ABSTRACT

This article discusses how a new APRS service-learning model was implemented in a new service-learning project in the traditional Chinese medicine (TCM) orthopedics curriculums at three Hong Kong institutions. The APRS model adopting flipped learning approach consists of four cyclic stages, including Application, Practice, Reflection and Self-regulated learning. Qualitative and quantitative findings in this study reveal that TCM students gained confidence in applying discipline knowledge/skills and improved in various areas, including cross-cultural competence, communication, problem-solving and collaboration. Drawing evidence from this study, possible factors contributing to positive impacts on student learning in the APRS model are the *strong connectivity* (including clear alignment with programme, profession, institutional missions and traditional Chinese philosophy *xiushen*), *reinforced motivation* (student autonomy and buy in) and *structured organisation* (strong network among participating parties and use of a centralised electronic platform). The APRS service-learning model is a culture-based approach helping students reconnect Confucian *xiushen* to the discipline knowledge and the real-life application in the Hong Kong context. This model may also be applicable to other Asian contexts where the Confucian culture prevails.

Cross-Institutional Service-Learning in Orthopedics Curriculum in Traditional Chinese Medicine Education: APRS Service-Learning Model

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Background of the project

This study is based on to an interinstitutional collaborative teaching and learning project, *Enhancing Orthopedics Curriculums in Chinese Medicine Education by Bringing Theory to Practice.* It involves the schools of Chinese Medicine at three Hong Kong institutions: Hong Kong Baptist University (HKBU), The University of Hong Kong (HKU). The project was supported by the Hong Kong University Grants Committee, under the Funding Scheme for Teaching and Learning Related Proposals.

To implement service-learning in the traditional Chinese medicine (TCM) orthopedics curriculums at the participating institutions, the TCM students, professionals,

community centers, and social workers jointly established a Chinese Medicine Service-Learning Network to provide professional services to elderly orthopedic patients, aiming to relief the currently overladed health care system in Hong Kong and the increasing health care needs in the community (Schoeb, 2016). Throughout the project, students gained the meaningful opportunities to practice essential clinical skills in orthopedics, such as assessing/analyzing medical conditions, preparing health records, designing recovery plans and exercises, and organizing health care activities for the community.

Based on the study, this article discusses the implementation of a unique service-learning model in TCM education in the Hong Kong context, with a particular focus on the TCM orthopedics profession that consists of practical techniques of acupuncture, acupressure, and Tuina massage therapies. This article also analyzes how the student participants perceived the implementation and how it enhanced student learning.

Overview of TCM Education in Hong Kong

Pedagogical Design

Following the problem-based learning (PBL) adoption in McMaster University Medical School in 1969 (Lee & Kwan, 1997), Hong Kong also introduced PBL to medical education (including medicine, nursing, pharmacy, etc.) in 1990s. In medical education, PBL is a student-centred pedagogical approach which makes use of realistic and open-ended medical problems as triggering materials at the start of the learning process (Servant-Miklos, 2019). The problem serves as a vehicle for students to develop problem solving skills and acquire new knowledge (Barrows, 1996). PBL is proved to promote the motivation to learn and the enhancement of academic performance to students (Araz & Sungur, 2007; Finch, 1999; Lee & Kwan, 1997). Thus, it has become one of the core pedagogies in Hong Kong since then (Nandi, et al., 2000).

TCM education in Hong Kong has, instead, adopted a slightly different teaching and learning pedagogy: case-based learning (CBL). In TCM, it is a goal-oriented, faculty-resource intensive teaching method (Rosenbaum, Lobas & Ferguson, 2005) that highlights the training of semi-practical advanced medical knowledge (McLean, 2016), including diagnosis, herbal medicine, acupuncture, and pathology (Chen et al., 2013).

Both pedagogies had been proved effective to motivate TCM students and strengthen their diagnosing skills (Chen et al., 2013; Nandi et al., 2000). However, in the orthopedic course, the medical cases are usually designed to only address a single orthopedic issue (such as joint dislocation or pain), and students are given all the essential information to analyze the clinical cases for the single and correct answers. Since there is a lack of practicing opportunity for students to obtain extra information from real patients, other important attributes of TCM professionals, such as communication skills and empathy which are necessary for building a positive physician-patient relationship, are somehow underdeveloped in the current curriculum.

Constraints in Offering Practicing Opportunities

In view of the knowledge-intensive nature of the TCM subjects, the TCM curriculum at local universities, in general, had been designed in a traditional way,

e.g. five years of pre-clinical study and one year of clinical practicum (5+1). Orthopedics, like many other subjects in TCM curriculum, requires students to apply their clinical knowledge. However, in the curriculum design, authentic practices (with real patients) are only available in the clinical practicum year. Thus, there is a lack of authentic practice opportunity integrated in the course level.

Although TCM has been legally accepted in the Hong Kong health care system since the 90s (Chinese Medicine Council of Hong Kong, 2007), a public TCM hospital is yet to be established to provide training/practicum opportunities. The training practice for TCM students has primarily relied on physician shadowing (observing the physician at work) in local TCM clinics, where TCM students' clinical practices are strictly prohibited, and the compulsory clinical clerkship at the hospitals in Mainland China during the clinical years (Su et al., 2015).

Physician shadowing, though provides opportunities for observing the physician-patient interaction and getting involved in daily operations of the clinics, does not offer any hands-on experience for students to apply clinical treatments on patients. The compulsory clinical clerkship in Mainland China hospital that intends to boost students' practical skills is also not effective. This could be due to two major reasons: different professional standard and language barrier. TCM professionals in Mainland China are legally authorized to prescribe and utilize both Chinese and Western medicine, while this is highly prohibited in Hong Kong (Su et al., 2015). Also, only few Hong Kong TCM students are fluent in Putonghua and so may not always fully understand what they are learning. The lack of first-hand experience with real patients in a familiar medical system also leads to student anxiety about the clinical practicum because of the sense of uncertainty about the clinical situation (Moscaritolo, 2009; Sun et al., 2016).

Bringing Theory to Practice through Service-Learning

Service-learning

Service-learning seems to be able to bridge this gap. Also called reciprocal learning (Sigmon, 1979), service-learning is an effective pedagogy approach in which students work with the community to tackle real problems (or emerging issues) by applying what they learn in the classroom. It is distinguished from other experiential learning approaches by the aim of bringing equally positive impacts on both student participants and the community (Furco, 1996) – a win-win situation for all participants (Salam et al., 2019). In other words, service-learning only occurs when there is a balanced emphasis on both student learning goals and community service outcomes.

Stewart and Wubbena (2015) find service-learning effective in supporting students' hands-on experiences by improving student's performance in three aspects: 1) interpersonal skills; 2) academic and professional knowledge; 3) civic engagement and social responsibility. This constructs a mental schema for future learning in medical education. Research conducted by Lingnan University in Hong Kong also shows an upsurge in subject-related knowledge, communication skills, organization skills and problem-solving skills after a university-wide service-learning program (Chan et al., 2006).

A meta-analysis of the studies on service-learning from 1970 to 2008 conducted by Celio, Durlak, and Dymnicki (2011) reveals that the integration of community service into curriculum enhance student learning outcomes significantly.

They reveal that if adequately integrated in the curriculum, community service can positively enhance five areas of outcomes such as attitudes toward self, institution, civic engagement, social skills, and academic performance (Celio et al., 2011). Chan et al. (2006) also identify that service-learning raises HK students' global awareness and develops their intercultural effectiveness and global citizenship.

Service-learning Model: PARE Model

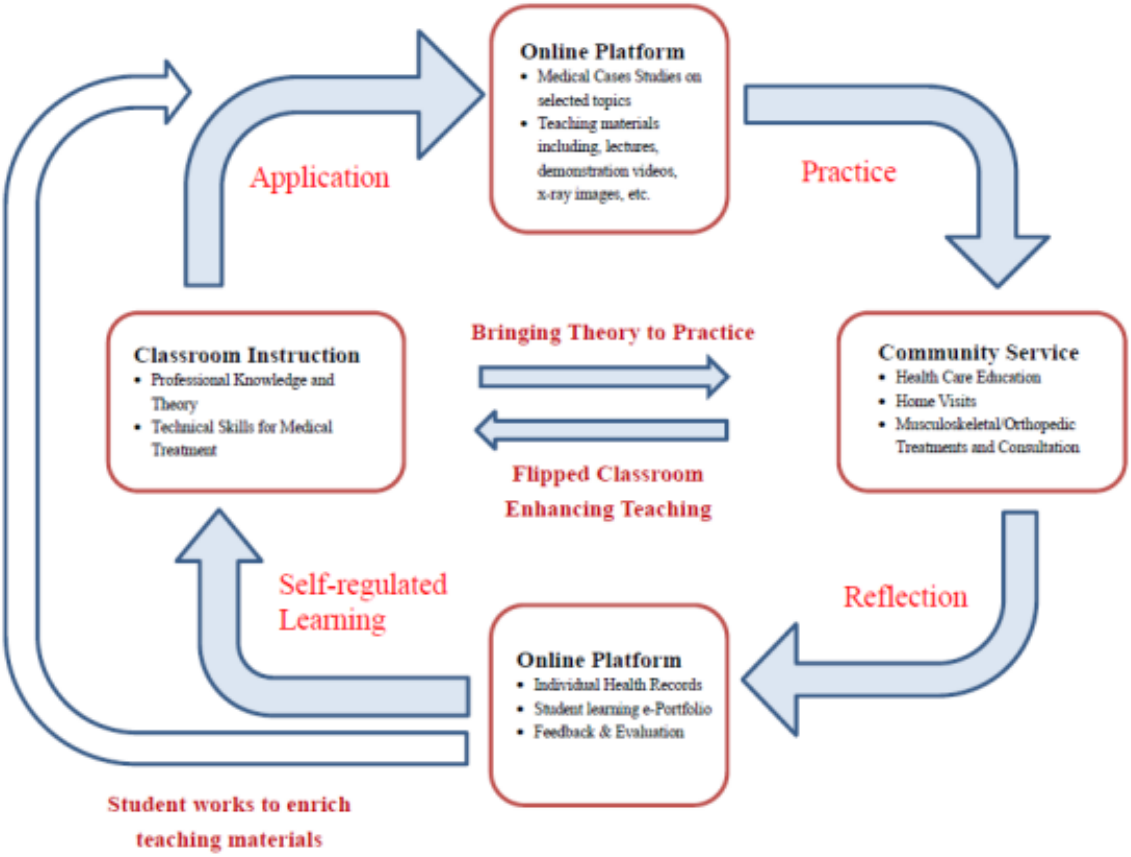
The PARE (Preparation, Action, Reflection and Evaluation) Model, originated from the University of Maryland (Commuter Affairs and Community Service, University of Maryland, 1999) is a widely recognized operational tool for designing service-learning experience in various disciplines. To integrate disciplinary knowledge/skills with practices, the PARE Model embraces the reflective learning stages described by Kolb (1984): concrete experience (Action), reflective observation (Reflection), abstract conceptualization (Evaluation), and active experimentation (Preparation and Action).

A Modified Model for TCM Education: APRE Model

To overcome the constraints in offering first-hand experience opportunities for students in Hong Kong's TCM education, service-learning was trialed in the orthopedics curriculum using a modified service-learning model, APRS, which is developed based on the four-stage structure of the PARE Model and an inspiration from flipped learning.

The APRS is a cyclic model including four stages throughout the service-learning activities: *Application*, *Practice*, *Reflection* and *Self-regulated Learning* (or *Self-regulation*) (See Figure 1).

Figure 1. The APRS model



At the *Application* stage, after learning some basic knowledge and theory in class, student groups (4-5 students each) were tasked to relate their classroom learning to design community services. For example, they arranged health assessment and delivered general health care seminars as a start to understand the needs of the target groups. Based on the interactions with some individual patients in the seminars, students summarized the common issues or needs of the target groups (first-hand observation).

At the *Practice* stage, students were guided to relate their observation with the medical case studies in the online platform (a mobile app, *Orthopedics and Traumatology of Chinese Medicine*) to formulate services plans, including home visits, consultation, health care education. The student groups were paired up with 4 patients, each of whom were visited 3-4 times during the lesson time throughout the semester. With reference to the demonstration videos and medical cases in the mobile app, students practiced their clinical skills during the service under the supervision of TCM professionals.

At the *Reflection* stage, the TCM professionals provided feedback to the student groups and facilitated reflection in an ePortfolio on Google Site. To reinforce their learning, students were also required to revisit the materials through the mobile app to identify any misconceptions or misunderstanding of the theories in the Practice stage. Two peer review sessions were also conducted to guide students to modify their ePortfolios based on peer feedback, before finalizing the ePortfolio for submission.

Students presented their ePortfolios in the class monthly at the *Self-regulated Learning* stage. They engaged in regular evaluations of their service quality and reviewed their professional knowledge/skills through the ePortfolio development. As student groups visited the patients and provided services 3-4 times, the APRS cycle was supposed to repeat a few times. Finally, upon the consent of students and patients, anonymous ePortfolios and patient cases were selected to enrich the teaching materials in the online platform to enhance student learning in the subsequent cohorts.

In this APRS model, the online platform plays a bridging role to connect traditional classroom learning (theory) with community service (practice). Rather than traditionally attending lectures (a group learning space) and doing projects or solving problems at home (an individual learning space), flipped learning inspires teachers to reconsider alternative arrangements for group and individual learning activities and spaces, resulting in active learning (FLN, 2014). In this model, teachers created opportunities for application (e.g., service/practice) in the classroom and moved out the information transfer (e.g., lecture) from the class routine as a result to encourage students to study the materials on their own before class. This arrangement freed part of the class time for social learning (Bandura, 1977) through the interactive activities and immediate peer feedback, which created a group learning space. To further promote active learning in the orthopedics courses, new online teaching materials (including clinical cases, demonstration videos, short lecture videos and short quizzes) were developed as supplementary resources to classroom instruction. These were integrated into a newly developed mobile app which provided students with an individual learning space to study and plan their service. The ePortfolios (on Google Site) also engaged students to consolidate knowledge in an individual learning space.

To conceptualize this APRS model based on the PARE model, there were three major considerations. The first is to minimize teacher's influence on the service activity design and maximize the application and practicing opportunities for students in the service-learning activities by introducing online materials and flipped learning. Thus, the *Application* and *Practice* stages were introduced. Secondly, the *Self-regulated Learning* stage was arranged as the last stage of the cycle to engage students in developing regular practice of evaluating the service outcomes and reviewing their professional knowledge/skills (through the development of ePortfolio). The students self-monitored their classroom learning with the help of the mobile app and then modified plan for the next services. Thirdly, the traditional Chinese philosophy, Confucian *xiushen* (self-cultivation or individual formation) (Yang, 2022), was integrated as a guiding principle for participants to continuously self-regulate throughout the community service (see Discussion).

Methodology and Data Analysis

This project adopts the mixed-method approach to analyze students' perception on their learning experience in service-learning in the orthopedics curriculum. For triangulation, the team produced standardized direct and indirect assessment methods to evaluate students' performance and improvement in different aspects of the service-learning (Wolcott, 1988).

Participants of the Study

A total of 87 pre-clinical Year 4 TCM students who were taking Orthopaedics classes from three local universities participated in the project. All of them were local students. Eighteen TCM teachers from the three local institutions and 40 registered professional TCM practitioners from four local TCM associations participated in the project to provide on-site guidance to the students. The teachers also assessed the students' analysis in students' ePortfolios. Social Workers from seven local non-government organisations (NGOs) and community centres helped with the logistics supports and patient recruitment. They were responsible for assessing students' social responsibility and attitude towards the patients in the service.

Assessment of Students' ePortfolios (direct assessment)

All the participating students submitted an ePortfolio which consists of the patients' health records, details of treatment, self-reflection upon the service and development of practitioner-and-patient relationship. A few rounds of individual presentations on the ePortfolio were held to facilitate peer evaluation. Students were required to raise challenging questions regarding the presentation and provide constructive criticisms to help one another to revise and update the ePortfolios.

TCM teachers and NGO partners assessed the ePortfolios by using two different sets of rubrics, one focusing on clinical knowledge, case analysis and professional skills, and another one focusing on generic skills development including multicultural awareness, citizenship and social justice. The standardized generic rubrics were developed based on HKBU's Graduate Attributes rubrics on Social Responsibility and Problem-solving Skills (https://chtl.hkbu.edu.hk/teachers/obtl/GA-Rubrics.html).

Thematic analysis was adopted to analyse the data collected in the e-Portfolios to identify patterns. The comments provided by the assessors (the social workers and TCM teachers) were also included in data analysis to help explain student learning experience in the project.

Pre- & Post-service Surveys (indirect assessment)

All students completed surveys on their learning experience before and after participating the service. Each survey consisted of 44 items. The first eight items related to the learning outcomes, requiring students to indicate their perception on the importance of and their confidence level in applying the professional knowledge/skills/attitude in orthopaedic diagnosis by giving a rate from 1 to 5 (with 1 being the least important or low confidence and 5 being the most important or high confidence). These items include knowledge of orthopaedics symptoms and signs, medical skills of orthopaedics treatments, caring attitudes and communication skills. The other 36 items adopted the Common Outcome Measurement for Service-Learning (COM) framework which was developed by the Higher Education Service-Learning Network (HESLN) in 2012 and had been widely embraced in the Asian context (Ma, Chan & Tse, 2019). The measurement adopted the cognition-attitude-behaviour model to create nine domains for evaluating the impacts on their whole-person development attributes in general, including (1) self-confidence; (2) general communication; (3) problem-solving; (4) social responsibility or civic engagement; (5) collaboration, (6) self-reflection; (7) knowledge application; (8) empathy or caring attitude; and (9) cross-cultural competence. According to Ma et al. (2019), there are

4 questions in each domain and students were required to give rating on a scale from 1 to 10 (with 1 being strongly disagree and 10 being strongly agree).

Focus Groups (indirect assessment)

Two focus group interviews were arranged with a total of 16 voluntary students to collect more in-depth data to supplement the pre- and post-service questionnaires. The focus group interviews covered areas of (1) students' views of their experience and learning in service-learning; (2) how service-learning supports or impedes students' learning; (3) areas for enhancement of service-learning teaching and *arrangement.*

Findings

Direct assessment on student eportfolios – TCM teachers

TCM teachers in general were impressed by the student ePortfolios. The average score was 85.4 out of 100 (ranged from 68 to 95) which indicated that the majority achieved the learning outcomes of the orthopedics course well. Teacher A commented that "the patient case records and analyses were very detailed and organized. Photos and videos records in the ePortfolios also provided supplementary information about the patients' recovery progress". Through multi-media, the students visualized their thoughts to demonstrate their clinical skills and how they reached a diagnosis. "The reporting quality was even higher than the traditional oral presentations" Teacher B added. Findings from the teachers' comments also suggested that teachers were able to articulate how the students overcame the struggles when they tried to communicate the diagnosis or health care concepts to the elderly who were relatively less educated.

In response to the students' reflections, the TCM teachers gave many positive feedback to acknowledge the professional skills/values students demonstrated. For example, "Your indiscriminate love to patients will guide you to become a pain specialist in Chinese Medicine…", "The actions you took in this atypical case proved that you had learned well and integrated the skills to other TCM subjects…". Another comment "You raised so many questions at a time to challenge yourself after the first service. Take it easy, don't push too harsh…", also indicated that students were eager to improve their performance in the following service.

The teachers' comments also indicated that service-learning experience provided a lot of inspirations to the students. In the overall comments to student ePortfolios, Teacher C highlighted that when students drafted their personal statements in the ePortfolio, they referred to the service-learning experience and "re-considered their current roles as TCM students and then formulated goals for future professional development". Students not just demonstrated professional images as TCM students, but also conveyed their caring attitude toward the patients.

After reviewing the student ePortfolios, all the TCM teachers felt satisfied with the mentorship arrangement in the project. They all identified that students appreciated the mentor roles played by the TCM professionals and expressed their eagerness to work with them again because they realized the needs to follow role models for a long-term development (life-long learning).

Direct assessment on student eportfolios – NGO partners or social workers

NGO partners or social workers graded ePortfolios with the focuses on students' development in Social Responsibility (assessment criteria include multicultural awareness, citizenship, social justice) and Problem-solving Skills (assessment criteria include defining problem, analysing problem, research, applying knowledge, developing solution, implementing plan and evaluating outcomes). These criteria were standardized and adopted at HKBU.

As indicated in Table 1, students in general showed higher achievement in Problem-solving Skills (average score is 3.14 out of 4) while Social Responsibility was still good (3.01). As for Problem-solving Skills, the students did well in applying knowledge (3.32) and other six criteria (range from 3.07 to 3.14). The results suggested that students were able to apply knowledge they had learned previously from different sources (such as lectures, online materials/cases, peer discussion on ePortfolio, etc.)

In Social Responsibility, the average score of the multicultural awareness criteria was 2.96 (which was also the lowest score among the ten assessment criteria). It suggested that students generally needed more exposure to real patients with different cultural or educational background. The assessors observed that students tended to act based on their preconception about the elderly and hence took longer time to establish mutual trust. Although some students were very attentive to the patients' needs in health care, the accessors suggested that students should pay more attention to two-way communication; for example, they should spend time understanding the patients' daily routines or medical history and inviting them to share their views on the diagnosis and treatment.

Table 1: Student ePortfolio assessment graded by NGO partners or social workers

Assessment rubrics and criteria	Average score (rate from 1 to 4)
Social Responsibility	**3.01**
Multicultural Awareness	2.96
Citizenship & Civic Engagement	3.04
Social Justice	3.04
Problem-solving Skills	**3.14**
Defining Problem	3.11
Analysing Problem	3.11
Research	3.11
Applying Knowledge	3.32
Developing Plan/Solution	3.11
Implementing Plan/Solution	3.07
Evaluating Outcome	3.14

Overall, both TCM teachers and the assessors acknowledged students' achievement in service learning and appreciated their efforts to reflect deeply. A major finding here is that ePortfolios, as a direct assessment measure, did not just provide opportunities for students to showcase their learning achievement (including professional knowledge and skills), but was also an integrated platform to demonstrate how student personal values and thoughts developed and how their professional identities were established in the four stages: Application, Practice,

Reflection and Self-regulated learning. The strategy of engaging TCM students in the regular reflective practice throughout the service-learning project also facilitated a cyclic learning pathway for students to get across the four-stage APRS model.

Indirect measurement: student surveys and focus groups

Table 2 summarizes the results of the pre-/post-service student surveys (indirect measurement). Positive differences were identified in students perceived confidence and competence (including communication, problem-solving, social responsibility, collaboration, reflection, knowledge application, empathy and cross-cultural competence) after participating in the service-learning project.

The original design of the research was to perform a paired t-test to examine any statistical significance. However, because some identifiers of individual participants were lost in the data collection, it was impossible to perform a paired-test. Though the survey findings below were limited to the discussion around positive or negative differences, these findings were consistent with the relevant quotes and findings in the focus groups and student ePortfolios.

Table 2: Results of the pre-/post-service student surveys

Item no.	Item descriptions	Pre	Post	Diff
1. Importance of discipline knowledge/skills/attitudes (1=least important to 5=most important)				
1.1	Knowledge of orthopedics symptoms and signs	4.6	4.6	0.0
1.2	Medical skills of orthopedics treatments	4.6	4.5	-0.1
1.3	Attitudes of caring patients	4.5	4.4	-0.1
1.4	Communication skills with patients	4.5	4.5	0.1
1.1 to 1.4	**Average of importance of discipline knowledge/skills/attitude**	**4.6**	**4.5**	**-0.1**
2. Confidence in using discipline knowledge/skills/attitudes (1=least confident to 5=highly confident)				
2.1	Knowledge of orthopedics symptoms and signs	2.9	3.5	0.6
2.2	Medical skills of orthopedics treatments	2.8	3.4	0.6
2.3	Attitudes of caring patients	3.7	4.2	0.5
2.4	Communication skills with patients	3.4	4.0	0.6
2.1 to 2.4	**Average of confidence in using discipline knowledge/skills/ attitude**	**3.2**	**3.8**	**0.6**
3. Agreement of the experience, action and opinion (1=strongly disagree to 10=strongly agree)				
3.1	I am aware of my personal strengths and weaknesses	7.1	7.6	0.5
3.2	I am open to new experiences and willing to take risks and accept challenges	7.7	7.7	0.0
3.3	I often seek out challenging opportunities that test my skills and abilities	6.8	7.5	0.7
3.4	I am confident in my abilities	6.0	6.7	0.8
3.1 to 3.4	**Average of self-confidence**	**6.9**	**7.4**	**0.5**
3.5	I feel comfortable to present my ideas in front of others	6.3	7.1	0.8
3.6	I know how to communicate my ideas in situation that is new to me	6.4	7.2	0.8
3.7	I understand the importance of participating in group discussion with others	7.5	7.7	0.2
3.8	I feel confident in communicating ideas precisely with people	6.4	7.3	0.8
3.5 to 3.8	**Average of general communication**	**6.7**	**7.3**	**0.7**
3.9	I feel confident in identifying a problem	6.6	7.1	0.5
3.10	I feel confident in tackling problem	6.5	7.0	0.4
3.11	Before I solve a problem, I gather as many facts about the problem as I can	6.8	7.5	0.7
3.12	I go through the problem-solving process again when my first option fails	7.0	7.6	0.7
3.9 to 3.12	**Average of problem-solving**	**6.9**	**7.2**	**0.3**
3.13	I am aware of the important needs in the community	6.7	7.5	0.8
3.14	I am or plan to become actively involved in issues that positively affect the community	6.6	7.3	0.7
3.15	I feel a personal obligation to contribute in some way to the community	6.8	7.5	0.6
3.16	It is my responsibility to help improve the community	7.3	7.4	0.1
3.13 to 3.16	**Average of social responsibility**	**6.9**	**7.4**	**0.6**
3.17	I am able to remain calm and reasonable even when conflict among group arises	7.2	7.5	0.2
3.18	I cooperate successfully with other students in a variety of situations	7.2	7.6	0.4
3.19	I notice and compliment accomplishments of others	7.2	7.6	0.4
3.20	I participate effectively in group discussions and activities	7.0	7.5	0.5
3.17 to 3.20	**Average of collaboration**	**7.2**	**7.6**	**0.4**
3.21	I am assertive and independent	7.0	7.4	0.4
3.22	I am motivated to learn, participate and achieve in school	7.1	7.7	0.6
3.23	I believe self reflection can improve myself	7.5	8.0	0.5
3.24	I will evaluate myself after completing a task	7.2	7.7	0.4
3.21 to 3.24	**Average of self-reflection**	**7.2**	**7.7**	**0.5**

3.25	I am aware of the importance of evaluation and outcome with knowledge learned in class	7.3	7.6	0.3
3.26	I feel confident in applying knowledge in my areas of study	6.8	7.2	0.4
3.27	I understand the needs to adapt my theoretical knowledge in various real-life situations	7.5	7.6	0.2
3.28	I learn course content better when connections to real-life situations are made	7.7	7.9	0.2
3.25 to 3.28	**Average of knowledge application**	**7.3**	**7.6**	**0.3**
3.29	I am aware of the thoughts and feelings of other people	7.7	7.9	0.2
3.30	I believe that the world would be a better place if prejudices no longer exist	7.5	8.1	0.6
3.31	I feel comfortable building relationship with people from different background	7.2	7.7	0.6
3.32	I believe that taking care of people who are in need is everyone's responsibility	7.3	7.8	0.5
3.29 to 3.32	**Average of empathy**	**7.4**	**7.9**	**0.5**
3.33	I am keen to learn more about people from other cultures	7.6	7.7	0.2
3.34	When I interact with people from other cultures, I try to understand their behaviours, perceptions or feelings in the context of their cultures	7.4	7.8	0.5
3.35	I believe that paying attention to the body language of those from other cultures would allow me to understand more about them	7.5	8.0	0.5
3.36	I am interested in making friends with people of different cultural background	6.6	6.9	0.3
3.33 to 3.36	**Average of cross-cultural competence**	**7.3**	**7.6**	**0.3**

<u>Self-confidence and application of discipline knowledge, skills and attitude</u>

Large positive differences in the items 2.1 to 2.4 seemed to suggest that students felt quite confident in using the discipline knowledge/skills/attitude in the service. Especially for the knowledge of orthopedical symptoms and signs (item 2.1), the average confidence level increased from 2.9 to 3.5 with 1 representing “least confident” and 5 representing “highly confident”. Similar observations were also found in students’ ePortfolios in which many students reported that they were able to identify relevant symptoms and signs for diagnosis based on the knowledge learned from class lectures and the mobile app. The results of other competence domains in the survey, including Self-confidence (items 3.1 to 3.4) and Knowledge application (items 3.25 to 3.28), were also consistent with this observation.

Student A reported a relevant experience in the focus group: “the year-long service learning has enhanced my diagnostic skills in orthopaedics…; for example, I examine patients’ condition by different approaches, rather than only rely on the symptoms they reported. That helped me develop various practical skills to do diagnosis”. He further elaborated that the service-learning provided a good opportunity for students to extend learning from the book knowledge to clinical practice and “more importantly it helps me transit from learning in discrete subjects to an integrated and authentic application”.

Communication with peers and TCM professional

While students gave high scores to all the items in General communication skills (items 3.5 to 3.8), they perceived larger differences in the items regarding presentation, communicating ideas in new situation and conveying ideas with layman

people (items 3.5, 3.6 and 3.8). Student B in focus group also explained that “while we were able to communicate with peers/mentors with the technical terms, we were also aware of the needs to translate these terms into the language that patients could understand… We made extra efforts (using different analogies) to ensure that the elderly understood our explanation and instruction.”

Student C further related the communication skills with empathy. “We learned some communication strategies from the TCM professionals when they demonstrated how to talk with the patients… Good communication skill doesn’t only help us collect extra information for diagnosis, but also shows our caring attitude [empathy] and build trust with them.”

Social responsibility

Students had high ratings for the Social Responsibility items, especially items 3.13, 3.14 and 3.15. The analysis of the focus group transcript suggested that students also recognized the first-handed expectations on TCM students from the elderly and realized the responsibilities a TCM practitioner should bear.

There is an interesting view from Student C who mentioned that “As TCM students, I feel that there is very little we can do to improve the health care system now, because TCM is currently less popular compared with the western one… However, we need to work in the reality though it is not an ideal situation”. In fact, increasing studies reveal that TCM provides effective recovery solutions for the COVID patients in the mainland China. In view of the limitations of the existing Hong Kong public health care systems (e.g., prolonged waiting time for non-emergency patients who need health care), students felt strongly that TCM could offer alternative choices to relief the overwhelming health care needs. “I believe that TCM has strengths in long-term health care service, which might be a solution to this challenge in the system” (Student C).

Problem-solving and collaboration skills, and self-reflection

Student reflected that the service-learning activities offered them the opportunities to develop their problem-solving and collaboration skills. Student D recalled the experience that “we took turns to take different roles: observer, recorder, doing diagnosis and giving peer feedback at various stages of the activities”. This arrangement encouraged students to have meaningful conversations or discussions throughout the service. The presence of the TCM professionals, in addition, allows students to seek immediate support/enquiry in the service. Student E explained, “this arrangement created a faster pace of individual learning cycle (self-reflection). My struggle was directed to my peers or teachers immediately onsite and I could consolidate the learning in the later individual reflective exercise… I could remember the knowledge better”.

Student E reflected that “I used to be a person who usually omitted the proper steps to analyse a situation and jumped to conclusion. In this service, I was frequently and nicely reminded of the proper procedure through different means, such as the surveys, peer feedback, assessment… That really helped me develop a more systematic thinking habit.”

Empathy and cross-cultural competence

In the post survey, students generally gave higher average scores to the items regarding Empathy (7.9) and Cross-cultural Competence (7.6), compared to other items. Student F explained in the focus group that "I realized that in my first visit, I put too much emphasis on the chronic pain they were suffering… too much focus on producing recovery advice to the patients without considering the feasibility in their living environment… because I did not spend enough time to understand their feeling, interests or even emotional needs".

She continued, "in fact, reading their body language and even observing the setup in the living room give us a lot of clues to understand their perception and beliefs… In some cases (such as the elderly living alone), what they needed was simply fundamental: someone who are willing to listen to their stories and to recognize the achievement in their early life… Respect and acknowledgement are probably the very first medicine/treatment for them in this service."

Students developed empathy and cross-cultural competence throughout the reflection on the interaction with the patients. It suggested that this service-learning did not just enhance professional skills/knowledge, it also helped students to develop appropriate beliefs/values in the TCM profession.

Discussion

The above findings in the indirect measures (pre-/post-service student surveys and focus group) echoed those findings in the direct assessment on student ePortfolios by TCM teachers and NGO partners mentioned earlier. Students gained confidence in applying discipline knowledge/skills and improved in various areas, including cross-cultural competence, communication, problem-solving and collaboration. And through self-reflection, they also developed greater sense of social responsibility and empathy. These findings are consistent with the meta-analysis of service learning's effect on student learning (academic, personal, social and citizenship outcomes) by Conway et al. (2009) and Celio et al. (2011).

Based on this study, it is suggested that connectivity, motivation and organisation are the three key factors contributing to student success in the suggested APRS service-learning model.

Strong connectivity

Apart from the fundamental connection with the community, the service-learning activities in this study also connected with the students in four different dimensions: 1) *curriculum and programme*: integrating to academic curriculum structure and content (Furco, 1996), 2) *professional skills and values*: allowing students to practice and reflect on the discipline skills and values (Bringle & Hatcher, 1999; Huda et al., 2018), 3) *institutional mission*: aligning with the university's commitment to the community (Bringle & Hatcher, 2000), and 4) the traditional Chinese philosophy, Confucian *xiushen*: expanding self-cultivation to the society (Yang, 2022).

In traditional China, *xiushen* represents "the way of being human" (Tu 1979, p. 238), striving to be a good person. This notion of individual formation is developed in terms of the Confucian anthropocosmic worldview (Lu & Jover, 2018; Tu 2013), representing the intention to expand cultivation from individual boundary to *family* (including teachers and peers), society, state and eventually to *tianxia* (the world

below heaven) for a “Great Harmony” (Yang, 2022, p. 1165). It views the world as a harmonized whole while individuals and society are parts of the whole.

With a strong alignment with the *xiushen* philosophy, the APRS model offers students the opportunities, in the Reflection and Self-regulation stages, to internalize professional values (developing individual cultivation). As they share their portfolios for teacher/peer feedback in these stages, they are helped to formulate and cultivate professional identifies with their teachers/peers (expanding to *family*). After the first-cycle Reflection, the second learning cycle begins, and students further apply and practice professional knowledge/skills in the community in the Application and Practice stages (expanding to society).

Reinforced motivation

Students as Partners

In this study, the TCM students were considered as partners, rather than only learners. Student as Partners (SaP) in teaching in higher education, is a pedagogical approach that challenges the traditional power relationship between students and teachers, suggesting that students could work with teachers, to improve teaching and learning experiences because student voices are equally important (Felten et al., 2014; Mercer-Mapstone et al., 2017). In such a partnership, student partners were empowered to take control of their learning. They could make significant decisions like what specific activities (home visit, consultation, or health care education) to hold, how to carry them out and when to do them. This arrangement allows student participants to develop a greater sense of control of their learning process. This flexible arrangement created a positive learning environment that reinforced Autonomous Motivation (Hagger et al., 2014). The detailed arrangements of the service in this study were self-determined by the TCM students.

Student buy-in

The pre-survey results showed that TCM students generally experienced low confidence in using discipline knowledge/skills (mean score: 3.2 out of 5) because of the lack of practicum opportunities in the curriculum in the Hong Kong context. They need authentic experience of working with TCM professionals and communicating with the local social workers and patients. Thus, when the students were informed that they could have this additional exposure, they were excited in participating.

The project team gained student buy-in by emphasising the “serving to learn” and “learning to serve” attributes. It basically went through four stages: Exposure, Persuasion, Identification and Commitment (Cavanagh, et al., 2016). Students were encouraged to participate in small groups so that the new exposure and workload were considered manageable for them (initial exposure). TCM professionals and teachers debriefing sessions also helped students to relate the lived experience with the course materials and persuaded them by identifying the benefits to student learning (persuasion). Students reflected and identified the small changes they had brought to the patients or community in their ePortfolios (identification). Finally, students were given opportunities to tailor follow-up services and develop health records for the patients (commitment). This arrangement allows students to truly buy in the civic education (Battistoni, 2001; Westheimer & Kahne, 2003). In this case, students joined the Chinese Medicine Service-Learning Network and contributed to developing solutions to an emerging issue in Hong Kong, i.e., offering health care

services to the non-emergency elderly patients who have been waiting for years in the public health care system.

Structured organisation

Chinese Medicine Service-Learning Network

In view of the challenges in organising inter-institutional service-learning activities for TCM curriculum, the project team first established the Chinese Medicine Service-Learning Network to operate and support the service-learning activities. The Network gained wide support and hence consisted of the Chairperson of Hong Kong Registered Chinese Medicine Practitioners Association, curriculum directors from the TCM schools at the three participating institutions, representatives from NGOs, and student representatives. The Network provided a discussion platform for the orthopedics course directors to re-align the curriculum assessment, course schedule and prerequisites among the institutions, with input from other stakeholders. Furthermore, the orthopedics course directors at HKBU and HKU considered this implementation an opportunity to review the assessment design. Official approvals of the service-learning implementation in the TCM curricula were obtained afterward. In addition, the Network provided an effective operation platform for the NGOs to facilitate the logistic arrangement to maximize the benefits to the communities. By the end of the project, over 1,300 sessions of services were provided to the elderly in five districts in Hong Kong.

Use of a centralised electronic platform to facilitate flipped learning

The development of a mobile app and the adoption of ePortfolios assisted teachers/students to transition from a traditional classroom learning to a flipped learning approach (service-learning APRS model) by sharing course materials, student reflection and peer/teacher feedback effectively. The mobile app also played a significant role in motivating students to learn new knowledge (video recordings), review medical cases (case studies) and self-evaluate learning progress (formative tests). The ePortfolio, instead, provides a one-stop platform for students to nurture their professional identity via reflection and develop anonymous health care records to create additional course materials. Feedback from peers and teachers were also easily captured and utilized. It is believed that the establishment of a centralized operation Network and the use of an electronic platform were crucial to the success of this project study.

Conclusion

The findings in this study reveals that TCM students gained confidence in applying discipline knowledge/skills and improved in various aspects, including cross-cultural competence, communication, problem-solving and collaboration. Through self-reflection, they also developed a greater sense of social responsibility and empathy which are essential for TCM students to develop their professional identities. The suggested APRS model, adopting a flipped learning approach, could be effective for Chinese Medicine education in the Hong Kong higher education context. Evidences from this study show that possible factors contributing to both student success and positive impacts on student learning in the APRS model include the *strong connectivity* (including clear alignment with programme, profession,

institutional missions and traditional Chinese philosophy *xiushen*), *reinforced motivation* (student autonomy and buy in) and *structured organisation* (strong network among parties and use of etools).

The concept of Confucian *xiushen* had been included in Hong Kong secondary school Chinese Culture curriculum for decades. However, it was only addressed in a theorical way and eventually disconnected from the modern society. This study suggests that service-learning through the APRS model is a reasonable way to help students reconnect the Confucian concept *xiushen* to the discipline knowledge and real-life application in Hong Kong context. This model may also be applicable in other Asian contexts where the Confucian tradition plays a role in education. Further study on its implementation in other disciplines could be a way forward.

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