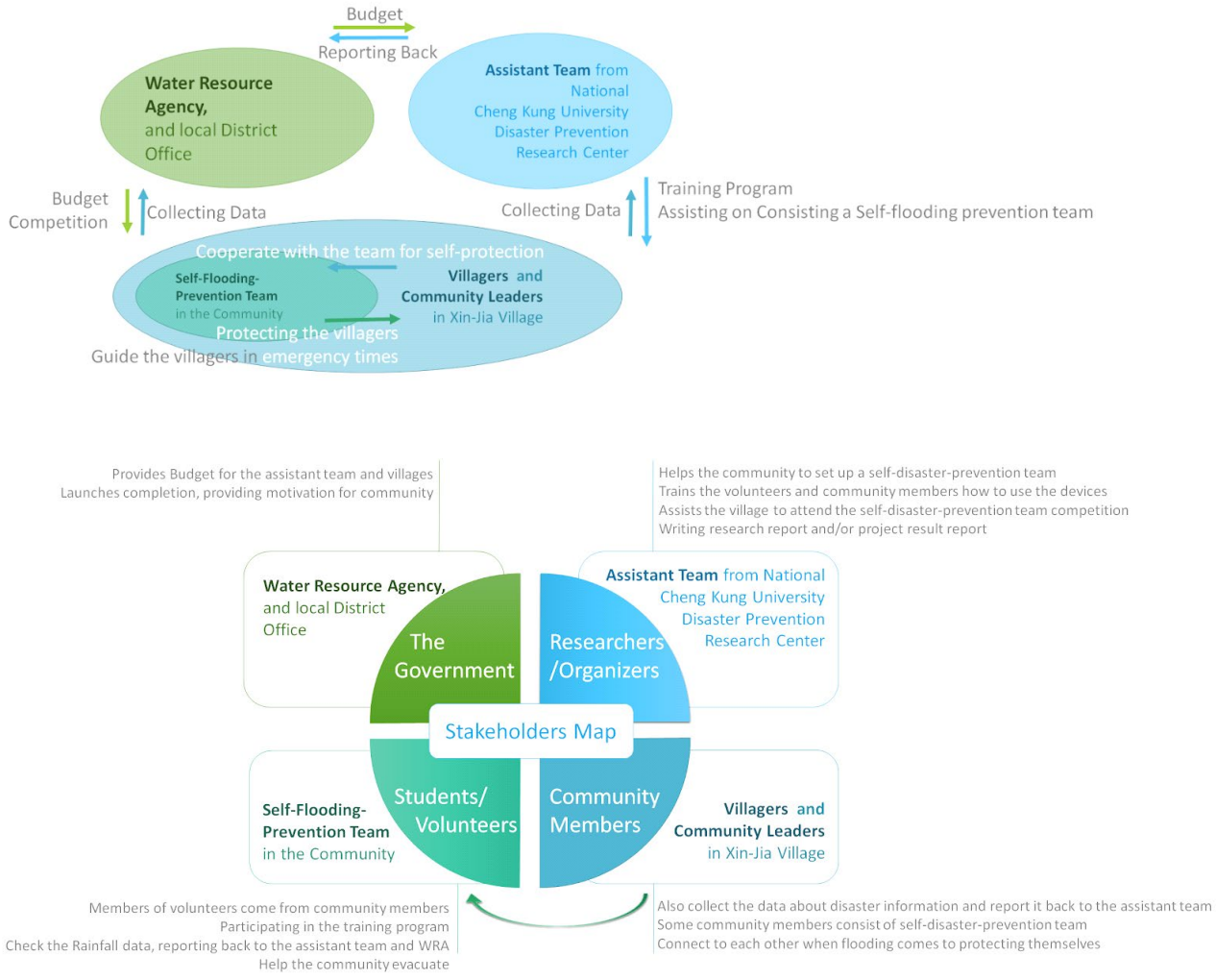

Figure 4. Stakeholder Map in Case 2 - Disaster Resistant Community (DRC) in Xin-Jia Village.

The interesting similarity both cases is that they are ongoing research projects that have been lasting for more 7 years. Thus, both cases have gone through a period of trial and error. However, while the DRC is a government-funded project, TaiRON was initially a self-funded project. Thus, different budget considerations influenced selection of appropriate digital tools. DRC chose LINE, a formal collaboration between National Science and Technology Center for Disaster Reduction (NCDR) and LINE's Taiwan branch. TaiRON chose Facebook because,

“Facebook is free. If it fails, we have no loss or stress.” (According to Mr. Lin, 26 March 2017 in Hsu et al, 2018). Furthermore, the boundaries among TaiRON's stakeholders such as people, community, and volunteers often blur, owing to the participants’ initiative and higher willingness to take part. DRC’s participants are residents of the disaster-affected village and their participation is not only voluntary but also their responsibility. Moreover, the complexity of DRC’s APPs, coupled with the villagers’ lower education level, require more support and intensive training from project assistants. We compared the two to see how different civic media influence the research's democratic process.

The roles of participating scientists are distinct based on each project’s goals and features (see Table 1). In TaiRON, scientists organized stakeholders, raised funds, managed personnel, collected data, wrote reports and hosted conferences (figure 3). The project’s nature is spontaneous and derives from the demands of a specific group—in this case, activists, socialists, and environmentalists who care about environmental issues and desire to raise public awareness. At the same time, in their university roles as teachers or researchers, they inspire, connect and inform other potential participants, and attract attention from government and the general public.

DRC derived from urgent demand to prevent and mitigate flooding in a specific community. The government acted to organize the project and collaborate with a local university. Here, university scientists are participants rather than organizers. They provide knowledge, technical support and skills training for the community (figure 4). They also benefit from data collection and sustaining funds from the government. This project is amply structured, and scientists do no fundraising, but they train communities in data collection and flood prevention.

The facts show that in DRC the role of scientists has blurred in the last three years, as the local community gained confidence in its ability to gather data and act for themselves. However, in TaiRON, as more community members engage, the more scientists engage the community. Simply put, in TaiRON, scientists are distinct and respected parts of the community.

Table 1. *Basic Comparisons between the Two Cases*

Project Name	Taiwan Roadkill Observation Network (TaiRON)	Distance Resistance Community (DRC)
Type	Citizen Science Project	Disaster resistance community project
Funding Source	Self-funded on startup with sustaining Government funds	Water Resource Agency
Social Media	Facebook – Roadkill Reporting Back Web APP	LINE – Tainan Water In Situ mobile APP
Focus	Road-killed animals	Disaster Prevention
Goals	Research and education to raise the Taiwanese population's awareness on environmental issues	Flooding prevention awareness and data collection
Organization	Network of independent scientists and activists.	Government funds with technical and scientific assistance of a local university
Geography	Large scale, covering the whole of Taiwan	Small scale, covering Xin Jia Village (Tainan)

Methodology

Framework for Civic Media Practice Evaluation

The first step in evaluating civic media practice is plotting the starting point, which is based on social structure (weak or strong relation with community), and the short-term or long-term objectives (Gordon & Mugar, 2018). Thereby, practitioners can evaluate the existing situation and developing process of their project. In this research, we used the technique of plotting the starting point with questions to identify the general process of practicing civic media in two projects from beginning (2011) to current (2018). Below are questions using to plot the existing project point:

Social infrastructure (X axis)

- What level of connection do you have to real or perceived end users?
- How strong are your current relationships?
- Have you been working with or in the community for a long time?
- If you are new to the community, are there trust brokers in place (NGOs, community groups) that can facilitate connections?

Objectives (Y axis)

- Do organizers intend this particular project to be short-lived or long-term?

- Will the media or technology developed remain available for an extended period?
- Is the media or technology designed to capture attention through its novelty?

If responses to the first set of questions are generally negative, your starting point will be towards the left. If they are generally affirmative, it will be towards the right. If responses to the second set of questions are generally negative, your starting point will be below the X axis. If affirmative, then it will be above it.

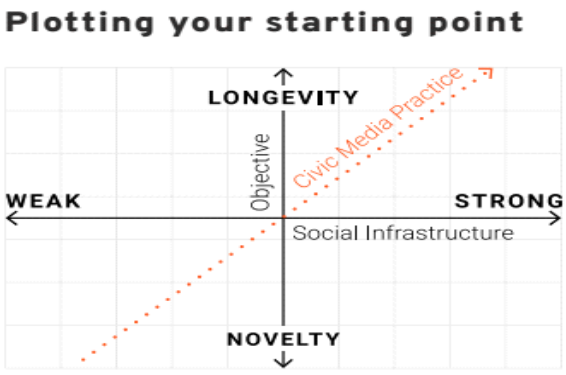

Figure 5. Civic media practice takes place over time across two dimensions (Adapted from Gordon & Mugar, 2018, p.14)

In our research, we evaluated the starting point relatively by interviewing organizers of two projects. After that, we assessed progress based on 4 activities. There are 4 activities that represent civic media practice in facilitating democratic process being network building, holding space for discussion, distributing ownership and persistent input (Table 2).

Table 2. *Activities of civic media practice (Gordon & Mugar, 2018, p.14)*

Activity	**Definition**	**Explanation**
Network building	The act of convening either in person or online for the purpose of social connectivity	Practitioners create online or offline space for stakeholders share experiences knowledge and acknowledge the intersectionality of constituent identity
Holding space for discussion	Assuring that there is time and space for discussion that makes room for multiple viewpoints and is tolerant of dissent	Media can help to hold regular meetings, workshops where the interests and needs of stakeholders can be articulated and increase the responsibility of stakeholders to the issues of the community by supporting work to directly address those issues
Distributing ownership	The designer or convener builds capacity of all	To reduce the asymmetric in power and expertise knowledge among stakeholders by sharing and encouraging power

	stakeholders to reproduce or modify designed activities.	dynamic of stakeholders in taking the rein of practices. The participants can have equal opportunities in co-design process and distribute expertise across multiple stakeholders
Persistent input	Inputs into products or process from stakeholders continue beyond initial release or implementation.	The long-term relationships of practitioners and community which influence the design and entire practice of civic media, building mutual trust and closer proximity to community problems.

In our research, based on civic media practice evaluation guidance (Gordon & Mugar, 2018) and the functions and features of the social media sites used (Facebook and LINE), we selected hypothesized indicators based upon three major criteria: ease of understanding, relationship to the four activities, and data availability (Table 3). Beyond this, we also added one dimension – digital tool selection. This actually stems from the first four aspects, but we argue that this also can be a significant clue of democratic process in CEnR.

Table 3. *Adopt civic media practice in facilitating democratic process in two selected projects (Adapted from Gordon & Mugar, 2018, p.25-26)*

Activity	**Framework questions**	**Relevant functions of Facebook, LINE & APPs**	**Questions for Each project**
Network building	• Have you developed new connections in your host community? • Do you believe you can form further connections with this community? • Would you undertake further projects with this community?	a. Connect members b. Interaction among community members and organizers c. Inform, listen, and disseminate information d. Stay informed by messages and sharing e. Invite people for conferences and events	- How do you use Facebook/LINE in developing the new connections/ interactions/ inform/ disseminate information in community you are working in? - How do you use Facebook/ LINE in calling on community members to make further connections (conferences/events)? - How do you use Facebook/ LINE in doing survey/starting a new project in the future with this community?
Holding space for discussion	• Do you take steps to engage people outside of your immediate network?	a. Public/message space for discussion b. Admin roles c. Topics of discussion d. Conflict	- How does FB or LINE's public wall and private inbox help people in the community to engage in the immediate network?

	• Do you ensure non-expert perspectives or lived experiences are heard?		- How does the admin decide the topic and facilitate discussion (especially when conflicts occur)? - How are the voices of all stakeholders listened in FB/LINE discussions, polls, or information sharing?
Distributing ownership	• Do you create opportunities for stewardship by members of the community? • Do you share the process and outcomes of your work to encourage adoption of your ideas by external stakeholders? • Do you address power asymmetries by creating pathways for non-experts to influence the project's shape and objectives?	a. Sharing/training knowledge b. Learning from each other c. Feedback / complain / solution d. Empowering e. Photo's responsibility/ownership	- How do you use FB/LINE for creating opportunities for members in community sharing/training/learning from each other? - How do you use FB/LINE in sharing the process and outcomes of your work to encourage adoption of your ideas by external stakeholders? - How do you use FB/LINE to addressing power asymmetries in feedback/complain/ empowering and photo's responsibility/ownership?
Persistent Unit	• Do you keep the feedback loop open after the project's initial phase? • Do you engage in long-term conversations about local issues and challenges? • Are you collaborating with people that have long-term relationship with the problem space?	a. Long-term relationship concerns/ between members, b. Connection between virtual platform and reality (activity) c. Mutual benefits d. Constant support/emergency information to/from community	- How does the FB/LINE help in keeping long-term conversation/relationships (constant support/emergency information) between members about local issues and challenges? - How does the FB/LINE help the connection between virtual platform and real activities? - How does the FB/LINE help to collaborate with people that have long-term relationship with the problem space? - How does the FB/LINE help to get further mutual benefits?

Digital tools' selection	a. Function b. Budget c. Terms & Policy (APP, Facebook) d. Convenient to use e. Time f. Localization	• Why does your project select FB/LINE? • What are pros and cons of this tool? • How has it changed since you first used it? Why? What were your solutions?

Data Collection and Content Analysis

Because the project platforms are social network sites (Table 1), it is a favorable condition for collecting data to analyze both projects' reality, historical development, stakeholders mapping of two projects. Based on the framework of civic media practice evaluation (Table 2), we modified a list of semi-structured questions (Table 3) for in-depth interviews with different stakeholders.

Firstly, in each project, we collected information from websites, organizations, Facebook fan pages, and Facebook groups. Besides, we also analyzed raw text from messages (LINE), social media posts (Facebook) to evaluate content and interactions between stakeholders. Thirdly, after the in-depth interview, we converted the resulting transcript into a verbatim document and coded it to identify starting point and also to analyze it according to the five characteristics of civic media practices listed in our table (Table 3).

Semi-Structured Interview

We used semi-structured interviews with the organizers of the project and volunteers in each project (Appendix II). In the DRC case, we attended the disaster-response community exercise and interviewed the village leader and a government official. In our questions we focused on how the civic media (FB, LINE, APPs) help them on their collaboration with the communities and the researchers, and also the limitation and difficulties they have encountered during the project. From the answers and observations, we find the answers that respond to our framework in table 3 and our research questions.

Results

In spite of having different types of civic media practices, both cases achieved a measure of lasting impact in their respective communities. Our analysis found that no single SNS/SNA meets all project demands in terms of functions, effective budget, efficiency, or time. Organizers' flexibility plays an important role in selecting tools or organizing off-line training to operate smoothly in our four activities of civic media practices of network building.

Plotting starting point of civic media practice in two projects (from 2011-2016)

In the TaiRON project, according to the interview with Te-En Lin (Personal Interview, July 5th, 2018) he mentioned 3 milestones of the process based on the breakthroughs in the number and diversity of members, as well as contributions and recognition from communities to projects. In the initial year, 2011, there were about 200 people in Roadkill Facebook Group. These people were in the "Ecology Circle's Stratosphere[1]," including biology professors, high school teachers, ecology lecturers, and nature-group participants. This relatively small circle extended their network by inviting their classmates, families, and friends to join. From 2011 to 2012, the number of people in Roadkill FB group rose; however, its growth slowed at the end of 2012, because almost all the people in the Stratosphere are already in the group, until 2013 when the Rabies Outbreak in Taiwan brought media's attention to TaiRON. That event made TaiRON "go viral," attracting social media attention and public influencers. Thus more people joined in. Since 2016, about 1,300 people annually join the Roadkill data collecting process with strong connections with other nature-groups, for example, the Society of Wilderness, or Wild Bird Associations around Taiwan. Today, about fourteen thousand people participate in Roadkill Facebook group. An average three thousand people per day actively participate[2] in discussions. In general, the civic media practice process of TaiRON shows a positive trend with strong social infrastructure and long-term objectives (figure 6).

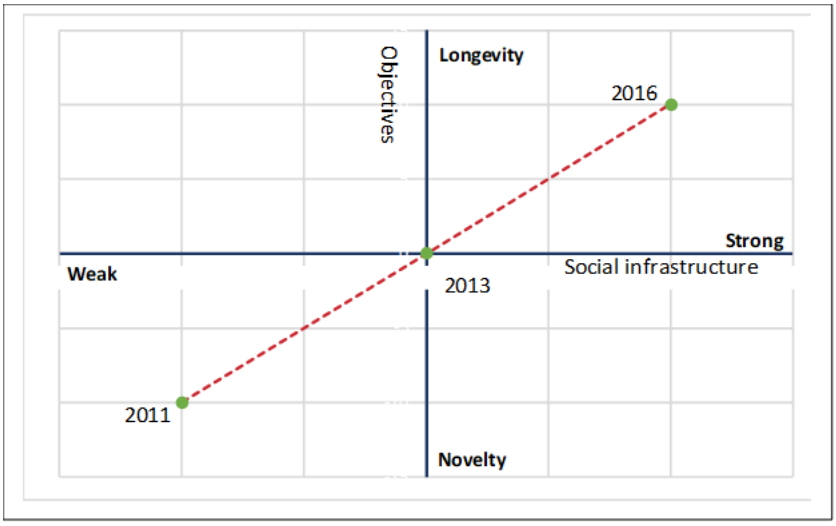

Figure 6. Civic media practice takes place over time cross two dimensions in the TaiRON.

In the case of DRC, there are no significant milestones in the civic media practice process as in TaiRON. According to the project organizer, Chen-Chian Li (李鎮, personal interview, July 5,

[1] The phrase "in the Stratosphere" (在同溫層) is a common phrase in Taiwan describing a small group of people sharing similar values and caring about the same issues. It also implies that these people have difficulties explaining or raising concern among people who are "outside of the Stratosphere".
[2] According to data provided by Facebook. The company's algorithms define "actively participating" by likes, shares and comments.

2018), in the project's initial period, organizers focused on attracting public attention (novelty) by designing a user-friendly APP. Given the project's urgency and complexity, stakeholders built strong connections with frequent meetings and trainings. "DPR team members meet volunteers from village at least 1 time/1 month," Chen-Chian Li told us. Since 2016, as Xin-Jia village improved its disaster prevention practices, almost running the project independently, DPR made plans to work with a new village, spending less time in Xin-Jia. Thus, community-engaged projects gain the highest level of success when communities continue to operate a project independently after the researchers leave. It also reaches the highest level of longevity. Therefore, although outwardly the social infrastructure weakens, it is a positive indication of civic media practice in facilitating a democratic process for this project (figure 7).

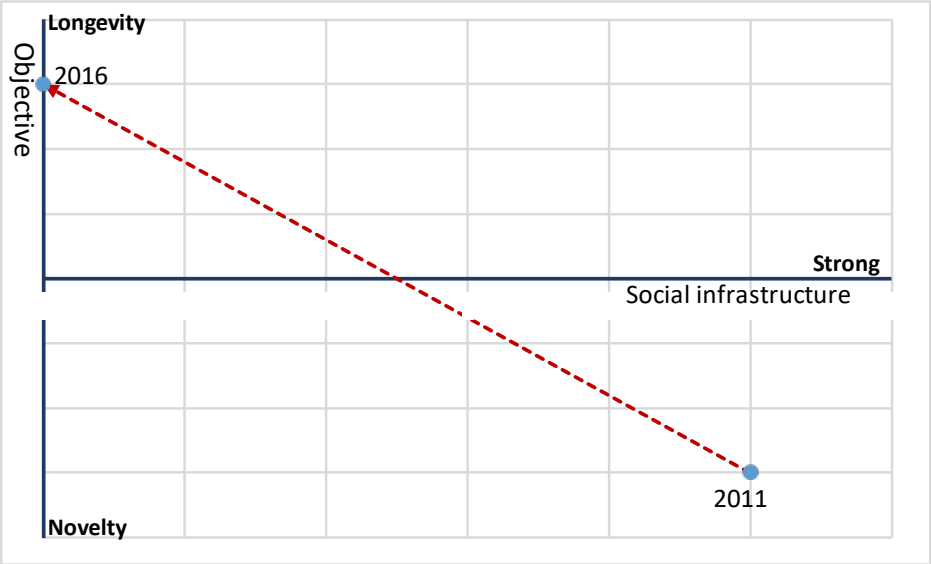

Figure 7. DRC project at Xin-Jia village: Civic media practice takes place over time, across two dimensions.

There is No Perfect Digital Tool

Selecting the right eCenR tools for any project needs to consider time, budget and data quality as well as ease of use and range of functions. Based on each project's features (fund sources, data features, participants, and common goals), organizers select and build workflows around the functions of their respective digital tools. Interestingly, both projects combined digital tools. TaiRON used Facebook and a web APP, and DRC used LINE and mobile APPs.

On the matter of budget, mentioned above, TaiRON used FB to increase participation and broadly disseminate messages. However, data quality depends on the time the users devote to uploading the photo. This may take time, or users may elect to send lower resolution photos. Either choice will influence the timeliness or quality of data. Therefore, the web APP or mobile APP is necessary to deal with the weakness of FB in this regard. The web APP in this case benefits from an engineer voluntarily designing and maintaining it. The Web APP connecting

with Facebook can help the researchers improve data quality by checking data with the up-loaders on Facebook, pick up samples (dead bodies) in time. However, after getting government funding, organizers decided to use it for designing a mobile APP, which they believed would be more user-friendly. However, mobile APPs depend strongly on the policies of Apple and Android systems, which are costly to maintain. Therefore, because of frequent changes to mobile APPs, the organizers decided to use the web APP. Other users complained and suggested the project should stick to FB. Nevertheless, that approach cannot guarantee the quality of data, so the organizers have decided to use FB and web APP for now.

In the DRC project, localized function is important in a disaster-prevention case so that mobile APPs for different counties and mobile APPs for different disaster-potential areas are provided to the users. Because of the support of government for designing and operating mobile APPs, the combination of LINE and 2 mobile APPs work very effectively. LINE is free for users and the change of system policy is not frequent. LINE is good for instant / emergent contact, and message disseminating in a small group of people. Nevertheless, some weaknesses of LINE are it is not convenient for discussion and the users can miss information in the discussions:

> For us [the assistant team] if we want to discuss something with the community, we do not discuss it by Facebook or LINE. Sometimes we call each other, or we just meet-up. As far as I know, most villages also choose to meet up for discussing things. Because for the important online messages, we still need a checking process, to make sure that it is correctly conveyed to our message receivers — Chen-Chian Li (Personal Interview, May 25, 2018).

With mobile APPs, the main weakness lies in the changing system policies of Apple or Android as well as resources for designing and maintaining the system. However, the mobile Apps are easy to use and can guarantee data quality (the accuracy and currency). Therefore, combination of LINE and mobile APPs helps the project work well especially in special projects like DRC.

Balance the mutual benefits in selecting digital tools is the clear sign of democracy. Digital tool selection takes place throughout the whole life of a project with replacement of unsuitable tools and update new ones, in which participants can propose opinions, influence/engage to the decision of using this digital tool not another. To benefit all stakeholders and avoid further conflicts, organizers must listen and learn what is needful, so that participants have equal voice and share of agency. To specify, with the participants, they care the convenience in using tools and the outcome of data to which they contributed:

> In my survey, yes, you can see some feedback that are negative comments. There are participants who complain of not seeing the research results of this project. In such a case, they will have no willingness to continue their participation. —Chia Hsuan Hsu (Personal Interview, May 30, 2018).

TaiRON also made changes to its array of digital tools. Facebook alone was convenient for participants but not for organizers (data not accurate or timely enough; hard for manage data). Facebook and web APP yielded more accurate data, and was less expensive, but not very convenient for users. With funding, Facebook and mobile APP improved data quality and they worked better for organizers and users. However, this solution imposed higher costs. Finally, it went back to Facebook and web APP (cheaper, still convenient for organizers but some users complain about its unfriendliness). TaiRON addressed the democracy problem by enhancing the quality of outcomes to prove the data effectively improves the environment. It lets citizen scientists know that "Your data Matters". Therefore, only a small proportion of participants has left the group because they thought their actions did not help on the environment. Besides, the organizers with their great effort in keeping Facebook open, although it runs the risk of being reported and blocked due to FB's policy (the bloody dead animal photos may be reported by some FB users as violent message). FB helps TaiRON broadens to its audiences quickly, those are main reasons make the outstanding success of this project in eCEnR in Taiwan

> Because TaiRON is an open Facebook group, it is unique. Other groups collect beautiful photos, only we collect bloody photos. It attracts many people's attention. Some of them are specialized in information engineering ... actively contacting us, asking us what they can do to help us ... and so that why we insist on keeping it open, although we are considered disgusting by some people.—Te-En Lin (Personal Interview, 2018).

By comparison, in the DRC, participants give two reasons why mobile APPs (landslide and flood App) are not user-friendly. Firstly, they are digital tools for specialists, which require knowledge and familiarity with disaster phenomena to use effectively. Secondly, these apps also need specialized technical skills, so the organizers devote part of their training time to make participants more knowledgeable about natural disasters and improve their technical skill.

In brief, the democracy can be trade off by the quality of data. However, to decrease the weakness of digital tools in convenience of using without impacting the quality of data, budget, function and time, the organizers in two eCEnRs spend more efforts in maintaining the open platform for member to check the project effectiveness and connecting among members as well as helping the participants in getting familiar and using proficiently the tools. As a result, it can help all stakeholders get their mutual benefits in those eCEnRs.

Civic Media Facilitates Network Building

Networking building is an important step in the democratic process when the organizers "convene members to create the engagement of citizens in projects either in person or online for the purpose of social connectivity" (Gordon & Mugar, 2018, p. 14). In both projects, digital tools work in diverse ways to connect, inform and disseminate information to citizens.

In TaiRON, Facebook connects people from different fields, from real to virtual network and vice versa. Chia Hsuan Hsu, a participant of TaiRON, is also conducting research about TaiRON participants' learning experience:

> [In my survey] It is clear that many people want to continue engaging into this project because they can make new friends here… Actually not many members join TaiRON's offline activities. However, it matters a lot that so many people still consider making new friends here. It means that even if you do not attend offline activities, you can still meet new friends in this platform—(Personal Interview, May 30, 2018).

However, organizers focused and condensed the information disseminated in Facebook. "We share those messages related to TaiRON's purpose. If it is too broad, there will be too many junk messages. The group members… willingness to participate would decline "—Te-En Lin (Personal Interview, May 23, 2018)"

DRC members use LINE particularly to support a LINE group that connects people from different communities instantly in disasters and different LINE groups act to contact or gather different groups of stakeholders. Community members in each disaster zone use their LINE group to report situation to the organizer. Therefore, LINE is an important approach for sharing emergency/disaster information. Because the LINE group's function is so well defined, there is seldom junk information. This feature makes information more accurate and timely, which is most important to the disaster resistance community (Figure 8). However, although the mobile APPs used are important devices for community members and the general public to check disaster information, the landslide APP does not work well because people seldom know it well enough. The organizers said it was because of too little promotion.

Figure 8. A representative situation report to the online community during Tropical Storm, Linfa 2015. Source: Xin-Jia Village (2014) Tainan Flood Disaster Resistant Community Annual Review - Community autonomy evaluation Xin-Jia Village (Chinese)

In each project, the level of engagement differs according to segmentation in citizen engagement. In TaiRON, the interaction depends on their perception of how they benefit, their ability and their available time. Chia Hsuan Hsu (Personal Interview, May 30, 2018) shared that he did not get involved in TaiRON deeply until he began his research. Most participants have varying levels of interaction, with twenty percent of members who are active and twenty to thirty percent more who interact very little. “Frankly, although this Facebook group has more than 14 thousand members, I believe deeply engaged people only account for about 10-20%.” — Chia Hsuan Hsu (Ibid., 2018).” For the participants, FB is the channel to help them improve knowledge or collect data for their own research”. He also supposed that FB group helps members improve ecological knowledge and most participants agree that join into TaiRON makes them care more about the environment. Most participants agree that join into TaiRON increases their sense of achievement. “Regarding the skill of operating technical devices, we can also see a trend that there is some old people learning to use technical devices after joining into this project.” (Ibid.

May 30, 2018).” In other words, Facebook is a great channel to meet the needs of most participants’ different levels of engagement, along with the administrators’ open management style that facilitates network building.

In DRC, the most involved people using digital tools are community representatives and assistance team members, mostly because that is their duty. Therefore, personal responsibility is the most important factor deciding their engagement. The community representatives provide information about the real-time disaster situation, report back when there are disasters, and share activities’ information to invite other community members to take part. At the same time, the assistant team will only use LINE group to convey information. If they need to discuss with the communities, they would gather for discussion, to make the discussions efficient, complete, and avoid misunderstanding. Conversely, the community members seldom use LINE to disseminate information, because they live in the same area and they prefer to gather and share information face-to-face or use the public megaphone system. However, during flooding everyone is busy with his or her own disaster-prevention duties, especially the flood volunteer team. At such times, it is difficult to meet face-to-face because of the bad weather situation, so at this time LINE creates a good channel for instant contact.

In brief, both projects, beyond building an on-line platform, needed to give members clear expectations of what kind of information and discussion would take place, so that they will be willing to continue to follow each group.

Holding Space for Discussion

Both projects minimize anonymity, to make users accountable, and therefore, maintain data quality. Accordingly, TaiRON requires every uploading material to put their real name on record, and in the disaster resistant community, only those who have accounts can reply. However, anonymity “promises freedom and equality” (Gordon & Mihailidis, 2016, p29), therefore, this practice in some ways inhibits freedom in expressing personal opinions. TaiRON, in respect to holding space for discussion, they have four main goals which orient the contents of each discussion (Figure 9). If anyone discusses problems out of scope or in an aggressive manner, admins have the right to delete comments or posts, and to block members (at present, they have not blocked any members). For organizers, admins represent the best way to guarantee a democratic space where people listen and have a voice. The admin are there to moderate tense exchanges and maintain a friendly discussion environment, i.e. deleting hostile comments. Participants also have the "right" to report inappropriate comments/posts. Experienced members can guide the discussion and provide necessary knowledge to explain any misunderstanding.

Figure 9. The four goals of TaiRON that the admins follow for group management. Source: TaiRON Official Website (https://roadkill.tw).

In addition, certain elements help create a better discussion space among a diverse array of members. For example, discussions between pet-lovers and wild-animals-lovers can help them better understand opposite viewpoints. This quality rarely appears in other animal lover Facebook groups in Taiwan. The organizers maintain the open discussions and (Figure 10). Te-En Lin shared that "conflict can improve the quality of member of knowledge – eliminating some animals stereotype (pet-lovers versus wild animal-lovers, snakes)" (Personal Interview, May 23, 2018).

Figure 10. A screenshot of TaiRON participants' discussion on snake stereotypes. Source: collected by the authors.

Interestingly, in Facebook, users can use private message to create a private space for more personal opinions without exposure to other members' judgement. Many participants prefer to privately message the admins or the experienced members to show their respect and avoid unintentional tensions Therefore, in TaiRON FB, although the anonymity is limiting, it helps the information focus, and the discussions occur more effectively and responsibly.

By comparison, DRC, because of the difference in geographic scale, holds discussions primarily during offline, in-person training. LINE is not efficient for discussion about the research and projects because messages are often misunderstood. In this case, researchers and community members meet each other face-to-face rather easily, because they are located in the same county.

Distributed Ownership

Distributed ownership implies that the designer or convener takes time to build capacity of all stakeholders to reproduce or modify designed activities. In these projects, that distribution of ownership emerges from the feedback the organizers acquire to improve the quality of digital tools and respond to the difficulties of participants. In the TaiRON, Facebook provides a good platform for both researchers and participants to collect feedback by surveys such as collecting suggestions for the TaiRON project, annual meeting themes, speakers, or events. The organizers also contacted other researchers on FB for assistance during the web APP development process

> In 2012, a Taiwanese working in New York, whose job was APP development, saw us on Facebook. S/He thought that the way we collect data was too cumbersome. Therefore, s/he contacts us directly, asking what s/he can do to help us. This is how we began the development of our first APP. —Te-En Lin (Personal Interview, May 23, 2018).

Although DRC organizers do not conduct surveys using LINE or APP, they regularly collect feedback from the mobile APPs during training programs. Community members use LINE to learn and ask disaster knowledge. Furthermore, after community members are trained in disaster knowledge, they can use the APP correctly in checking and reporting on evolving conditions. Thus empowered, community members will use the APP to provide disaster-related information for the assistance team. In other words, from being a passive receiver, the community member can transform into a supplier of information. This mutual reinforcement is the highest level of community engagement research in general and eCEnR in particular.

Persistent Input

In both cases, the use social media (Facebook and LINE group) help on the eCEnR's persistent input by keeping mutual benefits between participants and the community members in different ways.

In TaiRON, many participants are eco-lovers, through Facebook, they can connect their real life and virtual life, learning eco-related knowledge and marking new friends who share same interests in the group. What is more important, they want to know how the data they collect has its policy influence. To maintain the persistent input from the participants, TaiRON's organizer disseminating research result and research data application to appreciate the participants' contribution in many ways, including through social media, newspapers, delivering lectures and holding annual citizen scientist meetings. Facebook is an important channel in this case, because the participants would receive message directly in their Facebook group and share this information to their social networks circles. In Chia Hsuan Hsu's survey, a few participants left FB group because “I cannot see my contribution in this project.” More often, participants left because of personal time limitation or technical problems (having difficulties on uploading data).

DRC community members live in a potential disaster area; therefore, their main concern is mitigating the impact to their village and fellow villagers. That being the case, LINE has advantages on reporting new conditions and making the right contacts. LINE can help community members rapidly mobilize and cooperate. It can also help them quickly check messages, asking relevant questions and getting instant replies from the assistance team. For the organizers, they can obtain disaster photos instantly from the communities and can track mobilization in each community, which can help them collect disaster data and better judge the situation (i.e. a potential river breakout or communities most in need) in a very short time.

Using digital tools in different ways, both projects maintain long-term relationships, aligning a given community’s main concern with the wider community of social media participants.

Discussion

Digital tool selection is a dynamic balance between budget, data quality and democracy. Maintaining data quality and managing volunteers and community members without wasting their time or labor are among the biggest concerns when choosing digital tools. Organizers need to consider not only time, budget, data quality, user convenience, but also the changing policies of digital platform suppliers. By comparison, the community members care whether the group's benefits directly answer their needs to maintain their participation. In addition, digital tools should be friendly to the users. Because there is no perfect tool, it is important to have the broadest possible range of options. However, in each case, we still see disagreements between organizers and participants regarding the choice of online tools. The solution for both became a trade-off between data quality and democratic process. With each request for higher data quality, community members requested and required additional training.

Social media facilitates democratic processes and APPs work towards distributing ownership
In both cases, the organizers choose to use APPs to maintain data quality. By operating the digital tools in engaging the projects, they learn specific knowledge related to the research topic (in our cases: disaster-related and ecology-related), which improve their knowledge and awareness. Training community members to operate the APPs, and report scientific data are ways to empower the participants. From the democratic process aspect, it is not only about data accuracy but also about distributing ownership between the researchers and the communities.

With the high penetration in Taiwan compared to other SNS/SNA, Facebook and LINE can improve a research's democratic process in diverse ways. For eCEnRs that have different features and scope of community members, Facebook group is more suitable for projects that collaborates people from different places with dynamic discussions; meanwhile LINE is more suitable for instant information. Both Facebook and LINE group help the community members build their new networks. However, Facebook works better for holding space for discussion, especially with cooperation between admins and participants. In the aspects of distributing ownership, both Facebook and LINE are good for members to learn from each other; yet, Facebook is a better platform for collecting feedback. Finally, yet importantly, Facebook and LINE helped each project's persistent input, responding to concerns, thereby maintaining long-term relationships.

Conclusion

Although TaiRON project started on a shoestring budget, the organizers skillfully used SNS to build networks into a stable and strong community worthy of external support. Besides creating a good space for discussion where netizens may voice their concerns, a transparent and fair cooperation between admins and participants is necessary. Based on the first case, we can conclude that understanding more about the cooperation mechanism would help us to improve the democratic process of a research project.

The second project is an object lesson in making use of government supports in training and empowering vulnerable communities. This project succeeded not only in increasing the adaptive capacity of local villagers in the digital era but also transformed them to agents for disaster risk reduction. We observed in each case some disagreements between organizers and community members about using digital tools. It is worthwhile to gather more case studies about this kind of disagreement. Further research will help us mitigate the harm to democratic processes and find a better balance for choosing digital tools.

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