

**Investigating barriers to help seeking on Abaco Island, Bahamas: connecting teachers with  
environmental education resources**

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### **Abstract**

This study utilized surveys to investigate whether familiarity with Friends of the Environment (FRIENDS) would affect the likelihood of teachers seeking science curriculum help from FRIENDS. While the results indicated no connection between familiarity and help seeking, distance of the respondent's school from the FRIENDS Center is a barrier to seeking help via visiting the FRIENDS Center. Most respondents prefer electronic means of communication or resource gathering, so FRIENDS should build upon their awareness and outreach through those methods. This could help remove the barrier of distance for those teachers located outside of Central Abaco; bringing resources to them through the internet. It is recommended that FRIENDS continue to place emphasis on multiple types of outreach to reach the widest population of teachers possible. FRIENDS staff and Board members should continue to seek relationships with teachers and make sure that teachers who are new to the island are included in FRIENDS activities. A larger sample size should be sought to increase accuracy of data and build upon what has been learned through this survey.

### **Introduction**

Friends of the Environment (FRIENDS) is non-governmental, non-profit organization based in Great Abaco Island, Bahamas and established in 1988 by a group of community volunteers concerned about the rough treatment of Abaco's environment (Friends of the Environment, 2013). The group of volunteers has grown and the organization now has a full time staff of five and a governing Board of 13. FRIENDS' mission is "to preserve and protect Abaco's marine and terrestrial environments in order to achieve sustainable living for the wildlife and people of Abaco". FRIENDS operates with the guidance of a strategic plan focused in four core areas: habitat conservation, reducing human impacts on the marine environment, reduction of invasive species, and litter prevention. These issues are approached strategically through environmental education (Ham, 1997). Hungerford and Volk (1990) cite these objectives from the 1997 Tbilisi Intergovernmental Conference on Environmental Education as stepping stones for the process of environmental education: awareness of the environment, sensitivity to threats, and changing attitudes and behaviour. Because education is key to the work of FRIENDS

it is critical that the organization form strong relationships with local teachers and be efficient in disseminating information to schools.

This study sought to investigate whether Abaco teachers who are familiar with FRIENDS will be more likely to seek help from FRIENDS than those who are not. It was predicted that teachers who are familiar with FRIENDS will be more inclined to reach out to FRIENDS for help with materials, while those who are unfamiliar will be less inclined to reach out to FRIENDS for help with materials or will seek other sources. The survey was designed to seek information to assist with the following project goals: (1) Investigate the reach of FRIENDS, (2) Identify how teachers learn about FRIENDS, (3) Measure the willingness of Abaco's teachers to seek help outside their academic institution, i.e. from FRIENDS, (4) Investigate factors that could affect seeking help from FRIENDS, (5) Identify the needs of teachers to implement Bahamian science curriculums, (6) Identify appropriate and effective methods for communicating with teachers and dissemination of information, (7) Seek new approaches to engage Abaco's teachers in conservation education, (8) Consider barriers to implementing conservation education in Abaco.

### **Methods**

The target population was primary and secondary science teachers in Abaco, Bahamas; including both those who teach science only (specialists) and those who teach all or multiple subjects (generalists). The approximate total teacher population is 300 (J. Richard, personal communication, September, 2013). According to the Abaco District Education Office there are 10 high school science teachers and 76 primary level generalists in the public school system (personal communication, September 26, 2013). There is no centralized location for acquiring reliable statistics about the private school system in Abaco. The survey was designed in the online tool *Qualtrics* (Provo, UT), which enabled creation of questions in multiple formats and online sharing of the survey. Data was collected through Qualtrics and hard copy surveys delivered to schools (Appendix A). Responses collected on paper surveys were entered into the Qualtrics survey form so that the raw data would be compiled into the Qualtrics spreadsheet along with the other responses already collected online.

Respondents were asked to ensure that they only complete the survey once. A link to the survey was posted on FRIENDS' Facebook page (Facebook, 2013) and shared on the researcher's personal page. An email including a link to the survey was sent to known teachers in FRIENDS' membership database with a request that it be forwarded to other teachers. Hardcopy surveys were distributed to schools visited by FRIENDS' education officer. Data were collected from October 11 to November 1, 2013. The survey included questions which addressed demographics (Questions 1-5), familiarity with FRIENDS (Questions 6, 7, 10, and 15), help seeking (Questions 8, 9, 11 and 13), preferred methods of communication (Questions 12 and 13), and teacher needs (Questions 14 and 16). Sample size varies throughout the results as teachers were not required to answer all survey questions.

### **Demographics**

Respondents were separated into four distinct geographic groups based on location and distance or effort required to visit the FRIENDS Education Center, which is in Central Abaco (Figure 1). Generic questions were asked to determine the respondent's gender, age category and grade level taught (Appendix A).

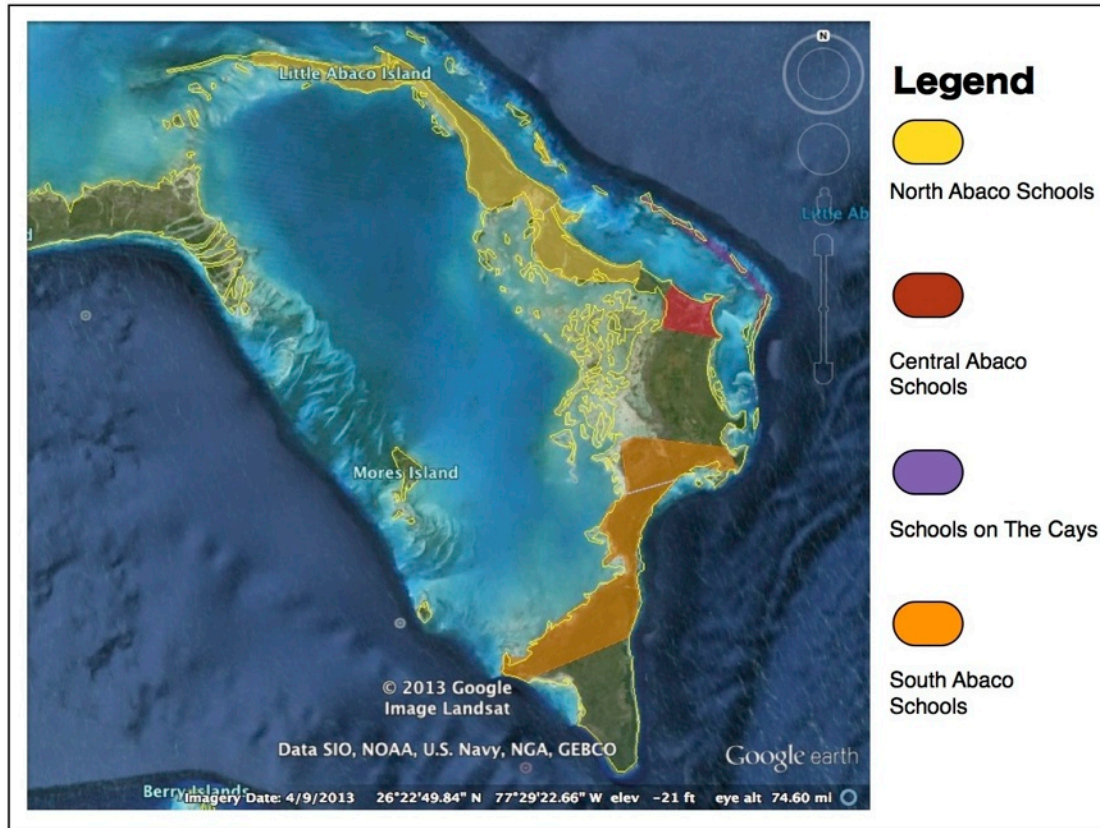


Figure 1. A map showing general locations of schools on Abaco Island. Four categories were used in the survey to identify the geographic area of each respondent: North Abaco (Treasure Cay to Crown Haven and Green Turtle Cay), Central Abaco (Murphy Town, Dundas Town and Marsh Harbour, The Cays (Guana Cay, Man-O-War Cay and Elbow Cay) and South Abaco (Cherokee Sound, Crossing Rocks and Sandy Point). (Google Earth, 2013). Areas without colour designations have no schools.

### **Familiarity**

Basic level of awareness of respondents and the method in which they became familiar with FRIENDS was quantified. Respondents were also surveyed to see how familiar they are with the services provided by FRIENDS in terms of in-class presentations, field trips, and the resource library (books, DVD's, lesson materials). They were also given the opportunity to answer in the negative if they were not aware of any of these options (Appendix A, Question 11). Two responses had to be removed from the results because they selected various resource answers as

well as “I didn’t know about any of these options”. Responses to Question 11 were summed up to determine which service respondents were most aware of.

### **Help Seeking**

Respondents were asked to select the frequency at which they seek help from others or from reference material by rating on a 5-point Likert-type scale from “never” to “very often”. Answers were grouped to show how often each resource was used by displaying the results in a stacked graph (Figure 5). The results for questions 9 and 10 were simply quantified.

### **Communication**

Respondents were provided with six methods of communication and asked to rate them in order of most- to least-likely to respond to (rating of 1 to 6). Based on methods suggested by The University of Reading Statistical Sciences Center (2001) each rating was assigned a score. Top rated modes of communication were assigned higher scores, e.g. a ranking of 1 would equal a score of 6, a ranking of 2 would equal a score of 5 and so on. Scores were summed and measures of central tendency were calculated.

### **Teacher Needs**

Questions 14 and 15 provided an open response opportunity for teachers to suggest services and resources that FRIENDS could provide to assist them. Any identifying information that the respondents put in their answers was removed before inclusion in the report.

Questions 8, 9, 10 and 13 returned Likert-type data (Boone Jr. and Boone, 2012) so they were analyzed using mode and median as measures of central tendency. Each text answer (e.g. Highly Unlikely) was assigned a number value relative to the answer scale (Qualtrics, 2013); values were used in the analysis, then converted back to text for purposes of discussion. The Fisher’s Exact Test was chosen to compare groups of data in this study because the data were nominal, independent and there was a small sample size. An online tool for the Exact Test provided by College of St. Benedict and St. John’s University (2013) was used in this analysis.

## Results

### Demographics

Of 28 respondents, 23 were female and 5 were male. Five people indicated that they teach in North Abaco, nineteen teach in Central Abaco, two teach in The Cays and two teach in South Abaco (see Figure 1). Respondents fell into age categories between 26-35 and 66 and over. The most frequent age category selected was 46-55, which represents 42.9% of the respondents (n=28, Appendix C).

In question 4 (Appendix A) respondents were asked the total number of years they had been teaching and the number of years teaching in Abaco. Five respondents incorrectly answered this question, either providing answers where the total number of years teaching was less than the number of years teaching in Abaco, or the number of years teaching was greater than the age category they selected for themselves. Those responses were not included in analysis for that question. Average career length for teachers answering this survey was 19.3 years, with an average of 7.9 years spent teaching in Abaco (n=23); the median number of years spent teaching in Abaco was 6. Two of the teachers appear to have started their careers in Abaco.

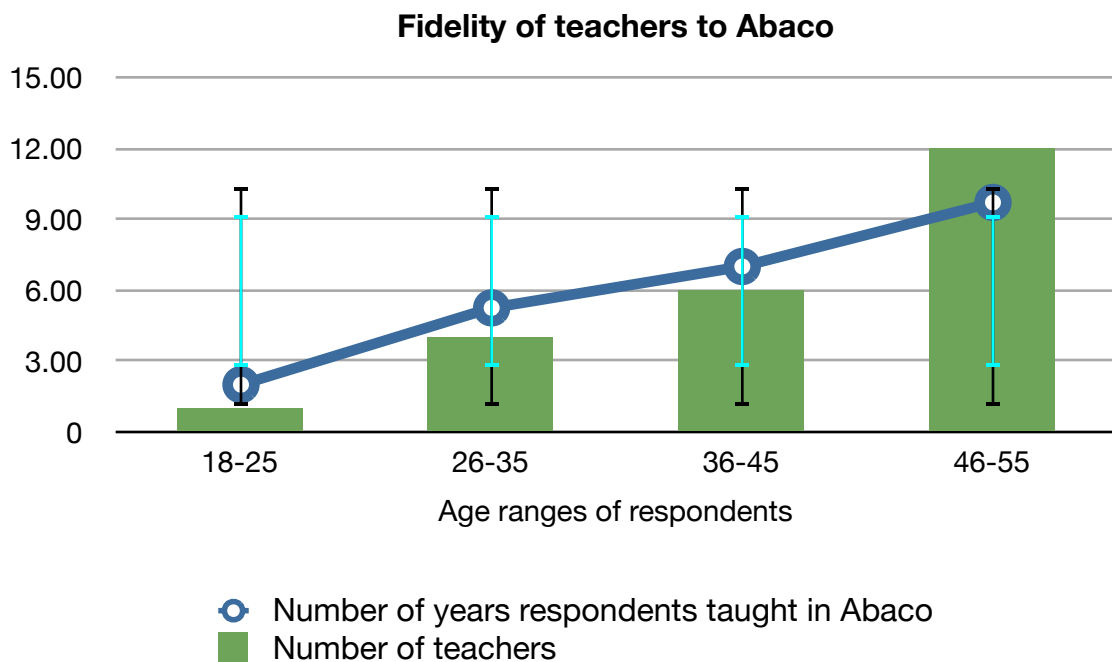


Figure 2. A graph showing the relationship between the average age of teachers responding to the survey and the average number of years spent teaching in Abaco. Black error bars correspond to

the number of teachers responding and electric blue error bars correspond to the number of years spent teaching in Abaco.

Five respondents reported teaching at primary and secondary levels of both public and private schools. It is uncertain whether this is in error. It is possible that the teachers are involved in after-school tutoring or some other situation which places them at both private and public schools. Most teachers answering the survey cover more than one grade level category. Because one of the survey goals is to investigate reach the number of instances where each grade level category was represented by the survey respondents was summarized. All grade levels were represented and there was a fairly even split between public and private schools (Figure 3).

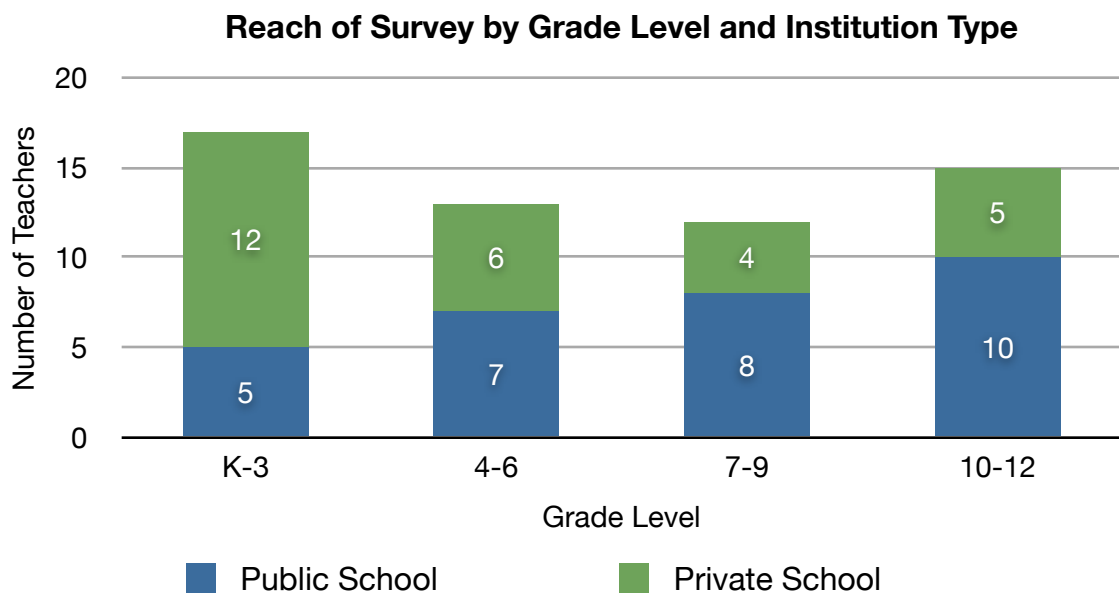


Figure 3. Grade levels taught by survey respondents. The numbers on the bars represent the number of respondents from each institution type (n=28).

### **Familiarity**

96.4% of respondents (n=28) claim to have been familiar with FRIENDS prior to the survey. The one person who said they were not familiar with FRIENDS also said that they heard about the organization from television, so it is possible that the respondent meant to answer “Yes”. Also, one of the respondents who said they were familiar with FRIENDS did not give a



descriptive answer to the question “how did you find out about FRIENDS?”; they selected “not applicable” instead. The most successful methods of raising awareness of FRIENDS (Figure 4) appear to be school programs and word of mouth.

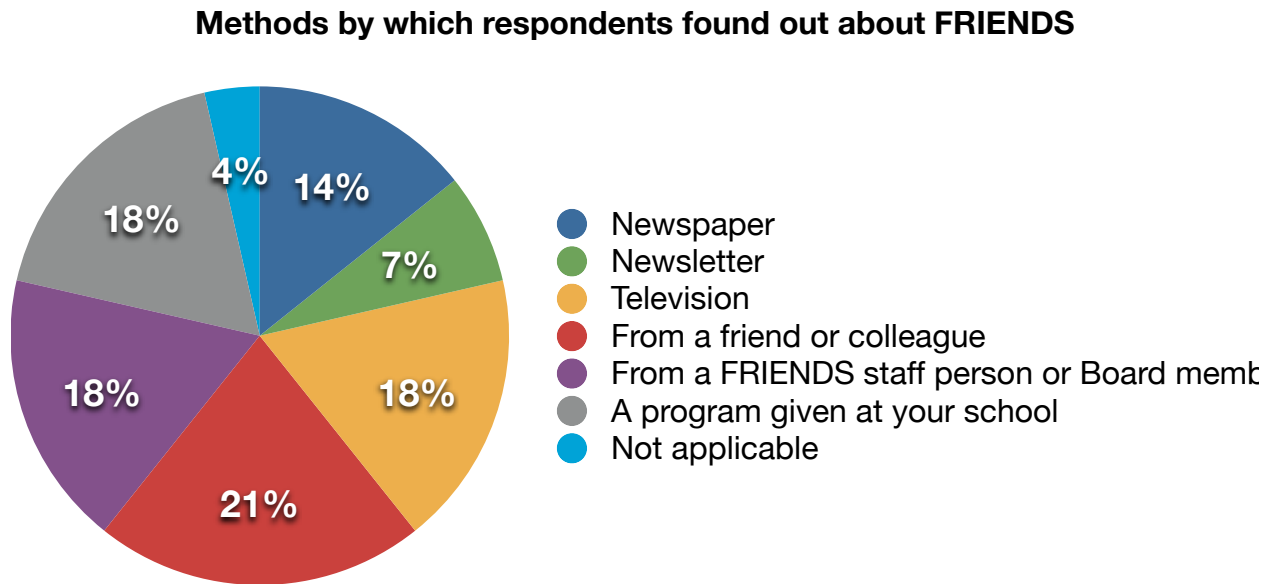


Figure 4. Various methods by which teachers who were familiar with FRIENDS prior to the survey found out about the organization. (n=28)

Sixteen respondents were aware that FRIENDS offered in-class presentations, 11 were aware of the resource library, 20 were aware of FRIENDS’ assistance with field trips and five respondents were not aware of any of the offerings.

### Help Seeking

Internet and text books were the most popular references used by respondents (Figure 5). Friends of the Environment, Administrators and the Library were used least often when seeking help for resources and materials needed to implement the science curriculum.

**A Likert-type representation of the frequency at which Abaco teachers seek help from various resources**

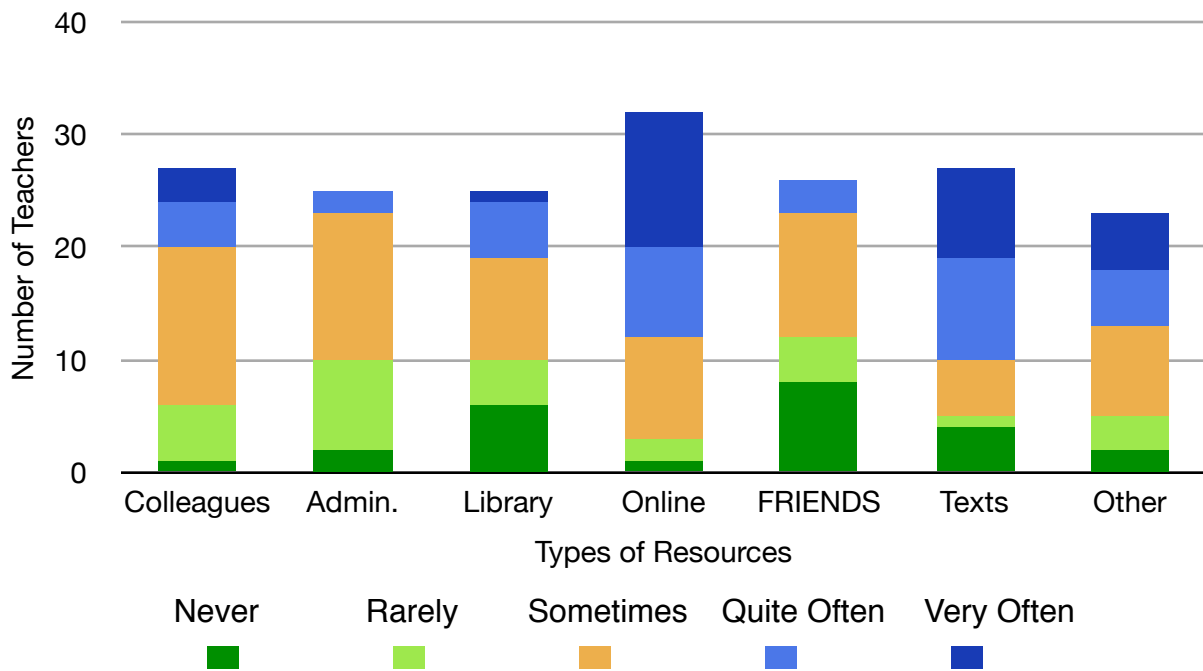


Figure 5. The frequency at which respondents seek help from various typical resources (Colleagues, Administrators, Library, Online, Friends of the Environment, Text Books, Other Sources).

When asked “if you needed help with materials for science-related lessons would you ask Friends of the Environment for help?” most respondents answered in the positive, only 11% of people selected either “No” or “Not Likely” (n=27). Out of 28 respondents, most report having a fairly easy time accessing resources needed to teach science (Easy - 28.6%; Very Easy - 14.3%). 32.1% of respondents have a challenge getting access to resources (either “Very Difficult” or “Difficult”) and 25% were “neutral”.

Because nearly all respondents indicated that they were familiar with FRIENDS prior to seeing the survey, an index of familiarity was created by counting the number of FRIENDS resources that each respondent was aware of; either 0, 1, 2, or 3 (Appendix A, Question 10). A Fisher’s Exact Test was done to investigate whether there was a relationship between “familiarity index” and “likelihood to ask FRIENDS for help” (Appendix A, Question 11). The result was  $p=0.886$  ( $df=12$ ,  $n=25$ ), so the test failed to reject the null hypothesis: there is no association

between familiarity index and likelihood to ask FRIENDS for help in this sampling of respondents.

To investigate the effect of distance on seeking help from FRIENDS scores were given to each geographical area (Figure 1) in relation to the distance and difficulty in accessing the FRIENDS Center (1-4, with 1 being the easiest commute and 4 being the most difficult or time consuming/costly). This was compared with the “likelihood to ask FRIENDS for help” (Appendix A, Question 11) using Fisher’s Exact Test;  $p=0.794$  ( $n=27$ ), indicating no association between the two factors. In comparing the geographical area with the likelihood of respondents to visit FRIENDS’ Education Center,  $p=0.010$  ( $df=12$ ,  $n=26$ ), this low p-value indicates that there is some correlation between geographic area and likelihood of respondents to visit the FRIENDS Center. The majority of positive responses came from teachers in Geographic Area 1, Central Abaco, where the FRIENDS Center is also located (Figure 1).

### **Communication**

Using the mode as an measure of central tendency, most respondents indicated that they would be *very likely* to seek resource materials from FRIENDS via the website, and were *likely* to utilize the FRIENDS hardcopy newsletter for Educators, a phone call or a visit to the FRIENDS Center as ways of seeking resource materials. The majority of respondents (32%,  $n=25$ ) were *neutral* regarding the FRIENDS E-newsletter. Respondents indicated that they would be most likely to respond to an email, phone call or personal visit from FRIENDS, in that order.

### **Teacher Needs**

Twelve teachers chose to give comments on additional resources that FRIENDS could provide in order to assist them with science lessons (Appendix A, Question 14; see Appendix B for all responses). The responses included feedback such as:

An itemized list of materials or topics covered. (Book list, curriculum guides, field trip ideas list, posters and videos list). A better idea as to what materials are available and the expertise in different scientific areas; Materials to help with science experiments.

Respondents were given additional space to leave questions, comments and more information on resources that they need (Appendix D). Seven teachers chose to leave comments which included invitations/requests to host field trips and presentations, recommendations that FRIENDS make themselves more visible in the community, a need for curriculum on local medicinal plants, and a request for science equipment such as metric or balance scales that the school needs, but would use infrequently, thus they can't prioritize purchase of them.

### **Discussion**

The focus of this study was to investigate whether teachers who are familiar with FRIENDS would be more inclined to seek curriculum help from FRIENDS than those who are not. However, all iterations of data analysis looking at familiarity versus help seeking returned non-significant results. It is possible that the small sample size affected the results and it is recommended that more data collection be undertaken to further inform the study. Despite this, the data did reveal some interesting information.

The average length of time spent in Abaco by teachers increased linearly with age of respondents, suggesting a pattern that teachers who move to Abaco tend to stay. There is some error involved because of the small sample size, but the pattern has been observed anecdotally by the researcher. This could mean that any information shared by FRIENDS with teachers who are new to Abaco has a good chance of becoming institutional knowledge.

Respondents found out about FRIENDS through a wide variety of ways. While there was a fairly even split between methods, those that involved personal interaction were cited slightly more frequently. It is recommended that FRIENDS continue to seek multiple avenues to promote the organization to teachers, with a focus on personal conversations or visits. Additionally, Board members should be reminded of the value of word of mouth and their role in promoting the organization.

The teachers' location did not impact the likelihood of asking for help, however it did affect the likelihood that the respondent would visit the FRIENDS Center. Accessibility is a key factor in help seeking (Rijt *et. al.*, 2013). Teachers who do not visit the FRIENDS Center are less

likely to take advantage of the in-house resource library, so FRIENDS should seek ways to make that information more accessible; on the website, for example.

Electronic means of communication and resource seeking were most preferred, as appropriate to today's technology. Kitsantas and Chow (2007) found that college students in both traditional and web-based classes preferred seeking help from their teachers and peers via email and that they felt more confident doing so electronically than in person. By providing more resources on the website and making teachers aware of their availability FRIENDS will be able to provide some autonomy to the teachers so that they can seek references whenever they choose and in private so that they do not need to face criticism (Kitsantas & Chow, 2007). Ages 56 and over were not well represented in the data; it is possible that older generations are not using email or the internet as frequently as the younger age groups.

Teachers who answered the open response questions indicated that they would like more information about services and materials offered by FRIENDS as well as the expertise of FRIENDS staff in order to know what they are capable of offering. If teachers believe that FRIENDS can fill a gap in their knowledge or resources and they perceive FRIENDS as available to them they may be more likely to consult the organization (Butler, 2007; Rijt *et.al.* 2013). This presents a challenge in improving how FRIENDS communicates with teachers; a better job of promoting available resources can be done through the website and emails to teachers, and more outreach could take place to raise awareness of staff expertise by sharing staff profiles in those communiques. FRIENDS is able to take advantage of lessons learned through this survey and use them to adjust strategic programs as needed, which is an inherent benefit of NGO's and other private institutions (Palmer and Birch, 2003). However, in order to properly serve public school teachers, FRIENDS has to provide materials which complement the curriculums set forth by The Bahamas' Ministry of Education; thereby providing knowledge that is useful to teachers (Rijt *et. al.*, 2013). This somewhat restricts and shapes the resources FRIENDS is able to provide to schools, however, FRIENDS is able to extend its reach to a wider audience through schools, after-school activities and community outreach (Palmer and Birch, 2003).

### **Action and Reflection**

I was very pleased with my IAP concept because I knew it could be useful to FRIENDS, which falls in line with my master plan. I was grateful to classmates in my Baja discussion group for helping me to brainstorm ideas. I wish I had finalized my question and methods a bit earlier to take advantage of more opportunities to distribute the survey through visits that FRIENDS' education officer made to schools at the start of the school year. Some schools were missed because of the time, effort and cost required to reach schools on a 120 mile long island. If I were to repeat the survey I would reorder the questions to fit the categories I identified in my methods (i.e. Demographics, Familiarity, Help Seeking, etc.). I would also try to standardize the Likert-type response options for my questions. I really valued the answers to the open response questions and I wish that more teachers would have responded to them. Their feedback is going to help shape some of the action steps resulting from this IAP.

My first step for improving the FRIENDS education program will be to develop a centralized resources page for the FRIENDS website which will include a list of downloadable presentations, lesson plans and activities that we currently provide. Staff profiles are already posted on the website, but that information can be shared in our monthly e-newsletter or newsletter for teachers. I would also like to include tips for teachers in each edition of the e-newsletter. FRIENDS is hosting an island-wide science fair on November 22nd, 2013; I can take that opportunity to have a booth displaying resources available for teachers. FRIENDS is also hosting a science conference January 17th and 18th, 2014. All schools are invited to attend, however, special focus can be placed on connecting teachers with researchers. I will also discuss with staff and Board the possibility of having a stock of science equipment that schools can rent or loan. There is an opportunity to provide teacher training during pre-scheduled government workshops. I will connect with the Ministry of the Environment to discuss partnering on this. We could analyze the effectiveness of the workshops as was done in Ham *et. al.*(1988).

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## Appendix A - Survey

"The purpose of this research is to assess awareness of Abaco's teachers about Friends of the Environment, teacher needs for science lessons, and willingness to seek help regarding science-based lessons and is being conducted as part of Olivia Patterson's work in a Master's program at Miami University. The survey should take about 5-10 minutes to complete and you may stop at any time. Confidentiality and anonymity of responses will be maintained to the highest degree possible. If you have any questions you can contact Olivia Patterson at [Olivia@friendsoftheenvironment.org](mailto:Olivia@friendsoftheenvironment.org). If you have questions or concerns about the rights of research subjects, you may contact the Research Compliance Office at Miami University at (513) 529-3600 or [humansubjects@miamioh.edu](mailto:humansubjects@miamioh.edu)." If you have already filled out this survey online, thank you for your time! Please only fill out the survey once.

1. What is your gender?

- Male  
 Female

2. Select the option(s) that best describes your current employment (check all that apply):

- |   |  |
|---|--|
| <input type="checkbox"/> Public School - Grades K-3   | <input type="checkbox"/> Private School - Grades K-3   |
| <input type="checkbox"/> Public School - Grades 4-6   | <input type="checkbox"/> Private School - Grades 4-6   |
| <input type="checkbox"/> Public School - Grades 7-9   | <input type="checkbox"/> Private School - Grades 7-9   |
| <input type="checkbox"/> Public School - Grades 10-12 | <input type="checkbox"/> Private School - Grades 10-12 |

3. Please select your age bracket.

- |                                |                                      |
|--------------------------------|--------------------------------------|
| <input type="checkbox"/> 18-25 | <input type="checkbox"/> 46-55       |
| <input type="checkbox"/> 26-35 | <input type="checkbox"/> 56-65       |
| <input type="checkbox"/> 36-45 | <input type="checkbox"/> 66 and over |

4. How long have you been teaching?

How many years have you taught in total? \_\_\_\_\_

How many years have you been teaching in Abaco? \_\_\_\_\_

5. Which community area do you teach in?

- Treasure Cay to Crown Haven (including Green Turtle Cay)
- Marsh Harbour/Murphy Town/Dundas Town
- Guana Cay/Man-O-War/Hope Town
- Cherokee Sound, Crossing Rocks, Sandy Point and Moore's Island

6. Before receiving this survey were you familiar with Friends of the Environment (FRIENDS)?

Yes

No

7. If you answered "Yes" to the previous question (#6) how did you find out about FRIENDS?

- Newspaper
- Radio
- Television
- Online
- A program given at your school
- From a friend or colleague
- From a Friends of the Environment staff person or Board member
- A newsletter
- Not applicable

8. How often do you seek help from the following sources regarding materials or other needs for implementing the science curriculum? Please check the most appropriate box for each answer.

	Never	Rarely	Sometimes	Quite Often	Very Often
Colleagues					
Administrators					
Library					
Online Resources					
Friends of the Environment					
Text Books					
Other Sources					

9. Please check the most appropriate response:

	Very Difficult	Difficult	Neutral	Easy	Very Easy
How easy is it for you to get the resources you need to teach science and related topics?					

10. Did you know that Friends of the Environment has a resource library (books, articles, DVDs, activities and lesson plans) for your use, and offers free in-class presentations and assistance with field trips to explore Abaco’s environment? Check all that apply.

- Resource Library
- Presentations
- Field Trips
- I didn't know about any of these options

11. Please check the most appropriate response regarding your needs for curriculum materials:

	No	Not Likely	Likely	Very Likely	Definitely
If you needed help with materials for science-related lessons would you ask Friends of the Environment for help?					

12. Which method of communication would you be most likely to respond to? Please rate them from 1-6 with 1 being most likely and 6 being least likely.

- \_\_\_\_\_ Email
- \_\_\_\_\_ Phone Call
- \_\_\_\_\_ Letter
- \_\_\_\_\_ Fax
- \_\_\_\_\_ Hardcopy newsletter
- \_\_\_\_\_ Personal Visit

13. Which avenues would you be most likely to take in seeking resource materials from FRIENDS, if available?

	Highly Unlikely	Not Likely	Neutral	Likely	Very Likely
Website					
E-Newsletter (via email)					
Phone Call					
Visit to FRIENDS' Center in Marsh Harbour					
Hardcopy newsletter specifically for educators					

14. What additional resources could FRIENDS provide that would be helpful to you as a teacher of the sciences?

15. Have you ever seen a copy of the E-FRIENDS Newsletter for Educators?

Yes

No

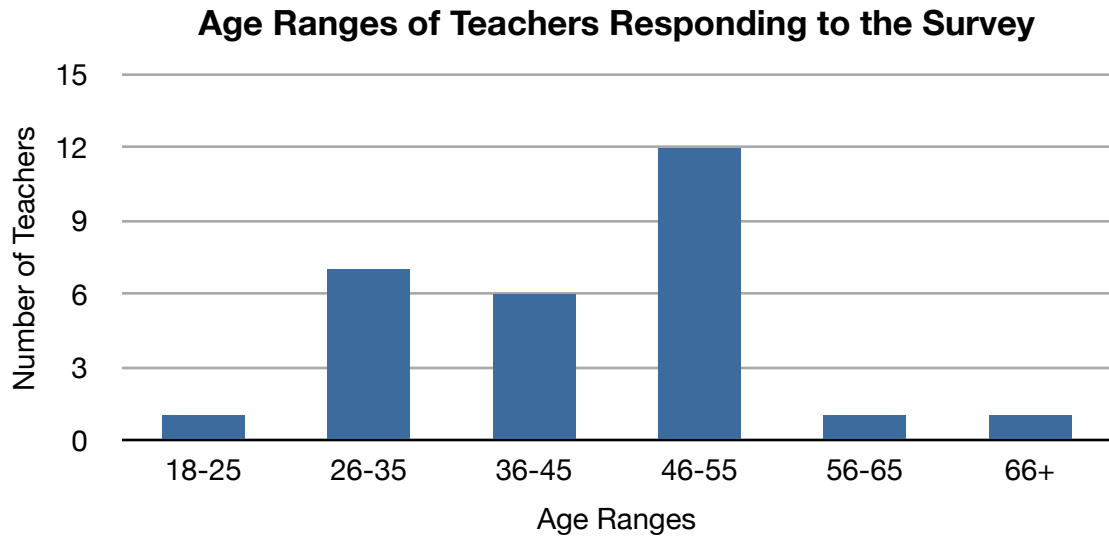
16. Please use this space to share additional information on resources that you need, questions that you have, or any other comments that you would like to share:

## Appendix B

A selection of answers to the open response question (#14) “What additional resources could FRIENDS provide that would be helpful to you as a teacher of the sciences?”

I have just started the science program at [school name] and yes I could use all the help I can get. I am aiming for a "Green School". Right now we are removing the many, many Brazilian Pepper Trees, recycling paper, composting, and cutting back on [electricity and water bills]. It is a start, but this is all new to me.
An itemized list of materials or topics covered. (Book list, curriculum guides, field trip ideas list, posters and videos list)... A better idea as to what materials are available and the expertise in different scientific areas.
Contacts with scientists
Distribute DVD's of resources available to the schools
Videos
More field trips, or accessible ones
Presentations
Materials to help with science experiments
A projector that could be rented or borrowed.
If we weren't on one of the cays, I would spend more time in the [FRIENDS] resource library looking for resources. The distance, cost, and time prohibits the use. However, if we know what we are needing we often can ask someone who comes regularly to Marsh Harbour to pick up materials or supplies.
None that I can think of.
2 or 3 times a year have a presentation.

Appendix C - A graph showing the age distribution of survey respondents (n=28)



## Appendix D

Answers to Question 16: “Please use this space to share additional information on resources that you need, questions that you have, or any other comments that you would like to share”

<p>We would welcome your staff here to share environmental lessons with our students. Just let us know when the time suits.</p>
<p>I will get in touch Olivia, as I will need Friends assistance with this major project. I would also like to arrange more field trips and presentations for my science groups.</p>
<p>Because the center is so far...it would be great to know that they would make classroom visits</p>
<p>Recommended that the organization make themselves more visible in the community.</p>
<p>There are certain pieces of equipment that we as a school can't purchase for one unit a year. It would be nice to have metric or balance scales that work. Also other science equipment that you need for once or twice a year.</p>
<p>A science kit. Curriculum containing names of indigenous plants that can be used for medicinal purposes.</p>
<p>It is a wonderful program, however, more up to date shows need to be put on television and available. Advertise information on more radio stations and ch.40/parliament ch.</p>