

# Designing a New Course with a Spring Break Study Abroad Research Experience Benefits STEM Commuter Students

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## Abstract

To increase our students' access to study abroad opportunities, a full semester course was designed that embedded a study abroad trip to Belize during spring break. The course fulfills both an upper level science course for both biology and biotechnology majors and an elective course for the Global Studies minor. Ten students enrolled in the course, and students' financial aid packages covered all or partial cost of the trip for seven students. The students were divided into four groups to study the coral reef, mangrove forest, and either the rain forest of Belmopan or Punta Gorda. Guest speakers came to class prior to the trip and provided information on the flora, fauna, and marine ecosystems of Central America. In Belize, students completed a research experience, learned about Mayan and Garifuna culture, and traveled extensively within the country. In addition to learning about the ecosystems and culture of Belize, many stated they learned more about themselves and felt more prepared to step out of their comfort zones to travel internationally again. After this positive learning experience all students agreed that they would recommend the course to a friend. The students wrote blogs and presented their research findings in poster and video format at the Undergraduate Research Conference (URC).

**Key words:** short-term study abroad, commuter students, research-experience, full semester course, pedagogy

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## Introduction

Study abroad experiences have long been defined as an example of a high-impact educational practice (Kuh & Schneider, 2008; Ruth et al., 2019). The overall goal of the experience is to make students more globalized citizens and increase their intercultural knowledge (Hser 2005; Lewis & Niesebaum, 2005; Czerwionka et al., 2015). Additional benefits of participating in study abroad include personal growth and increase in employability (Trower & Lehman, 2017). Incorporating a research experience into short-term study abroad provides students access to research that may not be available to them on their college campus (Ruth et al., 2019). The number of American students pursuing study abroad opportunities continues to grow, from 262,416 students traveling in 2007-2008, to 341,751 students in 2017-2018 (The Institute of International Education, 2019, Redden, 2018). The largest group of study abroad students are students majoring in STEM fields, which have steadily increased from 17.6% in 2007-2008 to 25.6% in 2017-18 (The Institute of International Education, 2019). In the 2017-2018 school year, 38.5 percent of all students who studied abroad enrolled in summer study abroad courses (The Institute of International

Education, 2019). Many students choose to do this because the experience does not conflict with required courses traditionally offered only during fall or spring semesters.

However, the summer study abroad model is not as popular with our students as it is for those at other institutions because our students are working full time in the summer. Most of the students at our college are commuters and live at home with their parents. In our BA of Biological Sciences and BS of Biotechnology programs, 38% of students are "first generation" and 8% of students are veterans. In addition to full time course work, most also work part time jobs during the academic year. When asked many of our students are unaware of the study abroad opportunities available to them, or believe they are unable to afford such programs.

The goal of the creation of this new science course was to increase access to study abroad experiences for our commuter students. Short term study abroad offerings of less than two weeks have been growing in popularity in recent years from 8.3 % of overall students studying abroad in 2010-2011 to 12% in 2016-2017 (The Institute of International Education, 2019). The advantage of short-term study abroad is students do not miss class, there is no

negative impact on academic progress to degree and it is more affordable (Smith & Mitry, 2008). Our new full semester course, BSCI 620 Global Science Explorations, embeds study abroad into the spring break week, allowing students to travel to Belize and complete a field research experience on tropical ecosystems of Central America. The study abroad fee was created as a course fee which can be included into students' financial aid packages. In 2017 this was the only study abroad course offered by our college (there was one course added in 2018). The overall goal of creating this course is to provide science majors the opportunity to travel outside of the US, experience new cultures, complete a field research experience and reflect on their learning.

## **Methods**

### **Course design**

The new course (BSCI 620) fulfills an upper-level biological science concentration course for our BA in Biological Sciences major and an advanced biology course for our BS in Biotechnology major. It is also an elective course for the Global Studies minor. The only prerequisite is one year of biology, Principles of Biology I and Principle of Biology II. All enrolled students are required to participate in the spring break trip to Belize, and the study abroad fee can potentially be covered in their financial aid packages. The course was presented and approved by the college and university curriculum committees.

### **Learning Objectives**

#### **Students will:**

Perform background research and design a research experience to investigate internationally  
Investigate, collect and analyze information on their research experience studied internationally  
Experience different cultures of people and investigate their relationships with their native flora and fauna.

Design, create, illustrate and present the results of their research experience and personal experience in different formats

The learning objectives were designed so that they could be fulfilled in future offerings of the course that would travel to different countries not just the initial destination of Belize.

**Choosing a Tour Company and Study Abroad Site**  
There are many companies that offer short term study abroad trips. The three main factors that were used to choose a company were location, itinerary

and cost. Central America was the region chosen because the short flight would ensure maximum time in the country for the one-week spring break. Belize was chosen because the tour company's itinerary (Appendix I), was more academic in nature than the other options and the high value of the US dollar would make it more affordable for the students. Once the contract with the university was signed, the faculty director made direct contact with the on-site guide via email and shared the course syllabus. Together, they modified the trip to meet the learning objectives of the course. In order to make the course more affordable, the students were booked into bedrooms of two to four students.

### **Student Recruitment**

At the beginning of the fall semester fliers announcing an information session were put up around campus, a slide was placed on the kiosks in the student commons and science faculty announced the session details in their classes. Twenty students attended the session. The Faculty Coordinator, the Financial Aid Director, the Study Abroad Coordinator, and the Department Chair attended the meeting to answer questions. It was important to give the students one price that included airfare, room, meals, and onsite transportation so that they could determine the affordability before registering for the course. Students were also told to bring tip money on the trip for the bus driver and guide, as well as a small amount of spending money. The Financial Aid Director encouraged all students to make individual appointments with her so that each student's financial situation could be examined. Both hepatitis A and typhoid vaccines were recommended but not required as per the Centers for Disease Control and Prevention website (CDC.gov). Students were told to make an appointment with the travel clinic far in advance to ensure they would be able to obtain the vaccines. All students who did not have passports were told to apply for one by January 1 to ensure they would be able to obtain one prior to travel.

### **Research Experience Designed**

This assignment was designed to be an introduction to field research as time was limited and each group was provided only one day at their designated site in Belize. The term research experience was used in the place of research project. After direct consultation with the on-site tour guide prior to the trip, four research sites were chosen: two rain forest sites, the red mangrove forest, and the coral reef. The students were asked to pick their first

and second choice of research interest and were accordingly placed into groups of two and three students based on their answers. Each of the four groups performed preliminary research to gain background knowledge and to design a research question to investigate while on site. It was stressed that they should prepare a backup research question, as field research can be unpredictable.

### **International Travel Registry and Insurance**

All participants registered their complete itinerary with the university travel registry. Students registered for the co-requisite course INCO 589 Study Abroad Experience-Short which has a small fee that pays for the student's enrollment in the University travel registry and provides each student with trip insurance. This course is not credit bearing. The travel insurance provided by the tour company was waived.

### **Guest Speakers Enhanced Trip Preparation**

#### **1. Trip to NH Audubon Society**

The class went to NH Audubon Society and met with an ornithologist who trained them to use binoculars and to use specific birdwatching techniques.

#### **2. Wildlife Tour Guide**

The guide came to class and presented information on his experiences traveling to Central and South America. He taught the students how to hike in the jungle, birdwatch, observe wildlife, and experience new cultures.

#### **3. Physician Assistant (PA), Alumna**

Our alumna completed one of her PA rotations in Belize. She provided insight into living in Belize. She talked about the culture, the food, the weather, and her experience working in their healthcare system.

#### **4. Infection Preventionist Nurse, Alumna**

Our alumna provided information on precautions that needed to be taken when traveling abroad. Specific precautions of food borne illness and insect borne diseases were highlighted.

#### **5. Postdoctoral Research Fellow**

Our Postdoctoral Research Fellow focused very specifically on her current research on the Mangrove Forests and Marine Ecosystem of Central America.

### **Class Assignments Prior to Trip**

Students participated in the annual NH Audubon Backyard Bird Count (<https://www.nh Audubon.org/backyard-winter-bird-survey/>) and submitted their results to Audubon and

their course instructor. Each week, they wrote reflections on what they learned from each guest speaker. They also created a bibliography of articles on their research area prior to their trip.

### **Spring Break Trip**

While in Belize, four research experiences were completed: The cohune palm as a keystone species, Mayan jungle survival skills, the importance of mangroves on the marine ecosystem and the mutualistic relationship between marine life and the coral reef. All students wrote field notes and recorded birds sighted daily at every research site in their Rite in the Rain All-Weather Journals. They visited Mayan ruins, a Mayan chocolate factory, had a Garifuna drum lesson and concert, and hiked in the jungle (daytime and nighttime).

### **Post Trip Assignments**

Class time after spring break was spent designing and creating their research presentations. Each student group presented a poster on their research experience at the Undergraduate Research Conference (URC). Each group also created a five-minute narrated Point of View (POV) Video of their personal experience and participated in the video competition at the URC Cinema Arts Day. The individual blog assignment was limited to 600 words and the prompt was Describe the experience from your point-of-view to put readers in your shoes. Be creative and feel free to use your voice. The blogs were posted on the college website and the UNH Center for International Engagement and Global Studies website.

Students were surveyed prior to and after their trip to Belize. This project was approved by the University of New Hampshire Board of Institutional Review, and informed consent was obtained from all participants (UNH-IRB #: 6623).

### **Results**

#### **Demographics and Pre-trip Expectations**

Ten students enrolled in the first time-offering of the course: eight seniors, one junior and one sophomore. The demographics of the course were diverse in age with one student < 21, six students 21-22, two students > 23 and one > 30 (Table 1). Four of the students were designated as First Generation and one Veteran. Most of the students (6) were white, with one White-Native American, one Hispanic and one Asian (Table 2). Of the ten students, four had never traveled outside the U.S. before, and obtained their first passports prior to the trip. The remaining

students had traveled abroad with family. For four students, the cost of the trip was covered by their financial aid package, and three additional students received partial coverage for the trip through their financial aid package. This paper focuses on the creation and first offering of the course. Due to the initial success the course was offered again in 2019 and eight students traveled to Belize; the 2020 course was headed for Iceland when their trip was cancelled 48 hours in advance of their departure due to the COVID-19 global pandemic (Table 1, Table 2).

In the pretest survey (Appendix II) prior to the trip, students stated their overall expectations were to learn more about Mayan culture (7/10 students, 70%); to have new experiences (5/10, 50%) (such as snorkeling, night hiking); and to learn more about the diverse flora and fauna of Belize (10/10, 100%). There was some trepidation about getting out of their comfort zone, as one student stated “I plan on gaining new perspectives on what life is like outside of our cushy American lifestyle. The thought of being in such a different place is kind of intimidating but I am

looking forward to fully immersing myself in that culture and environment.”

**Undergraduate Research Conference (URC) Presentations**

Each student research group presented their research in poster format at the URC: Red Mangroves of Placencia Belize, Coral Reef of Placencia Belize, Our UnBelizeable Survival Experience: Punta Gorda, Belize, and The Broadleaf Forest of Belmopan Belize and they answered a variety of questions during the session. At the URC Cinema Arts Day each group introduced the POV videos they created and after the screening answered questions from the audience. This assignment focused on their personal experience in Belize and showed the places they visited, the people they met, the flora and fauna they examined, and the food they ate. The videos were narrated by the student creators and provided insight on the positive impact of their experiences. Both the posters and videos were met with a lot of interest from the respective audiences.

**Table 1**

*Student demographics 2017-2020*

Year	#	Woman	Man	Other	Age				Veteran	First Gen
					<21	21-22	23-30	>30		
2017	10	8	2	0	1	6	2	1	1	4
2019	8	6	2	0	0	2	4	2	1	3
2020	10	9	1	0	3	4	2	1	0	6

**Table 2**

*Student demographics 2017-2020*

Year	White	Asian	Black	White, Native American	Hispanic	Unknown
2017	6	1	0	1	2	
2019	5	1	0	0	1	1
2020	9	0	1	0	0	

## Student Blogs

The blogs were analyzed using thematic analysis (Vaughn & Turner, 2016) and seven common themes emerged. Theme 1: Nervous to Travel Abroad. Two students (2/10, 20%) indicated they were nervous about traveling abroad. One of these had never traveled outside the US. Theme 2: Excitement to Travel Abroad. A few students (3/20, 30%) were very excited and this theme is best illustrated by the following quote "Hearing their [guest speakers] stories made me crave the moment when we finally got to leave home and travel to Belize". Theme 3: Meeting the Belizean People. Most of the students (7/10, 70%) mentioned how kind and polite the Belizeans were "I loved how cordial and respectful Belizeans are, I was welcomed everywhere we went". Theme 4: Culture. All the students (10/10, 100%) mentioned the Mayan and Garifuna culture and their appreciation for the knowledge gained through their direct experiences about the cultures through music, food, visiting historical sites and guided activities. Theme 5: Research Experience. All students (10/10, 100%) mentioned their research experience in their blogs. "I was most excited about snorkeling in the mangroves, which was my environment of study. It was unlike anything I had ever seen. Like a different planet just below the water line". Theme 6: Advice to Future Students. Almost all the students (9/10, 90%) made advisory statements for future students to take this class. "You will learn more than you ever intended to, especially with a class. It's one thing to learn lessons in class, but to live what you are learning and to make memories is far greater than any words on a page". Theme 7: Value added. Most of the students (9/10, 90%) ended their blogs with statements about their positive experience. "Traveling changes your perspective of the world, makes you appreciate not only your life but others more as well, and helps you see why trying to preserve and protect the earth is so important". The blogs were posted on the college website and on the University's Global Education website. The blogs demonstrated that this short trip to Belize had a high impact on the students and they met the learning objectives of the course.

Students were surveyed (Appendix II) after they returned from spring break and reported that all would recommend the course and travel abroad again (Table 3). When asked to reflect on their experience and state what they learned about themselves, it appears they were initially nervous but became more confident trying new things (Table 4).

All students stated that this opportunity enhanced their undergraduate experience by gaining a different perspective of the world, acknowledging the extravagance of life in the US and making new friends (Table 5). For most of the students (9/10, 90%), this was their first and only research experience of their undergraduate career. Students stated that their research experience met (6/10, 60%) or exceeded their expectations (4/10, 40%) (Table 6). Overall, the course fulfilled the goals of the faculty creator, as the group learned a lot about themselves, their research experience site, the country of Belize, and its people.

## Conclusion and Next Steps

This course successfully filled a need to provide the opportunity for science majors to study abroad without interfering with their curricular plan or spring semester courses. The goal of creating a course to increase access to study abroad experiences for our commuter students was achieved and due to its initial success, it has been offered two more times (Table 1, 2). For all but one student this was their first research experience. Skills gained by students were taking field notes, bird identification and observing marine life while snorkeling. From the faculty perspective, obtaining approval for the new course started one year prior to the recruitment of students. Traveling with the students and seeing their joy and excitement each day was a very rewarding experience.

The next goal is to encourage more faculty at our college to use this model to take students abroad for spring break. For students who have never traveled abroad a one-week experience is less daunting than a full semester or summer study abroad experience. Traveling to Central America is also more cost effective than to Europe where many study abroad experiences are set. By making the study abroad fee a course fee allows students to potentially have the trip covered by their financial aid package. When creating a similar course make sure to include meals, flights, tips and transportation all in one price. This strategy eliminates any frustration from the students as no additional costs are incurred during their trip. As we were in the jungle most of the trip students needed very little spending money.

While during the COVID-19 global pandemic study abroad programs have been cancelled or postponed it is important to note it takes an estimate of 1-1.5 years to find a study abroad vendor, create a new course, obtain approval from the college curriculum committee and study abroad office. So, by starting to plan now will enable your students to study abroad when the world is open to them.

**Table 3**

*Posttest data that demonstrates students are likely to study abroad again*

Question 13: Has this experience increased or decreased the likelihood you will travel abroad again? Explain.
"Increased, I barely left New England my whole life and never been outside of the Northeast. It opened my eyes to a whole new world."
"Increased. I can still feel the joy that the beauty and culture of Belize gave me. I fell in love with the country. I crave more experiences traveling abroad." (Note: she traveled to Thailand for vacation by herself after graduation)
"Increased. I have always loved traveling, and this just added to my curiosity of other cultures." (Note: this premed student spent her gap year living in Thailand teaching elementary students English)
"This experience has made me catch the travel abroad bug! We've only been home for a week and I already want to go back to Belize!"
"It has definitely increased the likelihood of traveling abroad again. I've always wanted to travel, but never had the chance to. This trip has really opened my eyes about the importance of traveling and learning about the world around me."
"I will definitely study abroad again. Why not! Do it now while you are able. So happy I did this experience. It was a lot of fun and the sights were breathtaking".
"It increased it! Going abroad was amazing (to the point that I didn't want to come back that soon). I'm looking forward to going abroad again sometime soon".
"I mean I always love traveling so I guess increase. Its amazing to see different lifestyles. Never confine yourself to one way of thinking expand your mind, grow, do, learn that's what life is all about".
"I would without a doubt travel abroad again".
"Increased my likelihood because the more I do it, the more comfortable I am. I also enjoy the learning, the diversity, the uniqueness, and the collection of passport stamps".

**Table 4**

*Posttest data students learn more about themselves after this study abroad experience*

Question 8: Through this study abroad experience what did you learn about yourself?
"I learned that I am more willing to try new things that I am not familiar with. I ate a termite, went on a night hike and explored a cave; all examples of actions I typically would not think to do in New Hampshire."
"I learned how easy it was to make friends, once I let my guard down."
"I learned that I am very adventurous and love nature. I also found that I love the different cultural foods that can't be found around here."
"From this study abroad experience, I learned I need to start pushing outside of my comfort zone more. I would usually never take a class like this let alone go to a foreign country with a class of people I hardly knew! I am so glad that I finally got the courage to go and do it and now nothing is going to get in my way of taking amazing experiences like this again!"
"I learned to take risks. I also am more appreciative of what I have before me. The Mayans have very little and yet they seem pretty happy."
"I enjoy learning about the way of living of different cultures and how their perspective is different from mine."
"I was very nervous heading into the trip, but I found myself becoming less and less every day and eventually every situation we found ourselves in was a blast."
"I learned that I really love learning about culture. It has always interested me but experiencing it in person was surreal. It's amazing to learn about life and how different it was before our time. I also learned that my love for nature only goes to a certain extent. I'm also not entirely sure if I would be able to survive in a jungle".
"I learned that I am always up for an adventure. I will say yes to almost all new experiences that present themselves to me. I also learned to take time to get to know locals to get a more authentic perspective of their lifestyle".
"I learned that bugs don't creep me out as much as I thought they would. I also learned that I was able to adapt pretty quickly to such a different lifestyle. I was very nervous heading into the trip, but I found myself becoming less every day and eventually every situation we found ourselves in was a blast".

**Table 5***Posttest data demonstrates that students' overall undergraduate experience is enhanced*

Question 12: How has this study abroad experience enhanced your overall undergraduate experience?
"Before taking this class I did not have much of a social life on campus. UNH Manchester is a commuter school so I did my work and left. If I hadn't taken this class, I wouldn't have gotten close to these people that I can now call my friends."
"It has made all the difference. Undergrad has been stressful (still is), but this experience really did top off my senior year. Being able to travel with my professors who I consider my mentors and being able to gain knowledge that I couldn't have gotten in the States, has made this an unforgettable year for me."
"This study abroad experience enhanced my overall undergraduate experience by giving me something very unique to it. I don't know many people who get to go abroad to begin with so I think it gives me a competitive edge how well rounded I can be."
"It was my favorite class by far and its enhanced my undergraduate person by giving me a different perspective on the world. We live such extravagant lives while others struggle but still live life to the fullest-unbreakable attitudes-and I think that's so beautiful and makes me feel blessed for the life I live and to try and become a more positive person."
"It gave me another kind of learning rather than just sitting in a classroom. We got to apply what we learned in real life which was something many people don't get."
"I love biology! So, when I was on the trip and saw the acacia tree, wildlife and other plants and ecosystems it truly connected the loose ends that I once have learned in Principles of Biology. This experience was both educational and adventureful."
"This has enhanced my undergraduate experience by giving me a different perspective of the world."
"This study abroad experience was the perfect way to cap off my senior year. It was 8 days of pure adventure that I will never be able to replicate. I will remember this trip forever."
"It took me out of my mundane biology/work lifestyle for a change. I have a greater appreciation for the opportunities I have been provided in life and by my school. Hopefully my future work will show that."
"I think I learned about myself too much and found out that I like to go to places that I never been. This is a great thing for my undergraduate experience because I have a story to tell & even consider taking courses w/options similar to the ones given in this course".

**Table 6***Posttest data students' reflections on their research experience*

Question 4: Did this research experience meet your expectations?
"I learned to go into this experience with an open mind. My experience was better than I expected."
"I think this trip was amazing, but maybe include more research tools and methods."
"It did. I was very pleased & happy with everything that took place in this experience. I think I learned a lot more than I anticipated."
"It exceeded them. I had so much fun & learned so much more than I could have hoped. We had amazing guides who were willing & interested to share knowledge."
"Yes and then some! I thought I'd only get to observe mangroves from shore or on a boat. When I realized I was going to snorkel around a mangrove island, I was ecstatic. Plus, all the cultural and historical information, I learned about Belize was a bonus."
"Yes, this experience met all my expectations! I have not had much experience in doing field work and this opened my eyes to a whole new and exciting world of research."
"Yes, it did. I've never performed research prior to this and for a first time experience it definitely will be hard to top for other research trips."
"The research did meet my expectations as an end result".
"It did, we had to change our entire research project from birds to ways to survive in the jungle, which we didn't mind. We learned a lot about the environment and ourselves that day".
"The research experience met my expectations".

Overall, this new course fulfilled the goals of the faculty creator, the learning objectives of the course and the group learned a lot about themselves, their research experience site, the country of Belize, and its people. The next offering will be spring 2022 with a trip to Costa Rica.

### Acknowledgements

Thank you to the students who participated in this class and to our guide in Belize Efrain Cocum who taught us so much about his beautiful country. A special thanks to Dr. Annie Donahue her helpful comments.

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