

ADVANCING HUMANITY in CAMBODIA

2010 – 2011 Learning Community

JoAnn Burkhardt, PhD., McMaster Fellow
 Fred Coulter, PhD., McMaster Associate Fellow
 Donald Buerk, PhD., McMaster Associate Fellow
 Brittany Coats, McMaster Scholar
 Amanda Johnson, McMaster Scholar
 Matt Johnson, McMaster Scholar
 Cindy Obermyer, McMaster Scholar
 Kellie Raypole, McMaster Scholar
 Brooke Zachrich, McMaster Scholar
 Rebecca Zebrowski, McMaster Scholar

2011 – 2012 Learning Community

JoAnn Burkhardt, PhD., McMaster Fellow
 Fred Coulter, PhD., McMaster Fellow
 Donald Buerk, PhD., McMaster Associate Fellow
 Craig Bills, McMaster Scholar
 Kelly Cooper, McMaster Scholar
 Nicole Grim, McMaster Scholar
 Alexis Pierce, McMaster Scholar
 Zachariah Polzin, McMaster Scholar
 Kellie Raypole, McMaster Scholar
 Emma Starks, McMaster Scholar
 Taylor Tuttle, McMaster Scholar



McMaster Cambodia Learning Community 2010 - 2011

JoAnn Burkhardt, McMaster Fellow, Cambodia 2010 - 2011

The 2010-11 Cambodia Learning Community consisted of seven McMaster Scholars, one McMaster Fellow, and two Associate McMaster Fellows. Among the community members, the education, behavioral arts and sciences, arts and humanities, science and business divisions were represented. In other words each division on campus was represented within this group.

The community based research projects included water testing, best practices in group therapeutic settings, literary awareness, natural forms of birth control, microscope training, increasing goal setting skills of clients, and malaria detection. During this academic year our community partners were the Southeast Asia Children's Mercy Fund, The Cambodian Women's Crisis Center, the Governor of the Bateay Meanchey Province, and the Ministry of Health in Battambang Province.

Helping to Diagnose Malaria

Brittany Coats, McMaster Scholar, Cambodia 2010 - 2011

The purpose of this project was to provide training materials on how to microscopically diagnose malaria, as well as microscopes and other necessary supplies, to medical personnel throughout Cambodia so that the rate of successful diagnosis might increase. In my review of literature, I discovered that many health facilities in Cambodia lack access to equipment like microscopes and to the training or resources needed to use microscopes in order to accurately diagnose malaria, a potentially deadly disease commonly found in Cambodia's remote and forested areas. The common method of diagnosis currently used in these areas is the rapid diagnostic test (RDT), which does not always provide accurate or enough diagnostic information to diagnose and treat malaria effectively. In attempt to counteract this problem, I collected microscopes from hospitals, clinics, and schools, conducted research to create manuals on how to microscopically diagnose malaria and use a microscope, and created a brochure comparing the use of a microscope to an RDT. I also identified a battery-powered LED light source for use in locations with no or limited electricity. I then developed a training that I presented to a total of twelve representatives from clinics and hospitals in Battambang, Banteay Meanchey, and a small village near Phnom Penh. Both the supplies and training materials were well received and will be shared with other health facilities and medical personnel in need.

Capacity Building in Cambodia

Amanda Johnson, McMaster Scholar, Cambodia 2010 - 2011

The purpose of this project was to build the capacity of the staff members at the Cambodian Women's Crisis Center (CWCC) by providing training and materials pertaining to group therapy. After reviewing professional literature and speaking with the CWCC, the need for training the staff on group therapy was established. Since the Khmer Rouge genocide and its destruction of all educational materials, it was determined that most staff and professionals working for the CWCC would benefit from training. In addition, social service in Cambodia has been slow to develop because of the extreme poverty, the need for educational materials, and the corruption present within governmental structures. In response to stated needs, a manual was developed focusing on best practices in group therapy and instruction consisted of the following: why group therapy is important; goal setting; stages of group therapy; when to intervene during therapy with clients; how to intervene with clients; and various activities that would be considered "ice breakers" or introductory exercises and therapeutic activities. Training on group therapy and the use of mandalas was performed in Phnom Pehn, Banteay Meanchey, and Siem Reap at three CWCC locations. Approximately fifteen staff members were trained at each crisis center. The desired outcome of this project was that the staff members would be more effectively trained and equipped to help the clients within the organization. In addition, it is hoped that the staff members would be empowered to train others and to continue their education and trainings.

Water Testing

Matt Johnson, Kellie Raypole, McMaster Scholars, Cambodia 2010 - 2011

Water is an important commodity for human survival due to its universal use, not only as a drinking source but also as a necessity in cooking and for hygienic purposes. Clean water is a privilege that many people, especially those in well-developed nations, take for granted each and every day. However, in developing countries, like post-genocidal Cambodia, clean drinking water is not a guarantee but rather a stressful concern haunting people every day. The purpose of this project was to assess the chemical quality of water, including testing for two well-documented toxins that have been previously detected in Cambodian water sources, arsenic and microcystins. Testing was conducted in both urban and rural areas of Phnom Penh, Battambang, Bantaey Manchaey, and Siem Reap. Following the completion of testing at each of the sites, a complete report displaying the results was given to each test site community along with background information, remediation options, and a thorough presentation explaining each chemical parameter tested. Arsenic and microcystins were chosen for this study due to previous research that had identified these contaminants in Cambodian freshwater drinking sources. However, the data collected during this project at all 18 sites suggested that the toxins were either not present or present in only minute quantities. Therefore, the water tested would be safe with respect to these contaminants by standards set by the World Health Organization. However, further research needs to be conducted to assess other microorganism contamination levels and suspended sediment levels that could possibly result in health complications.

Scholars Kellie Raypole and Matt Johnson testing water in Cambodia 2011



Scholar Cindy Obermyer teaching cycle bead birth control methods to health care professionals in Cambodia 2011



Training in Natural Birth Control Techniques

Cindy Obermyer, McMaster Scholar, Cambodia 2010 - 2011

The purpose of my project was to travel to the Cambodian Women's Crisis Center (CWCC) and train clients on two natural forms of birth control, the Standard Days Method and the Two Day Method. Using these methods, I utilized cycle bead necklaces which provide a great visual aid and are easily made at low cost. While reviewing the professional literature, it was determined that Westernized birth control was not widely used due to cultural non-acceptance of the methods, lack of knowledge of birth control methods, and differences of opinion concerning when ovulation and conception occur. The professional literature studied stated that the majority of women in Cambodia do not believe pregnancy could potentially occur every month.

The Standard Days and Two Day methods were presented to women, helping them understand how to track and better understand their menstrual cycle, thereby empowering women with the knowledge and means to prevent or plan a pregnancy. Overall, 160 cycle bead necklaces, which are used in the Standard Days Method, were given along with training provided to clients at the CWCC in Phnom Penh, Sisiphon, and Siem Reap. In addition, training was provided to women living in Kampol district. The desired outcome of the training was to empower women to understand their reproductive system and choose to plan or prevent pregnancy.

Increasing Capacity through Strategic Trainings

Brooke Zachrich, McMaster Scholar, Cambodia 2010 – 2011

Literacy Training

The purpose of this project was to build the capacity of the staff and women at the Cambodian Women's Crisis Center (CWCC) by developing training materials on language development to increase literacy rates in young children. The training was developed in response to the CWCC staff expressing a need for educating women, in particular women who are illiterate, in different styles and techniques of storybook reading. In reviewing the professional literature, it was determined that two different styles of storybook reading can be effective for children. The performance style (reading the story first with discussion, then reading a second time to act out the story) is more appropriate for children with higher word knowledge, while the describer style (telling the story by describing the illustrations) is more appropriate for children with lower word knowledge. The describer style was emphasized due to the number of women who are illiterate in Cambodia and due to children having little experience with books. Approximately forty women and staff at the CWCC in three different cities, Phnom Penh, Sisaphon, and Siem Reap, received literacy training. The desired outcome from the training was to provide the clients and staff with knowledge of different and effective storybook reading styles so they can use them while reading with young children to increase literacy and language development.

Teaching Non-Violent Games

The purpose of this project was to build the capacity of the clients and the staff at the Cambodian Women's Crisis Center (CWCC) pertaining to the impact of violence on children. An emphasis was placed on how to play non-violent games and the benefits of non-violent games so the children at the shelter have an alternative to potential violent play or behavior. In reviewing the professional literature, it was determined that children can be negatively impacted from exposure to violence which can be characterized by increases in aggression, anxiety, and emotional distress. Children can also experience high risks of antisocial behaviors, suicidal behaviors, and depressive disorders when encountering abuse. Non-violent games can lead to decreases in the side effects created by exposure to violence. Approximately thirty women at the CWCC, in three different cities—Phnom Penh, Sisaphon, and Siem Reap—received non-violent game training. The desired outcome of the training was that the women participating would be empowered to teach their own children and others non-violent games and to understand why non-violent games are beneficial for children who have been exposed to violence.

Micro-Business Training

Rebecca Zebrowski, McMaster Scholar, Cambodia 2010 - 2011

The purpose of this project was to provide micro-business training that would augment the reintegration program at the Cambodian Women's Crisis Center (CWCC). Their program helps to empower Cambodian women escaping sex trafficking and domestic violence situations by providing skilled training in cooking and sewing. Clients in this program can then apply for grants or micro-loans before leaving CWCC shelters with the hopes that they will be able to begin a sustainable business using their learned skills. Building upon the work of former McMaster Scholars Sara Plas, Charlene Williams, and Kim Lammers, this project sought to elaborate on the logistics of starting a micro-vending business once a loan has been received and a vision has been established. In order to collect this information, a survey of the professional literature was conducted. A study from the International Labor Organization (ILO) was especially helpful in deciphering the details of micro-vending businesses in Cambodia. A manual was compiled in order to report the ILO's findings regarding things like the pros and cons of certain micro-vending locations, average market stall rental costs, and strategies to ensure optimal competitiveness with other Cambodian micro-vendors. An interview was also conducted with a former CWCC client, Oeak Soey Poe, who had established a successful micro-business utilizing a grant from the CWCC. Both her insight and the information from the



Becca Zebrowski, scholar, teaching marketing strategies in Cambodia 2011

literature were incorporated into training sessions, which were provided along with the manuals to both the reintegration staff and clients at the CWCC shelters in Phnom Penh, Banteay Meanchey, and Siem Reap. Clients who received training expressed their excitement at understanding practical methods for utilizing their learned cooking and sewing skills to secure a sustainable livelihood. Staff members expressed a desire to formally incorporate these materials into their reintegration training for future CWCC clients.

McMaster Cambodia Learning Community 2011 - 2012

JoAnn Burkhardt, McMaster Fellow, Cambodia 2011 - 2012

The McMaster Cambodia Learning Community first worked in Cambodia during the 2004-2005 academic year. Since this initial year of community-based research, both the number and variety of projects and community partners have increased.

This year the interdisciplinary Cambodia Learning Community consisted of eight McMaster Scholars, two McMaster Fellows and one Associate McMaster Fellow from the education, behavioral arts and sciences, arts and humanities, and science division. In addition to learning to conduct community-based research, developing protocols and training materials, this learning community also studied Theraveda Buddhism, the culture of Cambodia, how to travel internationally, the Khmer Rouge regime and post-conflict reconstruction of societal resources and infrastructures.

This was a year of transition for the McMaster Cambodia Learning Community. We began to work with new partners including ADD Cambodia, Health Care for Children, World Hope International and Khousar Thmey. We made plans to work with these partners again in 2012-2013. In addition, plans were made to also partner with Heifer International, Disability Action Council (Kingdom of Cambodia) and The University of Banteay Meanchey for the 2012-2013 academic year.



Cambodia and Disability: An Emerging Perspective

JoAnn Burkhardt, McMaster Fellow, Cambodia 2011 - 2012

Introduction

The purpose of this project was to begin to learn how Autism Spectrum Disorder is defined and understood within the country of Cambodia. Sun and Allison (2010) indicated that although 26 studies pertaining to autism have been conducted in Asia, there was an absence of written studies pertaining to autism from Cambodia. In addition, Carter (2009) states that prior to the 2009, there has been an absence of formal research pertaining to intellectual disabilities in Cambodia. Semi structured interviews were conducted with three governmental officials, three administrators from Non-Governmental Organizations (NGOs) and two building level administrators (Directors) from two public high schools. In addition, the staffs from three NGOs were asked to discuss their understanding of autism within the kingdom of Cambodia.

Each group or individual was asked three questions. They were:

1. What disabilities are present within the population of Cambodia?
2. What is autism?
3. What is the relationship between Buddhist practice/beliefs and disabilities?

During these semi-structured interviews, follow up questions were asked throughout the interviews to clarify points or to request further information on a topic. All of the participants spoke English so the use of a Khmer translator was not necessary. The researcher recorded responses in writing in the form of field notes.

Interviews

The Deputy Director and the Assistant Deputy Director for Disabilities within the Ministry of Social Affairs, Veterans and Youth Rehabilitation provided information pertaining to the Disability Action Council (DAC) and the 2009 Hagar Study (Carter 2009). This study was conducted by Carter (2009) for Hagar International with the support from UNICEF and the kingdom of Cambodia. The findings from this study suggested that villagers and commune leaders, individuals within communities and NGOs lack a clear understanding of disability. The directors agreed with the findings of the study and disclosed that they understand disability to include both physical and intellectual disabilities. They indicated that they were familiar with the term autism but considered it to be another type of intellectual disability. They indicated that they viewed the role of the Ministry as one of endorsing the work of various NGOs and their work with disabilities. These directors lead the Disability Action Council (DAC), which appears to be a clearinghouse within the kingdom for initiatives pertaining to serving the needs of Cambodians with disabilities. The focus of DAC is to endorse programs which provide services within communities. The directors stated that Theravada Buddhism plays an important role when discussing disability within Cambodia and that they believed that it impacts the view of most Cambodians in their understanding of disability. They indicated that Buddhist practices and beliefs are a major influence in all aspects of a Cambodian's life, and although they cannot change the teachings of this religion, they were optimistic that a Cambodian's view of disability could be changed. During the interview, the directors offered that building the capacities of individuals with disability was the most important charge of the DAC.

The Associate Executive Director from ADD, an established disability advocacy organization (acronym doesn't translate easily to English therefore I will just use ADD in this document) provided information pertaining to disability in Cambodia. His organization focuses on developing the capacities of individuals with disabilities through the formation of Disabled People's Organizations (DPOs). These DPOs focus their work on advocating for the rights of people with disabilities. He indicated that he understood disability to include many areas including hearing and vision impairments, physical disabilities, and intellectual disabilities. He stated that he was familiar with the word autism but defined it as a type of intellectual disability. He indicated that building the capacity of individuals with disabilities was the primary function of his NGO. He indicated that Buddhist beliefs, more often than not, influenced community views toward disability. Members of his staff provided several client cases pertaining to individuals with disabilities and their families. They stressed that the main function of ADD was to develop the capacities of individuals with disabilities. Various staff members indicated that disability included physical and intellectual disabilities but appeared unfamiliar with the term autism.

Staff members from Khousar Thmey indicated that disability included physical, intellectual, vision, and hearing impairments. Their organization is involved primarily with the care and education of children who have been orphaned or abandoned. In addition, the organization has founded and continues to manage several schools for children who are deaf or have been identified as having a hearing impairment. As with other NGOs interviewed, the staff agreed that they were familiar with term autism but were unable to define the term. The staff indicated that Buddhist beliefs strongly influence how disability is viewed in Cambodia.

The director of Health Care for Children (HCC) in Cambodia indicated that it has only been recently that the needs of children with disabilities have been an item of discussion among directors of NGOs and ministry officials. Her organization works with women and children who are victims of, or at risk for trafficking, sexual abuse, or labor exploitation.

She stated that she understood disability to include both physical and intellectual disabilities. As with other officials and directors in Cambodia, she was familiar with the term autism but considered it an intellectual disability. Her organization does not offer programs or assistance to individuals with disabilities except for assisting families gaining access to medical care for family members of clients. The staff indicated that lack of services for individuals with disabilities was a problem in Cambodia. They also offered that public schools did not have programs for children with disabilities. This staff mainly discussed disability as being a physical disability but included “mentally sick” as also part of the definition.

The national director for Heifer International indicated that the needs of individuals with disabilities and their families were often a topic of concern among the Heifer leadership groups in communes throughout the country. Heifer International in Cambodia is focused on empowering poor families through the implementation of integrative agricultural practices. She offered a definition of disability, which included physical, hearing, vision, and intellectual disabilities. This director was familiar with the term autism but was unable to provide a definition of the term. She stated that she had read about autism and attended Heifer conferences where the topic was addressed. In response to a question about disability and Buddhist beliefs, she commented that Buddhist beliefs and practice are related to all things in Cambodia.

The director of Hun Sun High School in Phnom Penh and the director of Chea Sim Takev High School in Takeo both responded to interview questions. Both direct large, public high schools with the population of 500 students, split among morning and afternoon sessions. They both stated that children with disabilities are not permitted to attend the public schools. They defined disability as physical disability and only when prompted with a follow up questions, did they include intellectual disabilities within the definition. They both disclosed that they had relatives with disabilities (physical) and noted that these relatives received “learning from the families”. Both directors explained that most students with disabilities could not learn and that the high school students would be frightened by students with disabilities. These two participants did not recognize the term autism and could not provide a definition of autism.

Findings

Several themes emerged from the interview data. These themes include:

- disabilities exist in Cambodia
- individuals with disabilities face poor outcomes
- individuals with disabilities and their families need training and education
- the 2009 Disability Law will bring changes to the country
- religious beliefs impact how disability is viewed in Cambodia.

Discussion

Based on the responses from the semi-structured interviews, it appears that at least for the individuals and groups interviewed, that an emerging view and understanding of disability and autism exists in Cambodia. The need for training and a desire to assist people with disabilities to live productive lives was strongly communicated during the interviews.

Next Steps

Each NGO stated that it would like training pertaining to disability when the McMaster Cambodia Learning Community returns to Cambodia in May of 2013. The officials from the Kingdom of Cambodia expressed a desire to partner with Defiance College as they continue to develop initiatives to serve Cambodians with disabilities.

References

- Carter, J. (2009). *Toward a cooperative approach*. Phnom Penh: HAGAR.
- Sun, X. and Allison, C. (2010). A review of the prevalence of Autism Spectrum Disorder in Asia. *Research in Autism Spectrum Disorders*. 4(2010),156-167.

A Survey of Available Technology for Teacher Training in Selected Cambodian Schools

Fred Coulter, McMaster Fellow, Cambodia 2011 - 2012

The purpose of the McMaster Fellow project for 2011-2012 was to document available technology at selected schools in Cambodia with the goal of connecting teachers in that region with education majors at Defiance College. Once an electronic connection can be made, the objective will be for education majors to create training materials based on educational topics requested by the Cambodian teachers. The exploration of the electronic connection between teachers in Cambodia and Defiance College students began in May of 2010 when teachers at a secondary school (high school) in Phnom Penh requested that they be able to see teachers in the United States implementing active learning in their classrooms. In May and June of 2012, the McMaster School Cambodian Learning Community (CLC) conducted teacher training in-services at two high schools. Also, the CLC met with faculty and students at a post-secondary school.



Fred Coulter, fellow, and Niki Grim, scholar, teaching in Cambodia 2012

The McMaster Fellow interviewed administrators and faculty at each of the three educational institutions and gathered data about the technology available to them. At the Chea Sim Takev High School in Takeo, the principal and vice-principal both said that the school did not have any internet technology. In fact, they did not have email addresses, which speaks to the lack of technology in this rural area. At the Hun Sen Secondary School in Phnom Penh, the access to technology was very different. The school had a computer lab with twelve desk top computers and a console computer connected to an LCD projector. All the teachers attending the in-service had email addresses and access to the internet through the school. The administrators and faculty at Mean Chey University stated that the school had a computer lab with internet access. Like the faculty at the secondary school, they

all had email addresses. Results of the interviews indicated that access to technology varies from rural areas to large cities to the developing provinces. Recommendations for the next steps in the project are to first research the software capabilities of the secondary school and university such as Skype. This would enable Defiance College students to directly interact with teachers in Cambodia.

The second objective was to survey the cell phone capabilities of the schools and university. At this time, Cambodia has 3G service with plans to upgrade to 4G. This could mean that contact could be made with the schools and university through the cell phone network. Finally, a similar survey of technology assets should be made of all the CLC's community partners, including medical facilities, religious groups, and human service agencies. This and future projects can serve as the foundation for year-round interactions with community partners in Cambodia and the Defiance College campus.

Building a Positive Relationship within an Arranged Marriage

Kelly Cooper, McMaster Scholar, Cambodia 2011 - 2012

The purpose of this project was to provide training materials about promoting strong relationships within marriages. In my review of literature, I found that arranged marriages and typical gender roles are common in Cambodia. Women are seen as weak and men are seen as the head of the household. Through my review of literature and information obtained from my Cambodian community partners, I learned that domestic violence is a major problem troubling Cambodia. Encouraged by a request from several community partners, I developed training materials based on Dr. John Gottman's research of making a marriage successful. Gottman outlines seven principles of making successful marriages emphasizing communication and friendship.

Once the training materials were developed, they were translated in Khmer and printed. For my training sessions, I presented to professionals from Healthcare Center for Children (HCC) and Cambodia Women’s Crisis Center (CWCC) in Phnom Penh. In Phnom Penh I worked with victims of domestic violence at CWCC. I trained professionals at Krausar Thmey in Battambang, Sissophon, and Siem Reap. The final training was with professionals from CWCC in Siem Reap.

Training materials included a training manual in English and Khmer which were left with the staff at each location for further training. Upon reflection of my work, I learned that domestic violence in Cambodia and the United States is very similar. My project received mixed reviews from professionals in Cambodia. It appeared that strong cultural beliefs influenced counselors and social workers to be in conflict with suggestions that women and men can be partners in marriage and that women have rights within a marriage.

Reference

Gottman, J. M. (1999). *The Seven Principles of Making Marriage Work*. New York: Three Rivers Press.

Post-traumatic Stress Disorder Training

Craig Bills, McMaster Scholar, Cambodia 2011 - 2012

The purpose of this project was to provide training materials that dealt with the definition, diagnosis, and strategies for dealing with post-traumatic stress disorder (PTSD). I provided training in Phnom Penh at the Healthcare Center for Children (HCC) to 20 people, the Cambodian Women’s Crisis Center (CWCC) shelter to 15 women, and the CWCC center to 10 staff. In Battambang, I gave the presentation at Krusar Thmey to 2 staff members. In Sissaphon, I presented at Krusar Tamey to 15 staff members.

In my review of literature, I found out that PTSD is prevalent within Cambodia. It is estimated that approximately 65% of the population experience symptoms of the disorder (Sonis, Gibson, deJong, Field, Hean, & Komproe, 2009). Since the reign of the Khmer Rouge, the population as a whole has been effected and much of the population has PTSD. I was also able to find literature that showed that PTSD can be generational. I was able to find some self-help tips to ease the intrusion of anxiety and stressful thoughts. This led to developing training materials based on the findings in the literature. Once the training materials were developed, they were translated in Khmer and printed.

For my training sessions I explained what PTSD is and explained the different PTSD categories. I proceeded by teaching the diagnostic criteria, coping mechanisms, and some theories on PTSD. I ended the session by showing some breathing techniques and providing training in using several self-help inventories.

*Cambodia Learning Community at
Krousar Thmey Child Protection Center*



*Emma Starks, scholar, teaching
the use of birthing kits*



The outcomes of my project were:

1. Training materials in Khmer, including a training manual, papers on breathing techniques, and instructions about the safe place worksheets were left with the staff for further training.
2. Professionals were trained in best practices related to information about PTSD that included sharing information about generational PTSD.

Upon reflecting on my work I learned how the effects of PTSD could really impact people as a whole, especially when it is an entire country. I feel that my contributions will help those who were there to listen. I hope that the information I shared will enable them to start healing.

Reference

Sonis, J., Gibson, J., deJong, J., Field, N., Hean, S., & Komproe, I. (2009). Probable posttraumatic stress disorder and disability in Cambodia. *JAMA, the Journal of the American Medical Association*, 527-536.

Teacher Training

Alexis Pierce, Nicole Grimm, Zachariah Polzin, McMaster Scholars, Cambodia 2011 - 2012

The purpose of these projects was to provide instruction and training materials to teachers in Cambodia. In previous McMaster trips, teachers had expressed interest in teaching theories, which our project addressed. In the literature review, we found that the utilization of Bloom's Taxonomy within classroom instruction is considered one of the best teacher practices in the United States. The use of Bloom's Taxonomy in all classrooms is closely aligned with cognitive development. The research suggests that students must be guided to a certain level of thinking in order for gains in critical thinking and problem solving to occur.

This information led us to develop training materials based on our research. We constructed a manual about Bloom's Taxonomy. The model included a detailed description of each stage of Bloom's Taxonomy, along with information about higher and lower order thinking. We also created videos about various schools in Northwest Ohio. One of our community partners, the teacher leaders at Hun Sun High School in Phnom Penh, has requested that our training be stored on a DVD so that many teachers could benefit from the training.

These training materials were then translated into Khmer and printed. For the videos, we burned several copies onto DVD's, as well as copied them onto flashdrives, uploaded them onto ge.tt (a video sharing site), and printed hard copies. This was to ensure that one form or another of the video would be available in Cambodia. The training materials we created were left with the teachers in Cambodia so that they could share this information and research with other teachers.

We presented training sessions in Phnom Penh, Kendall Province, Tekev, Battambang, Bantaey Mean Chey Province, and Siem Reap to a total of 60 teachers.

Upon reflection of our projects, we learned that many teachers in Cambodia are hungry for knowledge and training. In the rural areas, teachers do not receive much training. Learning theories was a new concept to most of the teachers in Cambodia, whereas in the United States, education students are taught these theories as undergraduates in baccalaureate programs.

Microscope Project

Zachariah Polzin, McMaster Scholar, Cambodia 2011 - 2012

My project on microscopy in Cambodia included three parts: 1) training of hospital staff in microscopy to diagnose malaria; 2) training high school teachers in basic microscopy to enhance current curricula; and 3) collection and repair of microscopes. All materials created were translated into Khmer, the language of Cambodia, and presentations were done through a translator, Sun Sovichea. Dispersal of microscopes and materials occurred in May of 2012.

The first part of my project, hospital training, is a continuation from a project started by past scholars from Defiance College, including Brittany Coats who created an excellent malaria diagnosis manual as well as microscope operation protocol with oil immersion. Microscopy is the gold standard for malarial diagnosis. In hospitals I worked with technicians on how to operate and care for microscopes. I trained approximately 20 medical staff between two hospitals – a hospital in Khandal Province and Sissophon in Banteay Meanchey – in basic microscopy and gave them an overview of Coats' malaria manual. In both cases there was some experience using microscopy to diagnose malaria and other diseases, but experience was limited to a few individuals. The added microscopes are sure to advance the individuals in both hospitals in their respective fields.



Zac Polzin, scholar, teaching microscope techniques

The second part of this project involves microscopy in high schools and universities. Microscopes had been donated for academic purposes in the past, but a formal protocol for academic training had not been created. For compound light microscopes, I used Coats' operation manual. For dissecting microscopes, I created a very basic operation manual that was translated into Khmer. I also created kits for microscope use and maintenance. These kits included battery operated lights (all microscopes lacked electrical capabilities and past experience showed that even with power converters microscopes were unusable in Cambodian outlets), Kim tech wipes, lens paper, training slides, blank slides with cover slips, water droppers, and petri dishes. I trained approximately 40 teachers between three high schools – a high school in Khandal province and two schools in Phnom Penh – in basic microscopy. Microscopes dispersed included seven light microscopes and four dissecting microscopes. Of those 40 teachers, only three biology teachers had ever used microscopes; those three had been loosely trained years earlier and had not seen or used a microscope since. There is nothing that compares to the smiles on their faces when I showed them how to make their own slides and look at living organisms that small for the first time. One compound light and one dissecting microscope were also given to Meanchey University in Banteay Meanchey. This is a fairly new university with 170 pre-medical students in attendance. All look forward to continued education on the subject and future assistance in using microscopy to advance their students.

I see a great future in this project. Hospital microscopes will continually be useful in diagnosing malaria. There is also the possibility of further diagnostic materials from future scholars. For myself, I have gained much more insight into microscopy than I did as an undergraduate molecular biology major. While I had been given a good background, it wasn't until this project and talking with Brittany Coats about her work that I began to really understand microscopy. I had collected 25 microscopes throughout the year and after many hours of work and trial, I was able to refurbish 18 school and hospital quality microscopes. As a result of this project, I plan to pursue this area in the near future.

Water Testing

Kellie Raypole, Taylor Tuttle, McMaster Scholars, Cambodia 2011 - 2012

The purpose of this project was to assess water quality parameters in Cambodia so that information pertaining to harmful contaminants could be disseminated to our community partners. Research has shown that water quality is poor in Cambodia, often causing dysentery and even death in infants. In addition, unsafe levels of naturally occurring arsenic has been detected and reported from the Mekong River, the Mekong Delta, and the hundreds of tributaries aligned with the Mekong River. Our research focused on water contamination, including how to test for contaminants, sources of contaminants, and methods to address contamination.

Water samples were tested from 14 locations. The locations were distributed among both the rural and urban areas and included Angkor Wat in Siem Reap, Cambodian Women's Crisis Center in Phnom Penh, Krousar Thmey in Sissophon, Siem Reap River in Siem Reap, Serei Sophon Referral Hospital in Sissophon, and the Bassac River in Phnom Penh. Other locations included two Buddhist Monasteries, three public school compounds, and various hotels and restaurants.

Our testing results found that 20 out of 21 samples contained safe levels of ammonia, and 19 out of 21 samples contained safe levels of arsenic. Each of the 21 samples was found to have no nitrates. pH levels for each of the 21 samples was also found to be within the standard range of 6.8-7.2. Phosphates were found to be low in all but five samples. Testing for *E. coli* proved to be challenging as the samples needed to be kept at a warmer temperature than what we had available.

Testing results were presented to our community partners, in which we explained the results and possible impact of various contaminants. Following the information session, the results were distributed in Khmer along with a Khmer document on how to treat water for any of the found contaminants. The outcome of this project was to provide citizens of Phnom Penh, Battambang, Banteay Meanchey, Takeo, and Siem Riep a sense of relief that in fact their water was largely within safe levels for the contaminants tested. Upon reflection, it was concluded that although the country of Cambodia is still developing, significant advances in water technology have been made since research was published in 1998, 2000, and 2005.

Counselor and Social Worker Training

Emma Starks, McMaster Scholar, Cambodia 2011 - 2012

The purpose of this project was to provide training materials and training on clinical interviewing skills as well as on Abraham Maslow's hierarchy of needs to various staff and agencies in Cambodia. In my review of literature, I found that due to the brutal regime of the Khmer Rouge, which occurred between 1977 and 1979, Cambodian professionals are critically under-trained. During this regime, over three million Cambodians were executed, died from starvation or disease, or fled the country. The Khmer Rouge executed Cambodians "guilty" of having an education, speaking a second language, or being politically active. The goal of the Khmer Rouge was to return the country to its agrarian roots and begin again at Year Zero. As a result, through the early 2000s, the country has lacked skilled individuals within specific disciplines to train the next generation of teachers, doctors, lawyers and other needed professionals; thus, social workers and counselors lack basic training in most aspects of client care.

My review of literature and information obtained first hand from the Cambodian Women's Crisis Center (CWCC) indicated that social workers and counselors lack training in conducting professional clinical interviews and interacting with clients. In addition, I discovered that often agencies begin counseling and goal setting with clients prior to the clients' basic safety and security being met. The staff at several partnering agencies requested and wanted to learn different interviewing techniques so that they could engage with their clients in a more productive manner.

I also felt that understanding Maslow's hierarchy of needs was vital for the staff in order for them to help the clients getting their needs met and goals accomplished. This led me to develop training materials based on the interviewing techniques that social workers practice in the United States, as well as implementing Maslow's hierarchy of needs. Once the training materials were developed, they were translated in Khmer and printed. I presented training sessions to professionals from Healthcare Center for Children (HCC) and Cambodia Women's Crisis Center in Phnom Penh. I trained professionals at

Krousar Thmey in Battambang, Sissophon, and Siem Reap. The final training was with professionals from CWCC in Siem Reap. The outcomes of my project consisted of training materials that included interviewing techniques as well as Maslow's hierarchy of needs which were left with the staff for further training.

Upon reflecting on my work, I learned that the staff wanted to provide a high level of service to their clients and had a great appreciation and need for my training. Both the interviewing techniques and Maslow's hierarchy of needs were received in a very positive manner by the staff, and they shared with me how useful this information will be when helping and interviewing their clients.



Scholars Kellie Raypole and Taylor Tuttle explaining water testing results to health care professionals in Cambodia



Emma Starks, Alexis Pierce, scholars in Cambodian classroom