

Project Report

Students' Experiences with Interprofessional Service-Learning Global Health Education Pilot Program in Ghana

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Abstract: Interprofessional service-learning programs can help to break down the education and training silos between public health and health care in the United States. This paper describes the development and implementation of one such program between the University of Massachusetts, Amherst, School of Public Health and Health Sciences, Bay Path University Physician Assistant Program, and the Wa-West Health District in Ghana. The program brought together Master of Public Health students and Physician Assistant students to complete an applied practicum and training experience in a low-resource community that faces significant health care and public health delivery challenges. In 2017 and 2018, nine students participated in the two-year pilot program, UMass Amherst Interprofessional Integrated Service Learning and Community-Based Participatory Collaboration. Students completed projects designed by Ghanaian health officials over two summers in direct collaboration with the communities. Findings from the evaluation of the pilot program revealed that though the students faced some challenges with the program, such as language barriers, transportation issues due to poor roads, and difficulty scheduling meetings while completing their projects in Ghana, the majority described their experience as positive and were satisfied. Some expressed the idea that their experiences were something that they could incorporate into their current and future practices. In addition, they reported that interprofessional communications and collaborations were effective. Recommendations are offered to address the program's challenges for its continuation and formalization.

Keywords: interprofessional education; international service learning; community collaboration; public health; students experience



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1. Introduction

In the United States (U.S.) today, there exists a well-documented gap between health care delivery and the practice of public health. The silos between education and practice have been the subject of intense scrutiny in the past decade and there have been numerous calls to break down these silos and integrate the two fields [1,2]. The U.S. officially recognized the value of interdisciplinary education as a means of addressing its health care crisis in 2009 [3,4]. Additionally, the Interprofessional Educational Collaborative (IPEC) calls for educators and institutions to train students in a way that fosters collaboration and encourages a team-based approach, and to break down the silos that exist between professions [5]. In 2001, the Institutes of Medicine (IOM) called for changes in how health-care professionals are educated, and specifically, called for academic institutions to work with the communities in which they serve [6]. The IOM also called for an increase in the collaboration between healthcare professionals as a means to promote health, which could lead to an increase in cultural competency for all health care professionals [7,8]. Internationally, numerous organizations have called for such changes to health care delivery systems.

Specifically, the Commission of Health Professionals for the 21st Century has called for changing instructional design and for increased collaboration between international health professionals, with the goal of delivering socially accountable, team-based health care. The organization has also promoted the development of international collaborations, where international colleagues could meet and collaborate on educational reforms and develop new and innovative education strategies [2].

One method used to address the gap is International Service Learning (ISL) paired with Interprofessional Experience. ISL is a model of education where students and communities partner work to build a reciprocal relationship in which both partners learn from each other [9]. ISL programs are specifically designed to create and sustain a working partnership between the educational institution and the community in which it serves, and three pedagogical domains are included in all: service learning, study abroad, and international education [9,10]. By its very nature, ISL requires experiential learning; participants do not learn in a classroom, they go out into their communities and learn by doing. This process forces interaction with a variety of issues, offers multiple learning opportunities, and crosses cultural barriers in a way that classroom instruction cannot provide [9]. One of the top concerns in developing a successful ISL program is cultural competency. How does the program ensure that partners are able to not only engage with each other, but also maintain effective communications over time, especially when the program involves collaboration between low-resource and resource-rich countries? By combining experiential learning with international service and interprofessional collaborations, a program can effectively address the cultural competency [9]. Programs designed using this model may be most effective at creating sustainable impacts on both the students involved and in the communities that they served.

A review of the recent literature found the combination of interprofessional experience and ISL has been implemented previously. Most programs occurred in South American countries and reported on service learning centered on clinical care (medicine, dentistry, physician assistant, occupational or physical therapy, and geriatric care), health education, or volunteerism (See Table 1). No program solely addressed the public health needs of the community as the primary means of engagement, and none were developed in Western Africa.

Table 1. Review of the literature.

Authors and Year of Publication	Healthcare Groups	Country Site	Service-Learning Offered: Clinical	Service-Learning Offered: Health Education	Service-Learning Offered: Other
Bentley et al., 2014 [11]	MD, DMD	Bolivia	Teeth cleaning and wound care	-	-
Boysen et al., 2016 [12]	Chiropractors	Fiji, Vietnam, India, Honduras	Clinical care	-	-
Boysen, Salisbury and Lawrence, 2018 [13]	Chiropractors	Fiji, Vietnam, India, Honduras	Clinical care with public health	Patient Education	Access to health care
Brown, 2017 [14]	Nursing	Belize	Nursing	Health Promotion and PH Nursing	-
Chakraborty and Proctor, 2019 [15]	Speech Language Pathology and OT	Nicaragua	Clinical care and observation	-	-
Fell, Kennedy and Day, 2018 [16]	MD, RN, Allied Health	Trinidad	Clinical care	-	-
Foster and Pullen, 2016 [17]	Nursing and Physical Therapy	Dominican Republic	Clinical care	-	-
Cuellar et al., 2016 [18]	MD	Nicaragua	Clinical care	Courses	Language and leadership development
Johnson and Howell, 2017 [19]	Pharmacy, MD, PT, Nursing	Ecuador	Clinical care	-	-
Kaddoura et al., 2014 [20]	Nursing and Dental Hygiene	Morocco	Oral health and wound care	-	-

Table 1. Cont.

Authors and Year of Publication	Healthcare Groups	Country Site	Service-Learning Offered: Clinical	Service-Learning Offered: Health Education	Service-Learning Offered: Other
Main et al., 2013 [21]	Nursing	Belize	-	-	Service-learning course
Mandich, Erickson and Nardella, 2017 [22]	MD, RN, and Pharmacy	Brazil	Clinical care	-	-
Martinez-Mier et al., 2011 [23]	MD, DMD, RN, Social Work and Public Health	Mexico	Medical and dental care	-	-
Neal et al., 2017 [24]	Health Sciences	Nicaragua	Geriatric care	-	Education research
Noonan, 2018 [25]	Pharmacy, PA, OD, and PT	Honduras	Pain control	-	-
Peckak et al., 2013 [26]	PT and Speech pathology	Guatemala	Clinical care	Communication	Wheelchair use/seat modification
Riner and Becklenberg, 2001 [27]	Nursing	Nicaragua	-	Prenatal classes	Communication, scholarship
Smith and Tremethick, 2014 [28]	Nursing	Honduras	Clinical care	-	-

This paper describes the development of one interprofessional ISL program in Ghana, Western Africa, with a sole focus on public health, beginning with the planning and development, implementing the pilot program, lessons learned, and the future of the program.

2. Materials and Methods

2.1. Program Idea Inception

In December 2016, a senior staff member with the Professional Programs at the School of Public Health and Health Science (SPHHS) at the University of Massachusetts Amherst (UMass Amherst) met with an SPHHS alumnus who is a practicing Physician Assistant (PA) and Professor, from another institution in Western Massachusetts, to discuss the need for an interprofessional approach to global population health. The previous fall SPHHS had launched a Graduate Certificate in Global Health and the students were requesting UMass sponsored opportunities abroad. From the discussions it became clear that local PA education did not include sufficient public health education and there was a high demand in both the PA program and within SPHHS for global opportunities. An idea was formed that if we brought these two populations together, they could learn from each other and effectively bridge the gap between the two. Most importantly, this collaboration would occur early in their professional careers, thereby informing their practice from the beginning, with the hope that they would incorporate public health practice as a new model for addressing population health in their communities. In addition, it was agreed that if this interprofessional collaboration could be carried out in an international setting, a level of cultural competency could also be achieved, through the ISL pedagogical approach. The meeting resulted in the creation of an applied practicum and training experience where the SPHHS and PA students came together and worked in cooperation with an international community that faced significant health care delivery and public health challenges. The program was entitled the UMass Amherst Interprofessional Integrated Service Learning and Community Based Participatory Collaboration.

The goal now became finding a willing international partner whose community met the criteria. In spring 2017, a likely partner was identified, the Wa-West Health Administration of the Ghana Health Service (GHS), located in Wa in the Upper West region of Ghana. UMass Amherst was contacted by the district health directorate, which expressed interest in working with the program. Over the next four months, the two parties met several times, as the district health directorate described the needs of the district and how UMass could partner to assist in meeting some of those needs. Eventually, the district health directorate put together a document which described both the district and its greatest health challenges. Specifically, four areas were highlighted with the first and most pressing issue of family planning. The district had a family planning coverage goal of 60%, and the actual value

was under 50% for most communities, with the Wechiau community recording the lowest (19%) and a district average coverage of 35.5%. This lack of family planning coverage has led to increasing teen pregnancy rates in the district. Between 2013 and 2016, the rate of teen pregnancy rose 31% [29].

The second area of concern was the rate of home deliveries. While many women register their pregnancies, up to 30% of women deliver outside of health facilities. Since 2016, the rate has been improving but the district had a goal of 60% skilled birth deliveries and was only averaging 40.5% [29]. The third area of concern was the Community Emergency Transport System, or CETS. CETS is a program aimed at improving health care delivery in Wa through the establishment of a fund to pay for emergency transportation. Community members register with the service and then contribute to a fund. The fund can be accessed by any contributing member of the community in times of an emergency. The goal is to improve the accessibility to care, and ensure timely and effective referrals of clients to prevent delays and avoidable deaths, especially for women in labor. The secondary goals are to reduce the costs of transportation and improve its availability in remote areas. The program required a formal evaluation that could help determine the strengths and weaknesses and areas in need of improvement.

The final area of concern was the need for a formal evaluation of the Community Health Action Plan (CHAP). Health care is delivered in rural areas of the district by the deployment of community health nurses who have been trained as community health officers. Part of their responsibility is to conduct regular meetings with community members to help plan and solve their own health problems. These meetings are carried out on a quarterly basis, and they needed a proper evaluation to assess their effectiveness.

2.2. Program Site

The program site was the Wa-West district. The Wa-West district is one of the eleven administrative districts of the Upper West Region of Ghana. It is located in the northwestern part of the region and stretches from latitude 9°40' N to 10°10' and from longitude 2°20' W to 2°50' W, covering a total land area of approximately 1458 square kilometers [30]. It has Wechiau as its administrative capital. The district borders with Sawla Tuna Kariba district to the south, Wa Municipal to the east, and Nadowli Kaleo district to the north, and the entire west border is shared with Cote D'Ivoire. The district lies within the general prevailing semi-savanna vegetation and tropical climatic conditions in the region. There is a single rainfall season that falls between May and October, followed by the prolonged dry season (harmattan) extending from November to April. There are eighteen communities that border Burkina Faso, which also makes them prone to diseases from that country. Sharing a boundary with the Sawla-Tuna-Kalba district in the Northern Region is another challenge, as it is also a new district and even more less endowed with health facilities. The district has a population size of 95,592 [31] and is rural. Healthcare in the district is managed by the Ghana Health Service Wa-West District Health Directorate. It has 1 district hospital, 7 health centers, 12 Community Health Improvement Services health posts (also referred to as CHIPS compounds), and 2 private clinics. One major challenge faced by residents of the district is the poor transportation system, which limits access to timely healthcare.

2.3. Program Participant Recruitment

The MPH student participants were recruited from the UMass Amherst SPHHS Online Master of Public Health in the Public Health Practice degree program. The students average 36 years of age and come from all of the 50 United States, Canada, and the rest of the world. They are mostly middle career professionals in health care or one of the public health fields, and bring an average of 10 years of professional experience upon entering the degree program. As part of the degree, all students are required to complete a 200 h field work course or practicum. This is a credit-bearing course, which requires the students to go out into their communities and work on a public health focused issue. Students have the freedom to arrange the practicum according to their career goals and, at present,

approximately 10% choose a global-health-focused practicum, either with a stateside non-governmental organization (NGO) focused on global health or they travel abroad on their own. The PA students were recruited from Baypath University, a small women's college in western Massachusetts. PA students were informed that they would be able to meet their international PA equivalents in Ghana, learn from Ghanaian clinicians, engage with public health students, and observe how a low-resource country implements public health in its health care delivery system.

2.4. The Pilot Program: Year One

The planning for the first year began in late December 2016, when the final list of potential practicum placements was received from Wa. The list, along with a detailed recruitment letter, was sent to the UMass SPHHS student listserv. PA students were recruited through announcements to classes and email communication between the Professor and students on an individual basis. PA students who expressed interest in Global Health rotations were identified. The goal for the first year was to recruit no more than 3 MPH students and up to 3 PA students. By January of 2017, we had recruited 2 PA students and one MPH student. From there, monthly planning meetings were scheduled, where various topics were addressed. These topics included logistical information on traveling to Ghana, immunizations, passport and visa requirements, and what to expect while in Ghana. Additionally, the students met with the practicum advisor to begin the planning process. Students were informed that they should plan on the actual project changing as it developed and to be open to this change. Over-planning was discouraged. As a side project, the district health directorate requested an amount of financial aid. Health care delivery in the district is mainly carried out on motor bike, and at the time of the project, the district had 80 motor bikes, but only 25% actually worked. The initial desire was to raise funds to purchase new bikes. The PA students organized a Go-Fund-Me drive, and by the time the trip commenced, the students had raised approximately USD 2000.00. Upon arrival in Wa, however, it was agreed that a better use of the funds raised was to repair as many bikes as possible and purchase just three new ones. Additionally, funds were used to purchase needed computers and a projector.

For the first year, in collaboration with the district, the chosen project was to research the high teenage pregnancy rate and the associated contributing factors. Additionally, the MPH student conducted a feasibility study on the program itself, aimed at determining if the collaboration was properly developed and if the program needed to be redesigned.

The trip began in late June 2017 and ended at the end of the second week of July. Students travelled on their own to Accra and met up either the first or second evening, then flew to Tamale, Ghana, and then to Wa, as a group the following day. The first day in Wa, the group met the district health directorate and participated in a presentation on the overview of the health situation and health care delivery in the district. In the following next 2–3 weeks, the group visited villages and health centers in the district to implement the projects, which involved the planning and implementation of focus groups with currently pregnant teenagers, teenage mothers, or their mothers. Additionally, a focus group including girls still in school, but not those pregnant or mothers, was conducted. This served as a way of assessing protective factors in preventing teen pregnancy. These focus groups were organized by the health care center staff and the community health officers (CHOs.) The two PA students assisted the public health student and spent time with Ghanaian PAs in their community health centers, where they learned about common medical conditions seen in Wa West and how they are treated. They also had the opportunity to learn more about how health care is delivered in this rural region, with tours of local hospitals and rural community health facilities. The length of the trip varied by participant as we wanted the students to be able to stay as long as they felt they needed to gain the most from their experience. Most spent two weeks, with some staying the third week.

2.5. The Pilot Program: Year Two

Year two planning began in late fall 2018 with the delivery of the areas of concern document from the district health directorate. With many of the same concerns, it was decided that students should choose one of the initial projects outlined in the original document presented in 2017. A Ghanaian-American professor joined the program's staff, with the goals of strengthening the collaboration and supporting the students prior to and during their service-learning experience in Ghana. Recruitment of student participants was conducted in the same manner as in the previous year; however, the goal was to recruit up to five MPH students and three PA students. Monthly planning meetings were scheduled, with similar topics for each. The trip was again scheduled for late June through the first two weeks in July. Most students traveled for two weeks, with one staying for four weeks. This student applied for and received a Fulbright scholarship and was required to stay for at least four weeks. The Fulbright project was to renew a father-to-father support group program aimed at improving family planning in the district. There were nine existing formed groups that were reinvigorated, and three new groups were formed. The student met with each group and, in addition to the support group function, the participants were re-trained to become mentors in their community on family planning. Other 2018 projects included an evaluation of the factors that limit the achievement of the CHAP goals of the district, an examination of the barriers to women's reproductive health care, specifically skilled delivery, and finally an analysis of malaria data in the district.

2.6. The 2018 Program Student Participants Survey

At the end of the 2018 trip, an online survey was conducted to gather both quantitative and qualitative data from the six (6) student participants to determine their experiences with the program, the challenges they faced, and how the program could be improved. The online Survey Monkey tool was utilized to collect the data. The survey was administered to the 4 Public Health students, 1 Global Health student, and 1 Physician Assistant student who participated in 2018 summer trip. The participants were given two weeks to complete the survey. The survey consisted of 18 items assessing participant's views on the different phases of the program; 8 items assessed the pre-trip planning phase, 7 items assessed project implementation, including when students arrived on the project site, and the remaining 3 items assessed the project logistics, cost, and suggestions for improvement. In addition to the survey, each participant provided a written statement of what they learned from participating in the program as part of the formal student evaluation.

2.7. Data Analysis

We used frequencies, percentages, means and tables to analyze the quantitative data from the survey. We analyzed the qualitative data manually using the cut and paste method to compile text from the survey and the students' written statements. We read the text thoroughly to identify the recurring ideas and group them into four themes, which included what students liked about the program, what they learned from the program, the challenges they had with the program, and suggestions for improvement. The four themes derived from the qualitative data are presented in the results section under the following headings: "pre-planning sessions", "on the program site", "logistics and cost of the program" and "lessons students learned".

3. Results

3.1. Socio-Demographics of Student Participants

Nine students participated in the pilot program ([n = 3] in 2017 and [n = 6] in 2018). Five (5) were MPH students, one (1) was in the Global Health certificate program and three (3) were in the PA program. The mean age of the students was 46. The students were employed in various health and medical fields with varying years of work experience. Six had BS degrees, two had Master's degrees, and one had a PhD degree. Seven students

were females and two were males. Table 2 provides additional information on the program participants' demographic characteristics.

Table 2. Socio-demographic data of student participants.

Characteristic	Definition	Results
Age	Age Range	31–63 years
	Mean Age	46 years
Gender	Female	7
	Male	2
Educational level	BS	6
	Masters	2
	Ph.D.	1
Educational/Degree Program	MPH in Public Health Practice	5
	Global Health Certificate	1
	Physician Assistant	3
Occupation	Health care (e.g., nursing, physician assistant)	6
	Public health practitioners	2
	Other (e.g., social worker)	1

3.2. Pre-Trip Planning Sessions

Overall, 67% of the survey participants rated the pre-planning sessions as excellent, while 33% indicated the sessions were good. However, the majority (67%) indicated that they wished specific topics or issues were addressed before the trip, while 33 percent said that the pre-trip sessions were adequate, and they enabled them to be better prepared and ready for the trip. According to one respondent:

“The biggest obstacle was finding information before the trip on their topics and that if students will be linked up with persons who will help them with country specific information on their topics before they arrive, it will help them to have a better insight of their practicum project before they arrive in Wa”.

[Student 1]

With regards to student's opinions about information and communication flow from the program's director prior to the trip, 67% said it was good while 33% saw it as fair. For instance, one respondent put it this way:

“It was good, but miscommunication between the program director and the rest of group cause some stress on all of us, for example communication on hotels arrangement, flight time and the dress code were a challenge”.

[Student 2]

Another respondent stated: “I think the more information, the better. This will help us get better prepared for the trip”.

[Student 3]

All the survey participants indicated that the overall communication between students and the department program's staff and practicum instructor (faculty) was excellent. For example, one participant explained that the practicum course instructor “provided great feedback during the project planning process and they got additional details on their projects working with the instructor before they embarked on the trip”. [Student 4]. Table 3 shows the survey participants' assessment of the pre-trip planning sessions.

Table 3. Students' responses to the pre-trip planning sessions assessment survey.

Survey Items	Responses	Rate
Did you find pre-trip sessions useful?	Yes, sessions were useful	33%
	Yes, but wanted more	67%
	No, sessions topics, not useful	-
	No, I was fine planning trip my own	-
Overall communication from the department staff during pre-trip sessions	Excellent	100%
	Good	-
	Fair	-
	Poor	-
Pre-trip communication with program director	Excellent	-
	Good	67%
	Fair	33%
	Poor	-
Did program faculty provide you with the support needed to begin project prior to departure?	Excellent	100%
	Good	-
	Fair	-
	Poor	-
Overall rating for planning process	Excellent	67%
	Good	33%
	Fair	-
	Poor	-

3.3. On the Program Site

The data show that about a third of the survey participants indicated they considered their overall satisfaction with their project to be excellent, and they thought their practicums were seamless, and that they met their projects goals. In contrast, one-third, who indicated that their overall satisfaction was good thought they faced a few challenges completing their projects, but those challenges were resolved on the practicum site. The remaining participants rated their overall satisfaction with their on-site practicum experience as fair. According to them, they faced significant challenges, which took them time to fix. This following statement made by one participant illustrates some challenges the students faced on site when completing the practicum:

“When we arrived, almost everyone had to change their projects approach because we weren't told about the actual circumstances in the region [Wa West district]. Perhaps communicating with a specific person in Ghana who works in the field of each student's topic before the trip would help to reduce some of these challenges”.

[Student 5]

Another student participant remarked: “The only challenge that I faced was the language barrier during the focus groups. Thankfully, we had interpreters at the district health administration and our practicum instructor was also there to translate for us. I felt as though I had more resources and information available to me than I had anticipated”. [Student 6]. She said that because of the scope of her research there was always someone to talk to in each community and at each clinic they visited about her research topic.

All the student participants admitted that there are always challenges in any experience. They reported that there were some language barriers, especially when asking

specific questions related to the health problems on the ground. These were overcome by repeating questions and attempting to re-word them so that both the sender and receiver of information understood the question and the response. There were also challenges related to transportation due to poor road conditions, and it was not possible to visit every sub-district, although a good sample was visited.

The transportation problem was reported by some students as follows:

“The challenges that I faced during the practicum were related to physical constraints. Access to the different CHPS compounds (i.e., the health posts) proved to be difficult due to the poor road conditions. The road conditions were worsened by the rain, as it was the rainy season during my practicum”.

[Student 1]

“As a team we were limited to being out into the communities after certain times of day. We were driven back to the hotel no later than 4 pm on most of the trip, sometimes even earlier. This was due to road safety concerns with poor visibility”.

[Student 2]

Others also said that promptness when attending meetings on the part of the local people was also a limiting factor. More times than not, meetings were started later than originally planned due to local participants arriving late. However, these challenges did not affect their practicum, beside taking a longer period of time to obtain the information necessary.

A majority (67%) also indicated in the survey that they had the resources that they needed when they arrived in Wa West, the program site, to complete their practicum projects. All participants (100%) rated the on-site support they received from their practicum instructor and site supervisor as outstanding or excellent.

3.4. Logistics and Cost of the Program

The data also indicate that the majority of students were satisfied with the logistics arrangements organized by the program staff during the pre-trip planning phase. All the participants indicated that the process of obtaining visas to travel to Ghana was completed with ease, and 67% said that flight arrangements were completed with ease. With regards to hotels and housing, 67% indicated that the arrangement was easy, with only 33% who said they faced some challenges. In addition, 67% said they completed their medical/vaccination/malaria drug requirements with no help and that this was easy to do. In addition, obtaining cultural information, such as regarding the dress code, acceptable behaviors, and meals options, was not challenging. All the participants indicated getting travel insurance was easy. When the participants were asked to rate the cost of the program, 67% said it was about what they thought a trip like that should cost, while 33% said it was too expensive.

3.5. Lessons Students Learned

All the students who responded to the survey also stated in their reflection statements that they learned a great deal from participating in the program. According to one student, having the opportunity to shadow community health workers, nurses, and midwives during her practicum in the communities was “enlightening”. She said that the local health care staff do so much for the communities with limited resources, and she added, “. . . it was remarkable experience listening and engaging with the local people to find ways to address their community health needs”. [Student 2]

Another student participant explained that, in spite of her project limitations (e.g., language barrier, transportation challenges, and difficulty scheduling for meetings), she believes that her understanding of barriers to family planning has increased due to the ISL practicum experience. Her project gave her the platform to ask important questions, learn new ideas, and share family planning information in a cross-cultural context. She also said: “I learned

about leadership structures within the communities during meetings with traditional chiefs, the district administration officials, and the Ghana Health Service. It was a humbling experience, and I was amazed to see fathers coming together to openly discuss intimate and personal issues, and I believe my work made a difference". [Student 4].

One student also saw the ISL practicum as an "awakening experience" and an opportunity to engage and learn from medical and health care professionals at home (her course mates) and those in Ghana. She said she was impressed with the "Days for Girls" presentations that were made in the elementary school, and learned that "teaching and giving out simple and small things could make a difference in the life of ordinary people". [Student 6]. She intended to look for a scholarship and go back to Wa-West to work with local people on a reproductive health needs project for young girls in elementary schools.

According to one participant, the ISL practicum experience has confirmed "the concept that local people are the best source of solutions to any public health problem. They know their communities and the people because they experience life together". [Student 3]. He saw the practicum experience useful to his current job as he is involved in public health leadership and could apply all that he learned very directly to his work.

Another student participant stated that he would not have been able to understand the scope of malaria without seeing it "first-hand". He asserted that malaria is "a complex public health problem that needs multi-faceted approach to eradicate". He said that traveling to Wa-Ghana was "invaluable experience". He was highly impressed with the competencies of the local health care providers he came into contact with, from the supervisors to physician assistants to midwives and nurses. He added, "these individuals are truly on the front lines of public health, and they do amazing job with limited resources" [Student 5].

One student said this in her reflection statement: "On this trip I was the only individual who had a social work and social services background. I felt that I was able to provide a unique perspective to social issues and ask questions during interviews and focus groups that others may not have thought to ask". She added that it was also interesting for her to work with physician assistants and nurses and relate with local medical students in the practicum program who could add to her perspective, provide an observation, or ask questions she would not have thought to ask.

According to her "the experience was much more integrated than (she) had expected". She also said that some of them shadowed midwives and other clinical staff while in Ghana and were allowed to participate in the health care services that they provided, and that the experience actually helped their understanding of health care delivery in the district and local communities in Ghana [Student 6].

She also recounted that she had the opportunity to engage with a local mental health worker in one of the health centers they visited, and she was incredibly surprised to learn that the local health center had seen only one case of depression, which was related to domestic violence, and no cases of anxiety. They do not keep medication at local health care facilities to treat depression and anxiety, and most mental health patients they treat have epilepsy or a schizoaffective disorder with psychosis. When she shared this information with her student peers, they expressed the same disbelief, because in the United States epilepsy is treated by a completely different branch of health care. She stated, "I plan to share this information with the social workers that I supervise at work to facilitate a discussion on mental health at home" [Student 6].

4. Discussion

Our paper has presented the development of, and students' experiences with, the Interprofessional International Service-Learning public health education program that was piloted in a rural district in Ghana. Overall, the results from the survey and the written reflection statements of the students demonstrate that they were satisfied and enjoyed their experience with the ISL pilot program, despite its challenges. They described their experience with the program, for example, as "awakening", "invaluable", and "enlighten-

ing". They viewed their experience as "more integrated" than they had anticipated. They were impressed by the community members that they engaged with and the skills of the Ghanaian local health care providers.

These findings underscore the relevance of interprofessional international service-learning education in promoting knowledge and cultural awareness among our Public Health and Physician Assistant students. The findings corroborate previous evaluations of interprofessional education and service-learning programs [11,19,32]. For instance, Coffin and colleagues, in their interprofessional education and international service-learning program in Belize, South America, indicated that the student participants reported that the experience raised their knowledge and cultural awareness of other families' ways of life, and that they better understood service delivery in another country [33]. In a similar program piloted in Zambia, Southern Africa, students pointed out how the experience improved their knowledge and admiration for the roles and expertise of other professions and community members [34]. Additionally, our students felt they made a positive impact on the local people they interacted with because the experience was an opportunity to share health information in a cross-cultural context.

The findings also suggest that some students valued the interprofessional ISL experience as it provided them with the opportunity to share perspectives on issues and questions because of their professional background, which other students in the team lacked. Johnson and Howell also found this to be true for interprofessional health professional students working in Ecuador, explaining that the experience created a unique opportunity for the students to see other health professionals' practice scope in action, which served to demystify students' professional preconceived notions and biases and resulted in increased respect among team members [19]. Furthermore, the findings, which showed that our students felt that the experience would be useful in their careers, or that they would share their experience with colleagues, highlight the importance of interprofessional education through service learning [35].

The major challenges reported were language barriers, transportation issues due to poor roads, difficulty scheduling meetings, and the local folks' punctuality with respect to the scheduled meetings. Many of the students were participating in an interprofessional ISL program for the first time, and it was their first time working or traveling abroad to a low-resource country, underscoring the importance of adequate pre-cultural preparation. Although English is an official language in Ghana, many people speak local or regional languages. In more remote and rural communities, such as those in the Wa-West district, residents do not speak English; thus, communications required the recruitment of an interpreter, which was a need felt by the students. Additionally, differences in cultural norms and practices, such as promptness to scheduled events, group dynamics, how to dress for variations in social interaction, especially in remote areas, and even the environment, might have impacted students' experiences with the interprofessional ISL in Ghana. In fact, previous ISL programs have reported culture and language barriers as factors impacting students' satisfaction and experience [36,37]. For example, U.S. students who participated in interprofessional teams in Ecuador had to work around language barriers and limited resources, while at the same time learning about the roles and work of other local health professionals [19]. Therefore, better preparing our future students may require in-depth pre-cultural trainings and webinars on local languages spoken and cultural norms, as well as an introduction to health care delivery in the country, and the political and socio-economic development, including road network conditions in rural Ghana.

The program has several limitations. The first year was very limited in its scope. Only three students participated: one MPH student and two PH students, which constrained their ability to work on several health issues presented by the district. This improved during the second year. However, the program currently limits its staffing to no more than 10 students at any given time. Adjustments to staffing in the future should help improve this. The second limitation has to do with the time constraints while in Ghana. Work and family obligations limited the amount of time the students and program staff could travel

to Ghana. All the MPH students who traveled had full-time jobs and struggled to get any longer than two weeks of vacation time. This limitation is a concern as it impacts the students' ability to completely execute their proposed projects. With the travel time, onsite orientation, and various introductions to community leaders and administration protocols during the first week in the country, the actual time the student had to devote to their project was extremely limited. Allowing students to continue working on their projects remotely after they leave the project site in Ghana can mitigate this issue in subsequent years.

The final limitation relates to the status of the program. Like most academic institutions, UMass Amherst faculty senate guidelines require international partnerships or programs to go through a thorough formal evaluation and approval process. The program had not gone through a rigorous process during the pilot stage. Once this is done, it would give the program some distinct advantages for both the students and the program's site in Ghana. In particular, students' financial burden would reduce, in-country logistics would be more streamlined and would not be directly negotiated by the current program staff or students, and additional staffing might be possible. Currently, all students who travel with UMass must register their travel. This registration process both ensures that the students' location is known to UMass and the U.S. State Department, and provides each traveler with emergency health insurance and travel insurance in case of a natural disaster or illness.

5. Conclusions

The gap between public health and health care delivery in the U.S. remains a challenge. However, we can start to close the gap by developing interprofessional ISL programs that allow students from various health care and public health fields to learn from each other. This pilot program met its goals, and the student participants were, in general, satisfied and enthusiastic about their experience. Lessons that students learned can now be integrated into their practice and hopefully make them better health care professionals. This program might be sustained and improved to meet the needs of future beneficiaries, including students and the communities that they serve, by expanding staffing levels, developing more comprehensive pre-trip cultural trainings and webinars, obtaining institutional level approval, and seeking grant funding to support travel.

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Data Availability Statement: The program data are available upon request from the corresponding author and with approval from the program's Institutional Review Board.

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