An International Experiential Learning Program: A Study Abroad Experience in Uganda[1]

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Abstract

An international experience helps create an awareness of international perspectives and prepares students for a global workforce. Creating an effective study abroad experience requires strong collaboration and active involvement of local and foreign host partner institutions. This paper describes a one month summer study abroad experience in Uganda developed jointly by North Dakota State University (NDSU) and Makerere University in Kampala, Uganda to offer international educational experiences with an emphasis on animal production and health. The elements shared in this paper include: course overview and objectives; course requirements, content and evaluation, management and funding; student participation; the experiential learning experience in Uganda; impact; benefits; challenges; student comments; and future directions in promoting international learning experiences. The course supports NDSU's mission to "address the needs and aspirations of people in a changing world," its vision to "be globally identified as a contemporary metropolitan land grant institution" and its core values to "reflect and serve geographically and culturally diverse populations," "remain committed to serving people globally" and "value collaboration with colleges and universities around the world." When considering a study abroad experience, students should be encouraged to broaden their choice of place and include non-traditional destinations such as developing countries in Africa.

Introduction

Although food insecurity is often perceived as a problem of the developing world, it is a global problem. According to projections from the Food and Agriculture Organization of the United Nations (FAO), the World Food Summit goal of halving the number of food-insecure people from 800 million in 1995 to 400 million by 2015 will not be achieved until 2030 (FAO, 2000). During the next two decades, the world's population is projected to increase by 24% and to reach 7.5 billion in 2020. Virtually all of the population increase will take place in developing countries and much of it in the urban areas (United Nations, 1999). The rapid urbanization of the developing world and associated changes in lifestyles will have profound effects on food preferences and hence on demand (Pinstrup-Andersen, 2001).

Increasing global food production and productivity is essential to achieving food security. Satisfying the global demands for increased crop yields and animal products in the coming decades will require adopting strategies that alleviate the factors contributing to food

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insecurity in developed and developing countries. These factors include insufficient investment in agricultural research and modern technology, inadequate extension services linking researchers and farmers, insufficient or improper use of inputs, poorly functioning markets, lack of appropriate infrastructure and lack of timely access to credit (Pinstrup-Andersen, 2001).

One strategy that may positively influence food security is increased investment in higher education in agriculture with an emphasis on global agricultural needs and challenges and potential solutions. As the need for increased global food and agricultural scientists is addressed, international learning experiences are becoming critical to an undergraduate's education (Zhai and Sheer, 2002). An international experience helps create an awareness of international perspectives and prepares students for a global workforce (Unruh-Snyder et al., 2011). Possessing agricultural knowledge in addition to international experience is considered an advantage by employers (Thornton, 1992; Association of American Colleges and Universities, 2007). Additionally, international learning experiences broaden cultural awareness (Unruh-Snyder et al., 2011). Combining cultural awareness with experiential learning about agricultural practices provides an opportunity for students to develop higher order thinking and problem solving skills, which is often seen as a valuable experience for a future employer (Acker and Scanes, 1998). To effectively train the next generation of agricultural professionals, universities must provide an education that recognizes the global nature of today's societies and develops the skills needed to address issues that are diverse and complex (Jones and Bjelland, 2004).

Study Abroad Summer Course: International Animal Production, Disease Surveillance and Public Health

Course Development and Goals

In 2007, North Dakota State University (NDSU) and Makerere University (Mak) jointly developed MICR 379/793 "International Animal Production, Disease Surveillance and Public Health," a summer course taught in Uganda (http://www.ndsu.edu/dce/classes/study_tours/experience_uganda_study_tour).

This is a unique graduate and undergraduate course that focuses on strengthening global perspectives in agricultural training. The study abroad summer course is a core course for a Master of Science degree and Graduate Certificate in International Infectious Disease Management and Biosecurity and an elective for other graduate programs and professional programs. The course goals are:

- To enable students to appreciate and experience tropical animal production, food safety and public health from a developing country's perspective and
- To provide for global career development opportunities, fostering an international perspective and ability to work and understand diverse animal production, food safety and public health systems.

Course Description and Objectives

The course involves international travel to Uganda for four weeks of experiential learning on topics related to tropical animal production systems; animal health; national control of zoonoses; epidemics/epizootics; biosurveillance and biosecurity; public health practice; and food safety in the tropics in contrast to the US. The course is delivered in a format that involves field trips to sites of interest and lectures given by international experts (including faculty from Makerere University, Kampala, Uganda). The lecture notes are available online to the students during the spring semester for NDSU students and via Distance and Continuing Education (for non-NDSU students). Additionally, MICR 494 "Pre-Uganda seminar series," a prerequisite for the summer course (MICR 379/793) is offered every spring. The seminar series addresses several topics over the spring semester aimed at preparing students for the summer study abroad in Uganda.

At completion of the summer study abroad course, students are expected to: 1) develop an appreciation of tropical animal production systems in a developing country; 2) develop an understanding of unique animal health challenges under tropical conditions; 3) gain knowledge in national and global disease surveillance systems; 4) develop an appreciation of public health and food safety practices in a developing country; and 5) gain knowledge on control programs for important human and animal disease epidemics in a developing country.

Course Requirements, Content and Evaluation

Undergraduate, graduate and non-credit students can participate in the summer study abroad course. There are no required prerequisites. The majors for past students include International Infectious Disease Management, Microbiology, Food Safety/Communication, Animal Science, Veterinary Medicine, Pre-Veterinary Medicine, Veterinary Public Health, Zoology and Microbiology/Biotechnology. The course is available to non-NDSU students who are required to register through NDSU Distance and Continuing Education (DCE) office. Past students came from various institutions including NDSU, other US (Dickinson State University, Valley City State University, University of Minnesota, The Ohio

State University, Kansas State University, University of Tennessee, Oklahoma State University, University of California Davis and Washington State University) and Canadian institutions (University of Saskatchewan) and from East Africa institutions (Uganda, Kenya, Tanzania, Rwanda and Ethiopia).

The topics covered in the summer abroad course are outlined in Table 1. Topics include: international animal production systems; bio-surveillance and biosecurity; delivery of veterinary services in developing countries - the case of Uganda; control programs for important zoonoses in Uganda; global and national control programs for epidemics/epizootics; food safety in developing countries - the case of Uganda; food safety systems in developed countries - the case of the US; delivery of veterinary services in developed countries - the case of the US; animal production systems in the US; and disease surveillance and biosecurity in the US. The summer course evaluation criteria are outlined in Table 2. Parameters evaluated include attendance of presentations and field trips, quiz, written report and a poster/oral presentation.

Course Management and Funding

Enrollment into the summer course program is administered through the NDSU Office of International Programs and the NDSU Distance and Continuing Education (DCE) office. The summer abroad course involves international travel to Uganda and as such has costs associated with the travel. The total cost of the course is approximately $7,000 per student (including program fees, airfare, accommodation, meals, NDSU tuition and fees) (Table 3). Most students use personal funds or loans to meet course costs. Students often conduct fund raising activities to help offset program costs. In the past, NDSU provided scholarships ($1,000 to $5,000 per student) to NDSU students through the NDSU Development Foundation and grant funding from the US Department of Agriculture and the US Agency for International Development (USAID). Past students from other US institutions received up to $5,000 in grant funds from their institutions to offset program costs. Additionally, 2 students from East Africa (Uganda, Kenya, Tanzania, Rwanda and Ethiopia) were funded by USAID through the Emerging Pandemic Threats Program managed by the University of Minnesota.

Pre-Uganda Seminar Series

The pre-Uganda seminar course addresses several topics over the spring semester aimed at preparing students for the summer study abroad course in Uganda. The course objectives are: 1) acquire broad knowledge on a range of topics about Uganda (such as geography, history, culture, politics, education and agriculture) before visiting the country in the following summer;

Table 1. Topics Covered in the Summer abroad Course

Topic	Sub-topic
International Animal Production Systems	• Intensive/Semi-intensive (commercial dairy farming; zero-grazing system) • Traditional Systems (pastoralism, communal grazing, subsistence farming) • Wild Life Production (National Parks)
Biosurveillance and Biosecurity	The role of international and local government agencies in the surveillance and control of trans-boundary diseases of animal and public health importance - the Ugandan experience • Global – OIE (Uganda office-Avian influenza surveillance; Rinderpest vaccination) • Ministry of Agriculture/Directorate of Animal Resources - Uganda experience • Activities of the Center for Disease Control (CDC) in Uganda
Delivery of Veterinary Services in Developing Countries: The Case of Uganda	• National Agricultural Advising Services (NAADS) -Uganda • Meat Inspection Services
Control Programs for Important Zoonoses in Uganda	• Tuberculosis • Trypanasomosis • Brucellosis
Global and National Control Programs for Epidemics/Epizootics	• Pan African Control of Epidemics (Rinderpest, Contagious Bovine Pleuropneumonia, Foot and Mouth Disease) • Control programs for Tick Borne Diseases – (East Coast Fever (Bovine theileriosis), Anaplasmosis, Babesiosis) using dipping (acaricide) method • Control program for HIV/AIDS in Uganda • National malaria control program
Food Safety in Developing Countries: The Case of Uganda	• Bureau of National Standards • Public Health –National Inspection service • Traditional Food processing/preservation
Food Safety Systems in Developed Countries: The Case of US	Federal agencies involved in Food Safety (FSIS, FDA, USDA)
Delivery of Veterinary Services in Developed countries: The Case of US	
Animal Production Systems in the US	
Disease Surveillance and Biosecurity in the US	• The US Centers for Disease Control and Prevention (CDC) • The US Department of Agriculture (USDA)

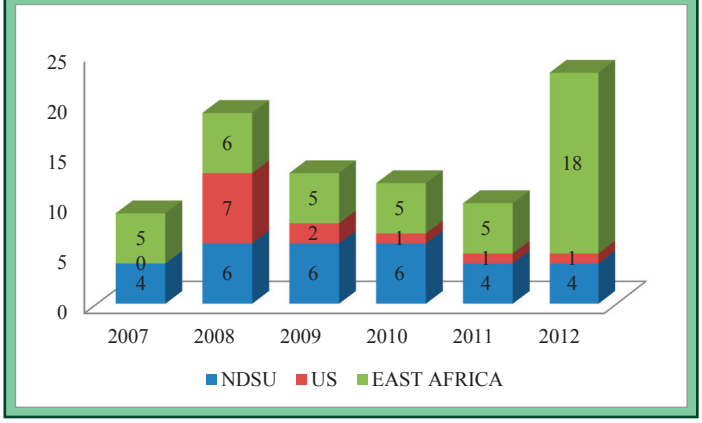
Table 2. Summer Course Evaluation Criteria

Date	Evaluation	Description	Percent of Final Grade
June-July	Class Discussion	Students are expected to attend field trips and afterwards share with the rest of the class what was learnt on the trips.	30%
At the end of the course (July 15)	Quiz	Students will be quizzed on material covered by lectures plus field trips.	30%
By August, 31 (after student returns to their Institution)	Written Report	An overall evaluation of the course including best practices and areas of improvement.	20%
By end of the Fall semester (November to December)	Poster/ Oral Presentation	This can be in form of a poster or oral presentation or seminar to a student club/association, program, scientific meeting. This activity also helps with future student recruitment.	20%

Table 3. Budget for the Summer abroad Course in Uganda

Item	Amount (US$)
Program Fee Expenses Per Student	
Students' share of faculty cost	266.00
Entrance fees (museums, etc.)	100.00
In-house activities: accommodation at Makerere campus and in the field, meals in the field, fees and payments at sites to be visited	2029.00
Facilitator Allowances	550.00
Transportation costs: vehicle hire and fuel	309.00
Meal at Makerere University	32.00
Administrative costs and taxes	210.00
Health Insurance	76.00
Total Program Fee expense per student	3,572.00
Other Student Expenses (non-Program Fee)	
Airfare (if not included in Table 2)	2300.00
Must have Vaccinations and preventive medicines	
Yellow fever	85.00
Group consultation fee (30-60 min; $42/adult)	42.00
Injection administration fee (first shot)	48.00
Malaria prescription (Malaron-6 tabs)	45.00
Travelers' Diarrhea (Cipro)	20.00
Total for Air fare & Must have Vaccinations & Medicines	2,540.00
NDSU Tuition and Fees Per Student	
Tuition for 3 DCE credits (Part-Time undergraduate $269.94 per credit)	809.82
Student Fees ($45.76 per credit)	137.28
Total for undergrad Tuition and Fees	947.10
Total Cost Per Student	
Program Fee per student	3,572.00
Non-Program Fee per student	2,540.00
Tuition and fees per student	947.10
Total program cost per student	**7,059.10**

Figure 1. Students that completed the summer study abroad course in Uganda (2007 - 2012). A total of 86 students trained so far: US = 42 (NDSU = 30, other US Institutions = 12) and East Africa = 44.



2) provide opportunities for students to ask questions regarding the study abroad course and at the same time address any concerns raised by parents; 3) provide an opportunity to interact with and bond with other students that plan to attend the summer course; and 4) provide an opportunity to make arrangements to fundraise for the trip. Additionally, students have access to online course materials for the study abroad program which enables them to focus entirely on the experiential learning while in the field (in the summer semester).

Student Majors and Participation

The study abroad summer course has been extremely attractive to students from NDSU and other US institutions and from a variety of agricultural and biomedical science majors. From 2007 through 2012, a total of 86 students completed the summer course (Figure 1). Thirty of the 86 students were from NDSU, 12 from other US institutions and 44 from institutions in East Africa. Majors at NDSU included International Infectious Disease Management (8), Food Safety/Communication (7), Microbiology (5), Animal Science (4), Zoology (3), Pre-Vet Medicine (2) and Microbiology/Biotechnology (1). Majors at other US institutions included Veterinary Medicine (9) and Veterinary Public Health (3). While 86 students have taken the course over the past 6 years, many more have expressed an interest but were unable to participate for financial reasons.

Experiential Learning Aspects of the Program

In the study abroad summer program to Uganda, students are expected to learn through exposure to various experiences that are pertinent to course objectives. The course has three main objectives which include acquiring broad knowledge on: 1) tropical animal production systems (livestock and wild life); 2) food safety, public health and disease surveillance systems especially transboundary animal diseases and zoonoses; and 3) cultural exposure/ interaction of students. Students are expected to meet these objectives through learning. The format through which students learn goes through five steps as outlined in the experiential learning model modified by 4-H and these are experience, sharing, processing, generalization and application (Norman and Jordan, 2012). At the start of the summer abroad course in Uganda, students are given questionnaires with learning objectives and their prior knowledge assessed and the same is performed at the end of the course. Also, sensitization is carried out at the onset by faculty and this ensures that learner goals are achieved (Norman and Jordan, 2012). Corresponding to the five steps in the model by Norman and Jordan (2012), students participate in numerous activities including: hands-on activities on animal farms and wildlife parks such as darting wild animals and interacting with farmers/ local communities; sharing their experiences at the end of each activity through descriptions of what happened and why it was done; processing those experiences to identify most critical and similar themes; and making generalizations from their personal experiences and understanding the applications of those experiences at other times when faced with similar tasks.

Experience alone does not lead to experiential learning but if a student goes through all the five steps and can apply the learned generalizations in new situations, the success of experiential learning can be ascertained (Norman and Jordan, 2012). Throughout the

summer school, participating faculty constantly interact with students to assess whether these critical steps are being developed. Group discussions with subject experts are held and students are encouraged to ask questions. In addition to the academic aspects of the program, students are given an opportunity to immerse themselves in the culture of the country, an aspect of the program that is usually well appreciated by students. The cultural immersion takes several forms depending on ongoing activities when students are in the country; some may be prearranged and may even include participation in ceremonies such as marriage and cultural dances.

Impact of the Experiential Learning Model

The experiential learning model embraced in this summer abroad course has ensured that students receive more of hands-on experience in agriculture education compared to the traditional classroom approach. This learning approach provides students with critical and problem solving skills which enables them to make more practical and strategic decisions concerning agriculture in their respective countries (Acker, 1999). More importantly, this model appears to achieve its objectives of understanding tropical animal production and its unique animal health challenges, disease surveillance systems and the food safety and public health practices in a developing country. Additionally, through the informal environment provided by field activities, communication between both host and foreign students is enhanced. The interaction of students across multiple cultures promotes diversity, generates an interest in international careers and could be an avenue for future agricultural partnerships and friendship. Furthermore, cultural sensitivity is enhanced and a mutual respect developed among students from various cultural backgrounds. Cultural sensitivity is considered a critical element in global development (Wingenbach et al., 2006).

Benefits to Students

The study abroad program to Uganda has directly benefitted students in several ways. The first benefit is cultural immersion. The program offers students the opportunity to interact with people from different cultural backgrounds, which allows students to develop cultural sensitivity. Cultural sensitivity is valued by employers; therefore acquisition of this attribute is vital in the job market. Most companies especially those targeting a worldwide audience prefer professionals that have a cross cultural exposure (Association of American Colleges and Universities, 2007; Unruh-Snyder et al., 2011). Second, pre-professional students have greatly benefitted from the course. The summer course experience has set them apart and given them an edge over their colleagues as they compete for admission to professional colleges of veterinary medicine and medicine. In addition, while in Uganda, pre-veterinary medicine and veterinary medicine students from different schools often interact and share valuable experiences related to interview skills and the veterinary program. A third benefit is the opportunity to observe firsthand the challenges and need for an integrated strategy to disease prevention and control and the value of promoting One Health nationally and globally. This is achieved through various activities including visitations of national parks, farms and clinics where disease control, public health and food safety challenges are observed and discussed. Finally, other benefits of the program include tourism, improved communication skills across cultures, changed stereotypes and development of lasting friendships.

Challenges

The summer abroad course in Uganda has faced a number of challenges in its attempt to promote experiential agricultural learning. The most significant challenge is financial constraints. For example, there have been a number of American students that are interested in the summer course but have been unable to participate because of inadequate financial support. In the past, NDSU has provided scholarships ($1,000 to $5,000 per student) to NDSU students through the NDSU Development foundation and grant funding from USDA and USAID to help offset program costs. Recently the study abroad to Uganda program was awarded a grant by the NDSU Development Foundation to fund five students ($1,000 per student) for the 2013/2014 summer course. The contribution by NDSU shows that financial aid can be sought from various institutions to offset costs so that more students can enroll into the course. Another major challenge is skepticism by students with regard to variable factors such as cultural shock, fear of social integration, safety and health concerns, insufficient support from family, homesickness, language barrier, fear of the unknown and time and climate differences. The program alleviates these fears and concerns through information sharing and addressing questions and concerns from students and parents during the Pre-Uganda seminar series. During the seminar series, alumni of the summer course are also invited to share their experiences with prospective students and to help with recruitment efforts.

Student Comments

At the end of the summer abroad course to Uganda, students are required to write a report on various aspects of the program including experiences that were beneficial, inspirational, eye- opening, most and least enjoyable

and challenging. Comments on these aspects provided by past students are shared below. Most students had never been to Africa or a developing country, as a result the summer abroad experience in Uganda appears to live a long lasting impression on students.

"*This class was more than a learning experience; it was a life changing experience*" - Pamela Fry, summer class of 2008.

"*Traveling to Uganda for international study proved to be an invaluable and unforgettable learning experience*" - Daniel Montonye, summer class of 2008.

The hands-on approach of the summer abroad course was well received by students. *"The program was full of hands-on experience and not just reading textbooks and looking at pictures. The trip was hands-on right from the start and I appreciated that most of all"* - Melissa Rae Ben, summer class of 2010.

Several eye-opening and inspiring moments were described by past students. Students observed how people in Uganda are able to live on little to no resources and were amazed at how people are able to live happily with very little.

"*I was amazed at how effectively a family in Uganda can use a cow or a flock of chickens to provide for many meals along with providing them income*" - Brenton Nesemeier, summer class of 2008.

A second eye-opening moment was exposure to the different types of local animal production systems including zero grazing and communal cattle grazing. Zero grazing is a type of livestock management system where animals such as dairy cattle are kept in an enclosed, shaded area and fodder and water are provided instead of letting them graze on open pastures. Zero grazing system is commonly used and promoted in developing countries by the US-based non-governmental organization, Heifer Project International. Students from the US were aware of Heifer Project International activities but had never seen a zero grazing farm.

"I did not realize before the visit how Heifer farms can be used as demonstrative farms for the surrounding areas and how others can catch the vision just by Heifer Project having a presence" - Erin Harris, summer class of 2008.

Students also observed for the first time what a communal cattle grazing systems looks like. *"It was so amazing to see cattle with different owners walk off to the same area and graze together. The idea of having common land used for the good of all was simple and amazing to see"* - Pamela Fry, summer class of 2008.

A third eye-opening and inspirational moment was the number of animal disease challenges in a tropical environment. Students learned that several human and animal pathogens were endemic to Uganda and most were absent or considered exotic in the United States. "*I was unaware of the extent which many of these 'exotic' diseases are a problem in Uganda, especially tick borne disease*" - Laura Kiehnbaum, summer class of 2008.

"*This class has opened my eyes to the various issues and challenges existing in developing countries and sparked my interest in worldwide issues in food safety/ public health*" - Erin Slinden, summer class of 2009.

A fourth eye opening moment was experiencing what it means to live in an environment with a less strict organizational structure. *"Living in a country different from my own provided the opportunity to learn from the local people, such as how to be a little less structured and a little more flexible and to discover that I could make it even when things did not go exactly as planned or as preferred"* - Melissa Rae Ben, summer class of 2010.

Numerous most enjoyable moments were shared by students, some of which were inspiring as well. Visits to wild life national parks were regarded as one of the most enjoyable moments. Students enjoyed the park experience because they were able to get up-close-and-personal to wild animals to observe and participate in procedures such as tranquilization and post-mortems. Some students had only seen wild animals in zoos and were amazed to see the diversity of wildlife in the parks. Students enjoyed learning about societal and health problems at the wildlife-domestic animal-human interface.

"Getting a better understanding of the challenges the parks face in relation to diseases and with the pastoralists was fascinating. The time spent watching and working with the animals and people in the parks was also something I will remember for all my life" - Daniel Montonye, summer class of 2008.

"*Knowledge about interface problems in the parks and the villages sparked an interest in me on issues in wildlife conservation*" - Kristi J. Falk, summer class of 2010.

A second most enjoyable moment was visitation of cultural sites. Visiting the cultural sites, as well as being able to converse with Ugandan students, faculty, local famers and citizens helped students get a broad understanding of the course.

A third most enjoyable moment was the opportunity to meet students from other universities in the US and Africa. Students participating in the summer course come from different universities and cultural backgrounds. Time spent with other students allows them to share a wide range of issues about life and their countries and develop lasting friendships.

"*This time helped me appreciate our similarities and differences better than I could from any lecture*" - Pamela Fry, summer class of 2008.

"*Whether they are from NDSU, Makerere, or another university, I know that we will be bonded for life after this experience*" - Melissa Quam, summer class of 2008.

Finally, students shared their least enjoyable and challenging moments. A cultural shock was experienced by some students upon realizing that time management was not strictly observed in Uganda.

"*Ugandan time is very hard to get used to when one is used to every moment of every day being scheduled and on time, if not early*" - Kristi J. Falk, summer class of 2010.

Transportation conditions particularly traffic and driving were another least enjoyable moment. Traffic flow in Uganda's cities is not as organized when compared to cities in developed countries. Students from the US were thus concerned about road safety.

"*Clearly transportation is something that is unavoidable and as long as everyone stays safe it is part of the culture and an experience*" - Erin Harris, summer class of 2008.

Recommendations

In spite of the success of this model so far, there are several elements that need to be addressed to further improve course delivery. First, there is a need for faculty to articulate better the benefits of an international experience in a developing country and the career opportunities that the program offers. Second, when considering a study abroad experience, students should be encouraged to broaden their choice of place and include non-traditional destinations such as developing countries in Africa. Third, there should be more collaboration among institutions to avoid duplication; a consortium of institutions could develop one study abroad course led by one of the institutions. This would ensure that adequate number of students participate which would lower the cost of the program per student and help with sustainability of the program. In addition, a consortium of institutions approach would allow sharing of resources such as faculty. Finally, institutional support for faculty-led study abroad programs should be encouraged and rewarded.

Conclusion

Through the years, this study abroad experience has exposed students to learning about agricultural practices in a developing country through experience-based approaches. Students learn about the difficulties and challenges to agriculture systems; such knowledge is critical for development of improved and novel agricultural practices. In addition, the international aspect of this course fosters global awareness and may facilitate future collaborations, all of which may contribute positively to solving agricultural problems of a global nature.

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