

AC 2009-83: PARTNERSHIPS FOR SUSTAINABLE DEVELOPMENT AND INTERNATIONAL EDUCATION

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WATER : A Model Partnership for Sustainable Development and International Education

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Abstract

West African Technology, Education, and Reciprocity (WATER) is an interdisciplinary study abroad experience that focuses on the development of sustainable water and health-related resources in Benin, West Africa. The WATER program is a partnership between the Songhai Centre in Porto Novo, Benin, James Madison University, and Gonzaga University. The course has been built around a consultative model of engagement: the Songhai Centre identified their needs and the professors and universities developed course content and projects to respond to these needs. The goal – and challenge – is to meet community-identified needs while still providing a meaningful and credible educational and cultural experience for a diverse group of students.

This paper describes the design, development, and implementation of this interdisciplinary study abroad experience. The authors explain how the course is organized to capitalize on the talents of students from multiple diverse majors. Site selection considerations, evaluation procedures, and lessons learned also are described.

Introduction

Study abroad opportunities have increasingly become an expectation in higher education. More than half of incoming students intend to have some type of study abroad experience during their undergraduate education – and their parents are encouraging this. Additionally, accrediting bodies and employers are recognizing the value of such an experience. For example, the Accrediting Board for Engineering and Technology (ABET) has stated that engineers should exhibit an awareness of global conditions and circumstances that may influence the design process. Similarly, the American Association of Colleges of Nursing (AACN) identifies global awareness and intercultural competency as essential outcomes for graduates of baccalaureate nursing programs.¹ Professional accrediting organizations also are placing increasing emphasis on interdisciplinary education and collaboration. Study abroad experiences also take students outside of their typical comfort zones, allowing them to stretch and grow in ways that are just not possible on campus. For some students, such experiences may trigger interest in career opportunities with service or non-governmental organizations that focus on engineering, health, education, and development needs in the US or abroad. In spite of encouragement and the desire of students to participate in study abroad experiences, in fields such as engineering and nursing with very stringent accreditation requirements, prescribed courses, and heavy course loads, students have difficulty fitting a typical study abroad experience into a their schedule. WATER

is offered as a summer course with a short-term study abroad experience, which increases its accessibility to students in professional programs.

Benin is a West African country of approximately 8.5 million people, nearly a third of whom lack access to potable water. Mortality rates, especially for infants and children in Benin, are much higher than mortality rates in the developed world and most deaths in children under age 5 are caused by water-related diarrheal illnesses.² The United Nations Millennium Development Goals address these problems of developing countries, as well as others that form the very foundation of a healthy, productive, and politically stable society. While these goals go well beyond what one simple program can address, the goals do highlight important connections in international development, in the hopes that development can be sustainable. Specifically, goal #8 calls for the formation of global partnerships for development.³ Over a period of three years, a service-learning based educational experience was developed to address some of the needs in Benin, while simultaneously meeting the demands of students for study abroad opportunities. The WATER program is congruent with goal #8 and models for students the value of interdisciplinary and interprofessional relationships.

The WATER program has been designed foremost as an academic service-learning course that would be a technical elective within the student's major (in this case engineering and nursing). The course was designed to accommodate students who returned home and worked over the summer or who had a limited vacation schedule, such as nurses enrolled part-time in a graduate nursing program. Finally, the service-based part of the course was designed to allow the students in the course to directly address the needs identified by the Songhai Centre.

Developing the Study Abroad Experience

Developing any study abroad experience involves consideration of both academic issues and more comprehensive programmatic issues. The latter encompasses logistical issues, housing and transportation issues, possible student life and safety considerations, and excursions that are to be included as a part of the experience. These two components inform one another: for example, course objectives may call for including one type of excursion or offering the experience in a specific locale, but weather, road conditions, and access to emergency services may limit some choices. The challenge with developing any study abroad experience is to develop a program that is educationally credible, meaningful to students from the target discipline, exposes students to the culture of the chosen site, and is safe. These challenges are multiplied when the intended student audience is from multiple disciplines and when the study site is a developing country.

Getting Started

The WATER course grew out of an Engineers Without Borders (EWB) project. A trip to Benin to investigate the feasibility of introducing ceramic water filter technology to a local community led to identifying the Songhai Centre as a suitable partner for the project and a suitable site for a study abroad experience. This trip proved to be crucial for gathering the information that would

be needed to convince university officials about feasibility and academic integrity of the proposed course, as well as the appropriateness and safety of the proposed site. (Development of the technology transfer aspects of the WATER course is described in another paper.)

This preliminary trip to Benin also led to the realization that introducing water filter technology and mastering the skills needed to manufacture the water filters would not be enough to ensure their success. To be effective and really help improve the health of Beninese citizens, the water filters would need to be purchased. Convincing the Beninese citizens to purchase the water filters would require providing education about why the filters are needed, how they work, and how to use them correctly. This meant the project would need to include health education and health marketing, as well as engineering technology. The idea to make the WATER course interdisciplinary in nature arose from this insight. Conversation with faculty colleagues resulted in identifying the Department of Nursing and the Teaching English as a Second Language (TESL) program as appropriate academic partners for the program, the latter because the official language of Benin is French but the Songhai Centre requested that teaching be done in English so that their workers could develop English language skills. Once the appropriate partner academic disciplines were identified, the appropriate faculty members needed to be selected. The faculty member from nursing was chosen because of her background in population health and her experience with study abroad programs. The faculty member from TESL was chosen because she speaks French and had Peace Corps experience in Africa. Of course, compatibility of values and personality also were important factors.

While the needs identified by the Songhai Centre seemed to demand an interdisciplinary approach to the WATER project, an interdisciplinary approach was embraced for academic and experiential reasons, too. Students in professional programs such as engineering and nursing tend to become isolated because of the intense nature of their programs; this can cause them to develop the mindset that their discipline can solve problems unilaterally. In reality, though, complex programs require the knowledge and skills from multiple disciplines. We wanted to introduce this idea to students and provide them with experience working and learning to communicate with colleagues from other disciplines.

Course Development

The course development process began about 15 months before taking the first group of students to Benin. The proposal needed to be approved by various committees and administrative groups and we needed to have every indication that the experience would be approved before we could start marketing the program and accepting applications. Course development encompassed the usual curricular decisions about course description, course objectives, course content, teaching-learning strategies, and course requirements and evaluation processes.

Course vision and description

The course development process began with discussions about shared goals and values. Faculty agreed the course would be built on the core values of responding to community-identified needs, reciprocity, sustainability, cultural appropriateness, and mutual respect. The course would meet the criteria established at the university to be designated as a service-learning course. It would fulfill the technical elective requirement in the engineering program, meet an elective requirement in the TESL program, and fulfill the epidemiology component of the community health course in the BSN program. Graduate (MSN) nursing students could use the course to meet some of their required practicum hours or elective credit. Students in other programs could work with their advisor to determine the best use of the course for their program of study. Based on needs identified by the Songhai Centre and the knowledge and technology that was central to addressing these needs, we agreed that the course would need to include content in water purification technologies, epidemiology, principles of health education, principles of language acquisition, social justice, and Beninese history, current social issues, and culture. These discussions led to agreement on the following course description:

WATER (West African Appropriate Technology, Education, and Reciprocity) is an interdisciplinary course with a three-part focus: cross cultural training and in-depth study of West African culture, study of health conditions and health promotion in developing countries, and epidemiological research designs and their practical application using appropriate technologies for eradicating water-related illnesses in Benin, West Africa. Students will work in multidisciplinary project teams and use course content as the foundation for developing and implementing educational interventions. This course is a service-learning course and addresses issues of social justice in West Africa, including but not limited to health interventions, discussions of contemporary third-world development, exploitation, and a critical examination of political and economic conditions affecting individual and population health in “periphery” nations.

Course objectives

The course objectives were developed with action verbs that indicated expected learning outcomes in the cognitive, psychomotor, and affective domains. Specifically, it is the intent that, upon completion of the WATER course, students are able to:

1. Describe contemporary health problems in West Africa and their contributing factors.
2. Describe the relationship between water, sanitation, and causes of morbidity and mortality in West Africa.
3. Demonstrate communication skills for providing culturally appropriate health education.
4. Demonstrate cultural competency in working with indigenous populations
5. Articulate an understanding of principles and appropriate technologies for water and sanitation.
6. Assess and evaluate water quality.
7. Apply principles of epidemiology to the design of an evaluation plan for a water and sanitation project

8. Articulate social justice issues associated with health and health interventions in emerging nations.
9. Prepare and implement health and engineering content for Benin junior high and high school students in English
10. Articulate basic principles of second language acquisition as they apply to Benin educational contexts.

Course design

Based on these course objectives and decisions that had been made about the duration of trip to Benin, we decided to assign the course 4 semester credits (3 credits of theory and 1 credit of practicum or application or lab hours). The course objectives were judged to be consistent with what would be expected for a “heavy” 3-credit course during academic year. Forty-five hours of lab (practicum) over a full 15 week semester is typically assigned one credit; we estimated that students would easily be involved in 45 hours of lab or practicum experience through pre-trip preparation activities and their work in Benin. We had already decided that the actual time in Benin would be limited to approximately two weeks. This decision was made partly on the basis of cost considerations and partly on the desire to accommodate other obligations that students and faculty have during the summer. Additionally, one instructor’s previous study abroad experiences with students in developing countries suggested that students begin to get restless at the end of two weeks, and this can precipitate student life issue. Finally, because travel was to occur during the first two weeks of August in order to avoid Benin’s rainy season, limiting travel to two weeks would give students (and faculty) about two weeks back home before fall semester classes started. A further advantage to limiting travel time to two weeks is that the most worrisome illnesses associated with travel to Benin (i.e., malaria) typically have incubation periods of longer than two weeks, so students would be home before they developed symptoms.

Course content

The course content flowed readily from the course objectives. We developed modules or units of content and identified readings that addressed the water crisis in Africa; contemporary health problems in West Africa and their relationship to water; engineering interventions for health improvement; principles of sustainability; paradigms for development; the UN Millennium Development Goals; basic epidemiological measures and study designs; principles of public health; principles of health education; West African history, culture, and current issues; health marketing; world Englishes; and principles of language acquisition. Many of the readings to support these content areas came from on-line sources and we constantly added references even while the course was actually underway. We decided early on that the didactic (i.e., theory) component would be completed before travelling to Benin and offered using online (Blackboard) technology. This provided maximum flexibility for students, many of whom were not on campus during the summer and were balancing jobs with their coursework.

Course assignments

We designed course assignments that are intended to validate students' completion and thoughtful consideration of how each unit's content linked to the projects that are a part of the WATER program. We wanted students to be ready to "hit the ground running" armed with background knowledge since we would not be holding class sessions in Benin. Each unit of content required completion of a study guide. Other course assignments have included development of a teaching plan; participation in teaching water testing and filter manufacturing activities; and reflective journaling. Students were assigned to interdisciplinary groups to develop and implement teaching plans. These plans were developed before travelling to Benin, reviewed by course faculty, and revised as needed. Students also could negotiate individualized projects with the instructors.

The reflective journaling assignment has proven to be particularly valuable. Students were provided with clear guidelines regarding the number and timing of required journal entries, as well as topics/issues on which to focus. The second year, we also provided students with a journal so that they would have no excuse for not being able to complete their journal entries while in Benin. What we found is that most students journaled more frequently and comprehensively than was required. The course faculty took turns reading students' journals and responding to their comments. Students were assured of the confidentiality of their entries and were asked to grant permission to use anonymous excerpts from their journals in marketing materials and publications. The journaling requirement consisted of a minimum of five entries that were to address, at a minimum, the following topics:

1) Pre-trip expectations.

- What expectations do you have for yourself, your group and your interaction with your group, and the course?
- What preconceived ideas do you have about Benin? About our project?
- What are your thoughts about the relationship between water issues, health issues, poverty, and social justice?
- What are your thoughts about how language issues enter into issues such as water needs, health issues, poverty, and social justice? What are some ideas that you have about the connection between language and power? What does language and choice of language have to do with social justice?
- How do you think you are going to react to this whole experience?

2) Initial impressions – within our first 48 hours in Benin

- What are your initial impressions about Benin?
- Which of your preconceived ideas seem correct – and incorrect – so far? What do you think explains any incorrect expectations?
- What do you think about your responses to this experience? Are you surprising yourself in any way? If so, how?

3) Changed impressions at the end of week 1

- Are your impressions of Benin and our project changing in any way? If so, how?
- What new insights are you gaining into the Beninese culture and the impact of Benin's history on its current state-of-affairs?

- Are your pre-trip thoughts about the relationship between water issues, health, poverty, and social justice changing in any way? If so, how?
- Any new insights into language issues, such as the value of teaching English in a setting such as Benin?
- How are you changing as a result of this experience?

4) Changed impressions at the end of week 2 – same questions as for week #1

5) Reflections on re-entry – after your first week back home

- What was it like to re-enter your family and home community?
- How are you describing and explaining your experiences to others?
- What new insights have you gained as a result of this experience?
- Did your pre-trip metaphor hold up? Why or why not? If you were to select a new metaphor to describe this experience, what would it be (and why)?

While the course modules appear to focus on discipline-specific content, the cross-disciplinary value of the content was emphasized and students were expected to address this as they completed each module's study guide. For example, in the epidemiology module, students were asked to identify an appropriate epidemiological research design for evaluating the effectiveness of the water filters. The modules also provided students some pre-trip practice in teaching. A Blackboard discussion forum was set up for questions related to each module's content and we found that the students, rather than the instructors, took the lead role in clarifying content for one another. Engineering students explained water technology principles to nursing students and nursing students helped engineering students interpret different epidemiological concepts.

Table 1 (at the end of this paper) links the course's learning activities to the course objectives.

Program Development –

In many respects, developing the academic component of a study abroad experience is the less complicated part of putting together a study abroad experience because it involves considerations with which most faculty are familiar. "Program" development encompasses all of the other considerations that are a part of taking students to a study abroad location: where students will stay, what they will eat, whether the water is safe, how they will get around, what excursions the trip will include, what health and safety risks need to be planned for, and so on. All of these considerations have implications for program cost and the ultimate success or failure of the experience.

The capabilities of the international partner were paramount in the ability to develop the more comprehensive programmatic aspects of the WATER program. The Songhai Centre provided an outstanding example of sustainable development in their existing infrastructure. The Centre also provided reliable communication, acceptable accommodations, classroom and

meeting facilities, safe transportation, food, access to water, and familiarity with local health care resources. Additionally, Benin, in particular the area surrounding the Songhai Centre, is a safe and politically stable location for travel. All of these conditions could perhaps produce an interesting study abroad experience. What has made the WATER program life-changing for the students involved has been the ability of the Songhai Centre to identify their needs in water and health care and to enthusiastically embrace the educational initiatives designed by the students in the class.

Most colleges and universities that offer study abroad experiences will have established criteria for a program site. For WATER, the pre-program “reconnaissance trip” that had been done as a part of developing the EWB project proved to be essential for being able to provide university officials – and students and their parents – with the information they needed to feel comfortable about a study abroad experience that would take place in a developing country that most people have never heard of. Among the questions that we needed to be able to address in order to get administrative approval for the program were:

- How would students get to the program site?
- How would they get from the airport to where they would be staying? What are the conditions of the roads they would be travelling on and the vehicles they would be traveling in?
- What will accommodations be like? Are they safe?
- What will students eat? Are food preparation and storage practice safe?
- Is the water potable? If not, what provisions will be made for safe drinking water?
- What types of health and safety concerns are there? How would students access health care, if needed?

Examples of the types of additional questions that students and their parents have had are:

- What types of bathroom facilities are there? Is there hot water? Electricity? Will students need to provide their own bed linens or mosquito nets?
- What is the food like?
- What type of clothing is appropriate?
- How much money will I need to bring along?
- What immunizations are needed?
- What other medications should students be advised to bring along?

We answered many of the student questions by developing a series of handouts on “travel tips.” We also set up a Blackboard discussion forum that we encouraged students to use for asking questions.

In addition to addressing these types of concerns, we wanted to be pro-active about health and safety issues -- the types of “student life” concerns that can destroy even the most carefully designed program. We developed clear guidelines about using the buddy system, letting the instructors know when you were leaving the Songhai Center, not going outside of the Songhai Centre after dark, not eating food purchase on the street, alcohol use, and absolutely not driving or riding on one of the many motor scooters that are the primary means of local transportation in Benin. We also developed very strong recommendations about handwashing, dressing to avoid contact with mosquitoes and harrassment, wearing closed toe shoes to avoid foot injuries, and preventing dehydration and heat exhaustion.

Excursions were planned throughout the course. Benin has a little-known and rich history and we believed that exposing students to points of historical and cultural interest would provide them with insight into barriers that need to be overcome if a new technology such as the ceramic water filters is to be adopted by the population. These experiences also would provide students with insights that would make their teaching more culturally-appropriate. The local market was within walking distance of the Songhai Centre. We introduced students to the market and the surrounding neighborhood on the second day of the trip so that they would feel comfortable going there in small groups and simply observing, soaking in the culture, and talking with people. Another short excursion was to a local village where traditional drums are made; this gave students the opportunity to see a typical Beninese village. Other excursions tended to be day-long events. Because the travel associated with these could be tiring, we scheduled these at intervals of two to three days.

Budget

Working with our partners at the Songhai Centre was critical to planning and budgeting for the program. In this program, the faculty costs (including the faculty airfare) were funded by the students’ program fees. Students were responsible for their own airfare, but flight information was provided to them. Since there are not daily flights into Benin, all students were required to be on the same entry flight. Students also were responsible for their immunizations and visa fee. The program fee covered tuition, room, board, in-country transportation costs, and the use of classroom facilities at the Songhai Centre. The Songhai Centre provided transportation, lodging and all meals. This was of great assistance, since it simplified the budget and meant only one international monetary exchange was required. Reimbursement processes were used for incidental costs, including guide fees and small supply items. In 2007, faculty stipends and airfare consumed approximately 40% of the budget; 40% of the budget went to the Songhai Centre for lodging, meals, and transportation; and the remainder was used for faculty support and incidental costs.

Program Implementation

Program implementation began with a mandatory Saturday orientation session. This session allowed students to meet one another and the faculty before travel to Benin and to have many of their travel-related questions answered. They also were introduced to the water filter technology; learned water testing procedures; engaged in discussions about culture, language, and health issues in West Africa; and were introduced to the online course modules. The day ended with a “no-host” dinner at a local restaurant.

The online component of the course has gone smoothly, although most students find the modules to be more time-consuming and rigorous than they had expected. Faculty also have discovered that the time commitment is greater than they had anticipated. Sending out weekly announcements, updates, and reminders via Blackboard proved to be an effective means of facilitating travel logistics and keeping students on track with the preparation they needed to do for their travel.

Once we were in Benin, flexibility or, as one faculty member was fond of saying, “embracing ambiguity,” was essential. Although we had worked with Songhai Centre to develop a schedule in advance, things had a tendency to change once we were there. Sometimes this was because of weather, sometimes this was because of other events and priorities that came up at the Songhai Centre, and sometimes it was the result of simple misunderstanding and incomplete communications. We learned the challenges of communicating with individuals who do not speak English as their native language. We also began to realize the impact of different cultural values related to time, planning for the future, and urgency of actions. We captured these cultural differences in the phrase, “This is Africa...”

Each day began early, with breakfast at 7:30. Mornings were typically spent in project-related activities such as water testing, working with the water filter team, putting finishing touches on teaching sessions that would be held later in the day, or conducting health surveys. Lunch was around 1 pm, followed by the Beninese version of “siesta” until around 3pm. The remainder of the afternoon was spent holding our teaching sessions, with excursions to the market or soccer games with some of the interns at Songhai Center, or on shorter more local excursions. Because Benin is so close to the equator, it is dark by 7 pm and we wanted students back to the Songhai Centre by then. Dinner was around 7:30 pm and an evening reflection session usually followed. Again, flexibility in the day’s schedule was important. We made sure that we were able to take advantage of experiences that came up because of our relationship with Songhai Centre or as a result of previous contacts we had made. Flexibility enabled students to take advantage of opportunities to spend time with a Peace Corps volunteer who was stationed in Benin, a UN representative to Benin, representatives from a Beninese NGO that is involved in health and social development projects, and a Beninese poet/author.

The evening reflection sessions provided a valuable opportunity for students and faculty to process the day's events. Discussions centered on topics such as feeling like an outsider, social justice issues, and cultural experiences. We also developed the practice of letting different groups of students lead some of the discussion sessions. For example, one evening the business students in the class talked about challenges and strategies for marketing the ceramic water filters. Another evening, the nursing students talked about health threats they had observed while walking around the neighborhood. On a third evening, the engineering students talked about engineering needs and challenges in Benin. Occasionally, the evening reflection sessions ended with drum lessons by some of the interns who were staying at Songhai Centre.

Evaluation

Student assignments in the form of study guides and quizzes for each online module of content provided evaluation evidence of meeting the course's objectives. Results of water testing providing evidence of the technical success of the water filters; these findings are described in another paper.⁴ We developed a survey tool that we administered on-line in order to access student feedback about almost every aspect of the program – value of course content, relevance of course activities, teaching effectiveness, helpfulness of course instructors and pre-trip preparation, value of the excursions, satisfaction with arrangements at the Songhai Centre, perceptions of safety, and so on. Ratings indicated overwhelming student satisfaction in all of these areas. Course activities that had a hands-on component (e.g., water testing, teaching, working with the filter team) generally received slightly higher satisfaction ratings than did the theoretical components of the course, but this is no surprise considering the applied nature of the participants' majors. The most valuable evaluation input, however, came from narrative comments to open-ended questions on the survey tool and from excerpts from student journals. These comments confirm that the experience is life-changing:

“I have gained perspective into my major.”

“I was pushed outside of my comfort zone and had to learn to solve problems and think about things differently.”

“Paradigm shift – we are all one world.”

“[The most meaningful part was] taking information and using it to improve lives.”

“I learned about myself and new career paths.”

“I need/want to go back in the Peace Corps.”

To date, evaluation of other dimensions of the WATER program has been limited by time and resources. We have stayed within budget and even provided a small return to the university. The fact that neither students nor faculty have suffered any severe illness during our travels speaks to the safety of the Songhai Centre as site for the WATER experience and to the completeness of

faculty preparation and student orientation. In the future, we would like to incorporate more formal assessment of changes in students' beliefs and values related to such issues as tolerance for and comfort with cultural differences and diversity, and commitment to sustainability, environmental activism, and social justice. We also plan to review the findings of post-graduation surveys of WATER alumni in order to determine the impact of participation on their career decisions, pursuit of graduation studies, and involvement in community activities related to social justice and sustainability issues.

Sustaining and Institutionalizing the WATER Program

When the WATER program was first implemented two years ago, the involved faculty worked at the same institution. This institution (GU) has a growing interest in providing service-oriented study abroad experiences, especially in Africa. The institution articulates a commitment to WATER, but the program is currently self-supporting. Additionally, as the institution develops more study abroad opportunities, these various programs compete for the same group of students who have the financial means to participate in a program like this. The fact that one of the founding faculty members is now at a different institution (JMU) expands the potential pool of students for the program and will help sustain WATER. Discussions are currently underway to determine how to manage the cross-country collaborative relationship between the two universities in order to best support the program.

Efforts also are underway to include faculty from other academic disciplines from both institutions in the WATER program. This will serve several needs that will further help sustain the program: (1) it will introduce more faculty to Songhai Centre and the project, these faculty can, in turn, make their students aware of the program; (2) it will develop more diversity in the types of interdisciplinary projects and studies that can be incorporated into WATER; (3) it will provide "back-up" faculty so that faculty can rotate teaching and management responsibilities for WATER; and (4) it will provide additional resources for meeting the evolving needs identified by the Songhai Centre community. This summer, faculty from the departments of chemistry and ceramics will be joining us for the WATER program.

Finally, the current economic climate creates challenges for WATER, as it does for all other study abroad programs. We realize the securing sources of external funding for student scholarships and to defray program expenses facilitates the long-term sustainability of the program. We are continuously searching for foundation and federal funding opportunities that support efforts such as this, and we have become committed speakers and fundraisers at community service groups such Rotary and Kiwanis.

Conclusion: Lessons Learned

Our experience with developing and implementing the WATER program has taught us valuable lessons about ourselves and our students and how we can interact and learn with members of other professions and another very different culture. It has taught us that everyone –

students/professions from a wide variety of backgrounds and interests – has something they can contribute to this type of learning experience. We learned that perhaps our most profound role as course faculty is that of being a role model. We took very seriously our need to model the core values upon which the course was built and to model respect for one another as colleagues and professionals. We also have learned some very practical lessons that we believe can be helpful to other programs that are developing this type of experience.

First, visiting the proposed study site before beginning the course and program development process is essential. It will help you gather information that will facilitate course planning, approval, and budgeting processes, as well as reassuring parents. It will arm you with information that you can use to help prepare students for the cultural differences and the challenges they will encounter at the study site. We believe a partner/site like the Songhai Centre is ideal. It helps insure safe and acceptable housing, food, transportation, and access to emergency services. It also simplifies budgeting and payment processes. Finally, it allows for prolonged day-to-day contact with members of the community so that true learning and cultural exchange can occur.

Secondly, we learned that communication is essential. It needs to be regular and ongoing with representatives of the study site, university administrators, and students, as well as between members of the faculty team.

We have found there are real advantages to “front-loading” the academic component of the study abroad course so that students arrive at the study site with some knowledge and tools. This helps them take full advantage of the experience and build relationships right from the start. It also shortens considerably the in-country orientation and familiarization process. On-line teaching technology and strategies are an effective way of providing the academic piece of the course.

We also have learned that there is no need to be intimidated by language differences. While it was helpful to have one of the faculty members be fluent in French during our first year in Benin, during the second year we found that we really got along just fine without this. A couple students spoke some French – and most Beninese citizens know at least some English, which they very much want to practice. Additionally, gestures and drawing pictures are good communication strategies for students to learn – after all, even different professions speak different “languages” even when all speak English.

We found time and time again that flexibility is essential. Students and faculty need to be screened for this attribute. The phrase “this is Africa” is not meant to be derogatory in any way, but time has different meanings in different cultures. Getting “uptight” about last minute changes in plans can ruin the experience.

We also have found that a semi-structured journal assignment is extremely valuable and consciously set aside time during the trip for journaling activities. The journal assignment was facilitated by providing students with something to write in and by outlining minimum

requirements and due dates. Journaling helps students' process issues that they might be uncomfortable verbalizing with their classmates. Thoughtful, respectful, confirming, and confidential faculty feedback, as well as posing additional issues for students to consider, further facilitated meaningful journaling.

We also have grown to realize how important it is that the faculty team have mutual respect, good communication, and complementary styles. In short, the team needs to get along. For us, the ratio of one faculty member to six students seemed comfortable. We also believe it is important to have one male faculty member and one female faculty member. We are strong advocates of an interdisciplinary course and faculty representing different disciplines.

Finally, we have come to realize just how important it is to have a real passion for the project. In our institutions, there is little in the way of support for developing and directing these types of programs – it falls to the faculty and is over and above teaching and other responsibilities. If you begrudge the work, it is going to show in the quality of the product and the student experience. At the same time, it is important to build your budget so that you receive the remuneration that you feel is warranted for your time and effort.

Those of us who have had the privilege to be involved in the WATER program would agree that it has been a profoundly enriching professional and personal experience. It has influenced our teaching and fueled our scholarship. Each year is different because the Songhai Centre articulates different needs – this means continuous course refinement. We are looking forward to returning to Benin in Summer 2009 with our third very diverse cohort of students and the third version of our course.

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Table 1. WATER Course Objectives, Learning Activities, and Student Ratings of Effectiveness

Course Objective	Pre-trip immersion activity	In-country immersion activity	Assessment strategy	Students' rating of effectiveness (5-point rating scale, with 1 = highly dissatisfied and 5 = highly satisfied)
Describe contemporary health problems in West Africa and their contributing factors.	<p>Read "The Water Crisis" from <i>Healthy Water</i> by Mike Magee.</p> <p>Review WHO health statistics comparing Benin and the US.</p> <p>Complete study guide.</p>	<p>Tour of Songhai Centre and Songhai Centre mission presentation.</p> <p>Visit to rural health clinic.</p> <p>Conduct health surveys with Songhai Centre staff and interns.</p> <p>Evening discussions.</p>	<p>Study guide</p> <p>Journal entries</p>	<p>Mean = 4.6</p> <p>Median and mode = 5</p>
Describe the relationship between water, sanitation, and causes of morbidity and mortality in West Africa.	<p>Read "Water and Health" from <i>Environmental Health from Global to Local</i> by Howard Frumkin.</p> <p>Read "Effects of Microbes on Human Health" from <i>Environmental Biology</i></p>	<p>Water sampling and analysis.</p> <p>Conduct health surveys of Songhai Centre staff and interns.</p>	<p>Study guide.</p> <p>Journal entries.</p>	<p>Mean = 4.6</p> <p>Median and mode = 5</p>

	<i>for Engineers and Scientists</i> by Vaccari. Complete study guide.	Language skills workshop with Songhai Center staff and interns.	Formulation of lesson plan. Conduct teaching sessions on health and first aid content.	Mean = 4.6 Median and mode = 5
Demonstrate communication skills for providing culturally appropriate health education.	Read module materials on principles of health education from <i>Helping Health Workers Learn</i> (Hesperian Foundation).	Cultural tours, multiple workshops and informal interactions with Songhai Centre staff and interns.	Observation of teaching and workshop interaction. Observations of daily interactions with Songhai interns and staff.	Mean = 4.93 Median and mode = 5
Demonstrate cultural competency in working with indigenous populations.	Read sections on Beninese culture and history in Benin travel guide.	Water filter manufacturing workshop and tours with Songhai Centre staff and interns.	Study guide Teaching projects	Mean = 4.87 Median and mode = 5
Articulate an understanding of principles and appropriate technologies for water and sanitation.	Read “Biology in Water” from <i>Water and Wastewater Technology</i> by Hammer. Read “Water Supply and Sanitation” from <i>Field Guide to Appropriate Technology</i> by Hazel & Bull.			

Assess and evaluate water quality.	Complete study guides. Learn water quality analysis techniques in campus laboratory during orientation.	Conduct water analysis in the Songhai Centre laboratory with staff and interns.	Conduct and teach water analysis techniques.	Mean = 4.47 Median and mode = 5
Apply principles of epidemiology to the design of an evaluation plan for a water and sanitation project.	Read epidemiology modules developed by faculty. Complete epidemiology study guides.	Conduct healthy surveys with Songhai Centre staff and interns. Analyze data and discuss results. Evening discussion sessions.	Study guide.	Mean = 4.40 Median and mode = 5.
Articulate social justice issues associated with health and health interventions in emerging nations.	Read “Emerging Water Issues” from <i>Principles of Water</i> by Cech. Read “Linking Poverty Reduction and Water Management” (UNDP report) Complete study guides.	Evening discussions.	Journals Participation in evening discussion sessions.	Mean = 4.67 Median and mode = 5
Prepare and implement health and engineering content for Benin junior high and high school students in English.	Readings on principles of health education and health risk messages. Development of lesson	Provide health education and first aid training to Songhai Centre staff and interns.	Lesson plans. Health teaching sessions.	Mean = 4.93 Median and mode = 5

	plan.			
Articulate basic principles of second language acquisition as they apply to Benin educational contexts.	Readings on language acquisition.	Formal and informal discussions with Songhai Centre staff and interns. Evening discussions.	Journals	Mean = 4.60 Median and mode = 5