

Survey of In-service teachers who have taken F.T. Stone Laboratory Courses: Outcomes and Impacts

**By
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A. Background of the study

F.T. Stone Laboratory is The Ohio State University's island campus, located on Gibraltar Island, lying at the entrance to Put-in-Bay, South Bass Island, Ohio. The campus includes dormitories for students living and working on the island throughout the summer, cottages for guest housing and instructors, the Stone Laboratory Building for research and classroom space and of course the historic Cooke Castle. The campus also provides food service and maintains a dining hall for students, instructors, researchers and guests throughout the summer. Since Stone Laboratory's establishment in 1895, scientists and students have been conducting research on the ecology, and physical characteristics of Lake Erie and the Great Lakes region (Stone Laboratory 2001).

Stone Laboratory or "Stone Lab" is a research institution; however, it is probably most well known for its education and outreach programs. Courses are available every summer for high school students, college students (undergraduate and graduate) as well as in-service teachers, which is the focus of this research. Since 1990, Stone Lab has been offering summer courses and workshops to teachers as professional development opportunities offered for college credits (Stone Laboratory 2001). The courses meet for one-week and include topics such as oceanography, entomology, ornithology, global climate change, geology of Lake Erie, limnology, aquatic biology, stream ecology, just to name a few. The teachers live and attend the courses on the island during this one-week time period. The courses involve lecture, research as well as the all important field experience component. Much research has focused on teacher professional development and the evidence is clear that teachers wish for opportunities to study in the real world and thus improve their teaching skills (Stowitschek, Cheney & Swartz 2000). Such experiential professional development opportunities are available at Stone Lab. The teachers who attend Stone Lab are mostly K-12 instructors, however, there are many nonformal educators that also elect to attend these courses.

B. Rationale for the pursuit of the problem

The teacher targeted courses offered at Stone Lab are often times cited by the respondents in the final course surveys as being the "best course I ever had" or "I never knew this could be so interesting..." or "can hardly wait to use this in my classroom". Research indicates that teachers desire professional development that has a clear focus in a subject area or teaching method as well as focuses on the teachers' needs and interests (Vukelich & Wrenn 1999). There is clearly a wide range of take-home values for the teachers who have attended the courses at Stone Lab. Furthermore, many of the teachers who have taken the courses at Stone Lab have returned year after year to take more courses. The teachers attending these courses must have experienced some true value in the courses in order to elect to return year after year. It is also notable that some studies indicate that supportive and collegial environments, which include camaraderie and

support within the context of the professional development, are necessary for teachers to get the most out of their experience (Sandholtz & Dadlez 2000). This is certainly true of the courses offered to teachers at Stone Lab. Other studies indicate that teachers are in need of inservice on environmental education topics and that such training will lead to better understanding and confidence in science and they will be better equipped to teach such topics (Littledyke 1997). The courses at Stone Lab are most all related to some aspect of environmental education and seem to satisfy the needs of teachers who desire more knowledge in the environmental sciences.

Since the implementation of teacher targeted courses at Stone Lab, there has been little study of the effects these experiences have had on the methods and subject matter these teachers use in their classrooms. It was determined based on casual discussion with many teachers involved in the Stone Lab program that such research on the effects and outcomes of the Stone Lab professional development experience would be beneficial. It is further noted that the planners of the Stone Laboratory curriculum may use the information generated from this study. The following objectives were determined before the study was initiated:

- Determine the reasons why teachers take courses at Stone Lab.
- Determine how teachers have benefited professionally and personally from their Stone Lab experience.
- Determine how teachers are using the information gathered at Stone Lab in their own classrooms.
- Determine if the Stone Lab experience has caused changes in teaching methods or information presented in the classroom.
- Determine if there is benefit from the collegial interactions experienced with other teachers while at Stone Lab.
- Determine any areas of improvement that may be made to the courses offered in the future.

C. Methods

1. Academic setting for this study

This study is a part of the requirement for a Masters of Science in Natural Resources at The Ohio State University. The study was completed as a personal research project and was applied to the Institutional Review Board for exemption. The protocol number for this project is 02E0165. The project began on May 1, 2002 with mailings to the teachers involved and the research was to be completed by June 15, 2002. The method of survey was chosen for the type of research in this project. The reason why a survey to be administered through the mail was chosen was because the research questions are what, why, and how type questions. Furthermore, the research is not based on control over the events experienced at Stone Lab but rather an analysis of contemporary issues or how teachers have used or benefited from the experience (Yin 1994). This research involves the opinion of the teachers who have taken courses at Stone Lab and a large group of respondents was necessary to validate the information and to describe the aspect or characteristics experienced and the outcomes of said experiences (Fraenkel and Wallen

1996). Finally, a survey conducted through the mail is the most economic method of collecting data in this research process.

2. Survey Development

The survey was developed with the objectives listed under “Rationale for pursuit of the problem” and it was determined that the survey should be short, entailing only 5-10 minutes of the respondents time in order to encourage response. The questions developed were very general and allowed for different responses, as the respondent would feel appropriate. Also, a cover letter was developed to explain the purpose of the project and encourage response (Figure 1). The survey was pilot tested with two teachers and their input was incorporated into the final survey (Figure 2). Respondents were supplied a self-addressed stamped envelope in which to return the completed survey. When the survey was returned, the respondent was to have a thank you “gift” sent. This gift is a flag lapel pin and was also sent via the mail.

3. Sampling

The sample of teachers to be surveyed was determined to be the group of teachers who have taken courses more recently. Therefore it was decided that all the teachers who have taken courses at Stone Lab between the years of 1999 and 2001 were selected. The names and addresses were obtained from The Ohio State’s Stone Laboratory office on campus in Columbus. The list included 105 teachers who have taken summer courses at Stone Lab during the 1999 to 2001 time period. Another list of addresses that contained email addresses for the respondents was also obtained from a colleague from a previous research conducted in the fall of 2001. The Stone Lab office was also generous enough to supply mailing labels to be affixed to the envelopes that contained the surveys.

4. Survey Administration

The surveys were sent in the mail to the potential respondents on May 3, 2002. There were two surveys that were returned with incorrect addresses, therefore those individuals could not be surveyed, and this reduced the list to 103 possible respondents. Responses began arriving and approximately 56 completed surveys had been received by May 29, 2002. There were 18 non-respondents that had email addresses listed on the address list received from a colleague and they were contacted via email; this was followed up by a phone call to the same group who had been emailed. By June 17, 2002, a total of 69 completed surveys had been received and analyzed. The analyzing technique used was to make hash marks next to statements that were generated from questions listed on the survey; many statements were repeated from one respondent to another. Also, the responses from questions that were strongly agree, agree, neutral, disagree, strongly disagree were also recorded and a table (Figure 3) was developed to view the general trends in the data. The response rate for this survey is 67% and indicates that many of the respondents have a vested interest in the courses they have taken at Stone Lab. Those surveys not returned or the nonresponse in this project may be the result of a lack of time or interest on the part of the respondent or unwillingness to be surveyed (Fraenkel and

Wallen 1996). Another reason for nonresponse may be that those individuals only view Stone Lab as a simple vacation experience and not an important part of their professional development. Several of the respondents even made comments at the end of the survey that they were very close to retirement and do not have an interest in future professional development, therefore this may be another reason why some teachers did not respond.

D. Results

1. Demographics of respondents

This subjects surveyed in this project are all educators; most are K-12 general/science educators, and a smaller portion of the group are nonformal educators. This population was chosen not based on years experience or other factors like age or sex, but on the time when they attended Stone Lab. All of the educators surveyed attended Stone Lab between 1999 through 2001 (summers), many of the teachers indicated a return to Stone Lab in successive summers or in time periods earlier than 1999, however, and they all were at Stone Lab at least between 1999 and 2001. Most of the educators surveyed have taken more than one course at Stone Lab and many offered comments on the different experiences in the different courses.

2. Reported information (Stone Lab courses)

- a. What courses were taken at Stone Lab?
- b. Why take the course?
- c. What value does this course have for a professional?
- d. How is the material used in the classroom?
- e. Data Table (Figure 3)
- f. Why take Stone Lab courses in the future?
- g. What professional impact did the course have?
- h. What personal impact did the experience impart?
- i. Suggestions for improvement.
- j. Additional comments.

3. Knowledge and Attitude/ Relationship of variables

a. What courses were taken?

The teachers indicated the courses they attended on the survey. The most popular course attended by the respondents was Ornithology (39% of respondents). The following courses were also reported in decreasing rates of attendance: Geology of Lake Erie (32%), Oceanography (30%), Entomology (26%), Global Climate Change (23%), and Great Lakes Education Workshop (22%). Several other courses were mentioned as being attended by only a small number of respondents: Projects Wet, Wild, Wow Workshops (6%), EPA Research Vessel (6%) Great Lakes Limnology (3%), Stream Ecology (3%), Aquatic Biology (1%) and the Marine Ecology of a Coral Reef, Jamaica (1%).

b. Why take the course?

There were many reasons the respondents indicated for taking the courses they attended. However, the most common reason indicated was personal interest in the topics included in the course (41% of respondents). The next most common reason they took the course was to obtain college credit (35%). Many respondents indicated that the course was used to upgrade or renew their teaching certificate (17%). Some of the respondents also included the increase on the pay scale in their district was a motivating reason to take the course (6%); some said that this was the initial reason they took the course but then continued in successive years due to personal interest in the topics taught. Many respondents indicated that the hands-on and field experience component was very important to them and an important reason for taking the course (12%). Other reasons listed for taking courses at Stone Lab include the beautiful surroundings of the island or the fact that the area is a “great place to learn” (12%), as well as the “educational” vacation aspect (11%). Some teachers indicated that the courses were taken as preparation for teaching a new unit in the classroom or to implement information into the classroom required by state grants or to match their course of study (6%) or to increase skills in the subject area (9%). Other comments made include that the courses are research-based and high quality (3%), the courses could be taken with a friend, family member or a close colleague (8%) or simply for networking with other teachers (6%). Some teachers indicated that their advisor initially recommended the course but then they continued to take other courses later (3%).

c. What value does this course have for a professional?

The value of these courses for professionals were most frequently listed as the increase in knowledge and confidence as a teacher (44 % of respondents), not only did the teachers include knowledge by itself but the fact that it gave them greater confidence for teaching those topics in the classroom. Many teachers listed the ability to use materials in their classroom as the value of the course (29%). Many teachers found the focus on local issues as valuable (6%), whereas other teachers mentioned understanding the environmental impact that humans have as valuable (3%). Some of the teachers felt it was important for a professional to learn how fieldwork is done in a hands-on fashion (9%). Another value of the course professionally is the networking with other teachers from around the state made available throughout the course (5%). Some teachers made comments like the course “changed my assessment methods of my students” or “I am very interested in the subject as a result of having taken the course” or “enjoyed the exposure to timely information”.

d. How is the material used in the classroom?

Many of the teachers surveyed indicated that unfortunately, their teaching assignment has changed. Therefore, they do not use the information learned at Stone Lab in their classroom because they are presently teaching a different subject or it is not applicable to the age level of the children they presently teach (15% of respondents). For those teachers who do still teach in areas related to

subjects learned at Stone Lab, they have found that creating new lesson plans has been an important part of what they learned (8%). Also many teachers mentioned that they use several of the activities from the Great Lakes booklets that were used in some of the classes (9%). Other teachers find use of personal collections of insects, fossils or photos they took on field trips to be important to supplement to topics taught in their classrooms (14%). Some teachers mentioned their ability to now assign rock or insect collections as student assignments as a result of the information and confidence they gained in the courses. Some of the teachers indicated that they use field experiences similar to those experienced at Stone Lab with their own students now (9%); some indicated specific areas like water chemistry/sampling/levels as being integrated into their classroom studies (11%). Some teachers mentioned specific lessons they learned at Stone Lab that are now used in their classrooms including the following: ocean currents, entomology and evolution, zebra mussels and other non-native species, wetlands, endangered species (specifically the bald eagle and Lake Erie water snake), stream ecology and quality indexing, strip mining and minerals, dichotomous keys/classification or identification, pollutants and water quality, animal migrations, algae identification, concept maps, maple seed migration. A few notable comments made on the some surveys include “I am now able to prepare an envirothon team” and “I have a lot of interesting stories to relate to students now”. Some teachers have even invited guest speakers to their classroom as a result of their experience as well as improved the school district’s (science) web site with information gathered at Stone Lab.

e. Data Table (Figure 3)

% of respondents*:

Statements on the survey:	SA	A	N	D	SD
I use concepts I learned at SL regularly in my classroom.	20	39	15	19	7
I feel the course(s) I have taken at SL have greatly improved my science knowledge.	49	36	6	9	0
I learned new and exciting teaching methods in the course I took at SL.	20	42	17	13	7
I have benefited positively from the collegial interactions I experienced at SL	57	32	6	4	1
My teaching practices have changed as a result of my experiences at SL.	15	30	32	14	9
The course(s) I have taken at SL have value to me beyond simple classroom application.	65	30	4	0	0
The course(s) I have taken at SL stimulated me to learn more about the environment.	48	43	6	1	0
I feel that certain courses offered at SL have more value than others.	17	29	42	4	0
Overall, the course(s) I have taken at SL are the best I have had.	35	26	26	13	0

*Note: SA=strongly agree A=agree N=neutral D=disagree SD=strongly disagree

** See *Appendix 1* for spreadsheet analysis and correlations of data sets.

f. Why take Stone Lab courses in the future?

The most widely reported reason for taking courses in the future would be to expand personal science knowledge and interest in the topic or to prepare to teach a new area (44% of respondents). Many respondents indicated the excellent location of Stone Lab and the fun; get-away aspect of the campus would be a good reason to continue taking Stone Lab courses (32%). Many teachers mentioned that the hands-on, field-based work that is practiced in the courses at Stone Lab would be an attractive reason for taking future courses (23%). One of the things that some respondents enjoyed about the summer courses offered is that they are completed in one week and at the same time, the short time period involved allows complete immersion in the topic and some feel they are better able to learn in this way (11%). An important factor for some is to be able to relate what is learned in the course to the curriculum taught in their classrooms (8%). Other teachers felt that it is important for them to learn how to use field techniques to take back to their students and this is a motivating factor for taking additional courses (5%). Some teachers said they require the environmental topics (including soil, air and water issues) to help teach these topics in their classrooms (5%). Several respondents indicated that the experiences they have at Stone Lab

give them credible information to use with students in the classroom (3%). A few teachers said the courses available are some of the best ways to obtain graduate credit for certificate renewal/upgrade or increase on their district's pay scale (5%). Some notable comments made by the respondents when asked why they would take future courses are as follows:

- “There are few places to get science courses if you are not a ‘science’ person”
- “Something for everyone”
- “The professors are experts in their area of study and I appreciate this”.

g. What professional impact did the course have?

Most teachers noted that the most important impact they experienced as a result of the course was to gain knowledge, confidence and enthusiasm in the area (39% of respondents). Some felt as a result of the new knowledge they gained they now have more interest in certain areas (9%). Others felt that the course imparted them with greater credibility as a science teacher after having experienced the course at Stone Lab (8%). One of the most important topics mentioned was that the course at Stone Lab gave them an awareness of environmental issues they were previously unaware of, especially issues, which effect us locally (9%). Some teachers benefited from the teacher networking they were able to do while at Stone Lab (8%). Certain teachers felt that the activities/resources they gathered while at Stone Lab are meaningful and expand their teaching expertise in those areas (6%). Some teachers even mentioned that as a result of attending the course at Stone Lab they have reevaluated their teaching and assessment techniques and their teaching strategies have changed (6%). Some respondents indicated that the course was part of their masters program or that it has increased their pay in the district in which they teach (5%). Certain teachers indicated an enjoyment of the more relaxed relationships with the professor or instructor who taught the course (3%). Some interesting comments made include the following:

- “The course made me realize that I really love what I teach.”
- “Made me realize I would like to do some nonformal environmental education.”
- “Rekindles the spark that originally lured me into teaching.”

h. What personal impact did the course have?

The most important personal impact that the teachers experienced is the ability to meet and network with teachers from all around the state and beyond (39% of respondents). Many teachers indicated that they have developed an appreciation for the resources and environment of the Great Lakes and this has changed their personal outlook on certain topics (39%). Many teachers found the courses to be relaxing and enjoyable (14%), while others have developed more interest in biological topics now (9%). Many teachers made unique comments about the experience as it has affected them personally, they are as follows:

- “The most intensive week of learning in one week, but so much fun!”
- “I enjoy the work of ‘being a scientist’ personally.”
- “The experience convinced me to become a science teacher and move to a different area.”

- “The courses stimulated me to pursue my Ph.D. studies with a focus on the Great Lakes”
- “I met my fiancé at Stone Lab!”
- “I feel I have discovered a secret aspect of OSU.”
- “The course was a ‘once in a lifetime’ experience.”
- “I appreciate the respect the staff has for teachers.”
- “The courses was the most satisfying and fun professional development experience I’ve had in 26 years of teaching”

i. Suggestions for improvement

Most comments made on the surveys were very positive and numerous individuals indicated that there is no reason to change anything at Stone Lab. However, the most common suggestions included adding more and different courses. Some course suggestions include the following:

- Topics such as Hazardous wastes/Superfund site education, butterflies, weather, herpetology, soil/water chemistry topics, botany, SCUBA underwater zoology, follow-up to other courses such as entomology and oceanography, integrated courses of science with literature/art/music/history (Some respondents indicated that inviting new professors to teach some of these courses may be necessary).
- Create more courses “off-campus” like the Jamaica “Coral Reef” or “Stream Ecology” at Old Woman Creek courses.
- Increase the number of day or weekend only courses.
- Increase the science/problem-based courses, reduce lesson-planning aspects.
- Provide more handouts on how certain demonstration are planned and/or executed or allow teachers to do these demonstrations themselves. Also, offer labs and activities that can be done in the classroom with few supplies.
- Publish or make information on upcoming courses available earlier.
- In some cases, do less lecturing during the class and more application of concepts for use in the classroom.

Some other suggestions made include the issue of making air conditioning available in the dorms or in the classrooms to increase the comfort of the participants. Some respondents felt they would even be willing to pay extra for a private bed. Finally, one concern mentioned by several respondents was the cost of attending Stone Lab. They mentioned the possibility of making more scholarships available to teachers especially elementary teachers who can really benefit from the field experiences available at Stone Lab. Some other respondents indicated that it would be nice to have a discounted rate if you are only taking the course for personal interest and you do not require it for college credit.

j. Additional Comments

The respondents added many comments at the end of the survey, some of the comments were positive like “thanks for the experience!” or “I had a great time”. Some of the respondents reiterated the idea that they feel that more scholarships or funding should be made available to teachers, several even mentioned that perhaps a lottery or stipend be made available to teachers to help defray the cost

of attending Stone Lab. One respondent mentioned the “Friends of Stone Lab” organization and the ability to be able to give back to Stone Lab by financial contributions to the organization. Some comments were made in regards to information to be given to first time attendees of Stone Lab and to make sure that it is clear to them the intensity of the experience and amount of work involved in a condensed one-week course accompanied with the many field experiences. Some said that it could be a little overwhelming to experience so much with the heat, close living quarters and expectations of the course. Some teachers were concerned with the idea that the courses are to be teacher primarily courses and not just general field courses. Others indicated that they go to Stone Lab to experience and learn science and they do not want watered down content but a very intensive learning experience. Many comments were made in regards to the instructors and professors. Some respondents remarked about the poor quality of some instructors while others raved about the excellent quality of other instructors. One respondent said that certain instructors “make the program as good as it is”, comments were made that some instructors are “excellent, very knowledgeable and helpful”. Many respondents remarked that due to the excellence of the overall experience, they have recommended Stone Lab to others and plan to continue taking more courses in the future.

In regards to public relations of Stone Lab, some respondents indicated a concern for the information to be available first-hand to teachers. It seems that in some cases, teachers were not notified directly but information was lost in the administrative offices of some schools. It seems that they feel that Stone Lab needs to be marketed to the individual teachers and not the school systems in general. One final comment of interest made by a respondent is the idea that there should be a component in which teachers would be able to regroup some time during the school year and share ideas on how the information has been applied to their classrooms. Perhaps this component could be done via videoconferencing in order to reduce the need to travel back to Stone Lab. This type of event may also allow teachers to recommend new areas of study or possible courses to the planners of Stone Lab during this videoconference.

E. Discussion

1. Interpretation of Findings

These research findings indicate that the main reason most respondents have taken courses at Stone Lab is to increase their knowledge in the different areas of science. Many respondents felt that one of the keys to the success of the Stone Lab program is that they are learning science first-hand, in a field-based setting. Previous researches as well as this study indicating that teachers desire camaraderie and collegial interactions in their professional development experience (Sandholtz and Dadlez 2000) have been supported. Many respondents indicated a satisfaction with the experiential aspect of Stone Lab and that the methods employed as putting teachers in the position of the scientist and the

researcher are also supported by this study as well as others (Stowitschek, Cheney and Schwartz 2000).

For many teachers who have taken courses at Stone Lab there is indeed a wide-range of take home values. Teachers listed numerous activities they have used in their classrooms as a result of the professional development experience. The experience has broadened many of the respondents' horizons and has even led them to areas where they may have previously had marginal interest. It is true that teachers need to continuously add to their repertoire of lessons and knowledge. There seems to be a definite trend that the respondents feel that more knowledge equals greater confidence and greater confidence imparts greater enthusiasm; it appears that Stone Lab delivers the knowledge. Other studies indicate that teachers do realize that in order to do environmental education, they require tools and knowledge (Littledyke 1997). The courses available to teachers at Stone Lab appear to meet this need that teachers require in order to be trained in environmental education.

When the respondents were asked if their teaching methods have changed as a result of the concepts and techniques learned at Stone Lab there does not appear to be a definite trend. However, some individual respondents were adamant that they have completely over-hauled their teaching and assessment techniques as a result of the experience. Others indicated that very little has changed in their teaching strategies. This could be due to the fact that many respondents indicated that they are not presently teaching in areas applicable to Stone Lab content. It may also be due to the idea that most educators are not truly aware of what has caused the evolution of their teaching style and cannot pinpoint one specific experience that has made a difference.

Teacher networking appears to be one of the most important benefits of attending Stone Lab. In short answer questions asked on the survey, respondents repeated the benefits of teacher networking. Some respondents insisted that the relationships forged at Stone Lab might even continue years beyond the initial experience. The teachers in the collegial relationships they develop are able to grow and develop as well as trade and develop new lessons as part of their experience. This is always a very important benefit of the most excellent professional development activities, especially when so many teachers in their daily teaching schedule feel as though they are working "behind closed doors". Teachers who participate in excellent professional development are able to work collaboratively and engage in a constant dialogue with one another to develop curriculum, experiment and solve real problems (Vukelich and Wrenn 1999). Stone Lab is a unique setting in which teachers have the time and are encouraged to work together to develop new lessons, experiment, solve problems and reflect on pedagogy. This is indeed the reason why so many teachers surveyed enjoy and thus benefit from collegial interactions.

Finally, in conclusion, teachers surveyed in this study seems to have many ideas for the future of Stone Lab. Some comments included adding courses and others mention the physical aspects for improvement. However, the most widely cited issue that limits the appeal of Stone Lab to some is the financial restraint. It can be expensive to attend Stone Lab especially for beginning teachers. Some

respondents suggest the development of additional scholarships for teachers in order to facilitate their ability to attend.

2. Suggestions for use of findings

The planners of Stone Lab will most likely benefit from the results of this study. The respondents in this survey have made some valuable comments that indicate how they feel about the courses available in the summer at Stone Lab. Most teachers made comments for improvement that include addition of different types of courses, improvement of the facilities as well as improvement for teacher discussions to continue later even after the course has been completed. It would be worthwhile for the planners of Stone Lab to take into consideration the desire teachers have to continue dialogue as a group and create possible additional class meetings via videoconferencing or interactive distance learning modules.

One major aspect of Stone Lab that seems to be important to teachers is the increased availability of scholarships, stipends or lotteries for additional financial support. Perhaps in working with the "Friends of Stone Lab" it would be possible to establish a new scholarship to help teachers in financial need or teachers in need of the field experiences with the monetary burden of attending Stone Lab.

3. Suggestions for enhanced research

Some possible sources of enhanced research may be to interview teachers that have taken courses at Stone Lab. This may be beneficial because the interviewer may be able to gather data that was not readily apparent on a written survey. Also, in an interview, the researcher may encourage the respondents to elaborate on experiences or activities used in the classroom. Perhaps responses could be solicited from teachers that attended Stone Lab as far back as the early 1990s to find out more about the long-term effects of the courses. Another possible dimension that could be added to this research would be to use a control teacher group and a Stone Lab teacher group and compare the results of their experiences in their professional development. Finally, it would be a good idea to continue to solicit response from teachers. There may have been some that did not respond due to time limitation or simple forgetfulness. In some cases, they may be willing to respond if reminded again.

Figure 1: Cover letter sent with the survey

April 30, 2002

Dear Educator,

My name is Lisa Bircher and I am conducting this survey as part of my requirements for a Masters Degree in Natural Resources through The Ohio State University. I am a student of Dr. Rosanne Fortner and I am attempting to ascertain the impact that Stone Laboratory courses have had on educators in their professional development experiences.

I hope you are willing to participate in a survey of educators who have taken professional development courses at Stone Laboratory through The Ohio State University. The survey is a short, 5-10 minute survey that is attempting to determine the impacts and outcomes that these courses have had on your professional experience.

I hope that you will feel free to comment candidly throughout the survey. Your name will not be used in any report that is generated using the information you have provided.

Thank you for your time and cooperation in this survey. I will send you a FREE American flag lapel pin when you return the completed survey to me. I look forward to reading your survey and your opinions of Stone Laboratory.

Please complete the enclosed survey on or before **MAY 15, 2002** and use the self-addressed, stamped envelope for your convenience. If you have any questions pertaining to this research or need longer for getting your response submitted, please contact me using my email, epal_lb@ACCESS-k12.org and let me know when to expect it. Thank you again for your cooperation.

Sincerely,

Lisa Bircher
Researcher

**Figure 2:
Stone Lab (SL) Teacher Survey**

Name _____ Date _____

Background:

1. When did you attend Stone Lab (SL)? Summer _____
2. What course(s) have you taken at SL? _____

3. Why did you take this course(s) at SL? _____

4. What value did this course(s) have for you as a professional teacher? _____

5. Give an example of how have you used information you gathered at SL in your classroom. _____

Survey:

For each statement, please indicate your level of agreement by circling the letters according to the following scale:

SA= Strongly Agree A= Agree N= Neutral D= Disagree SD=Strongly Disagree

- | | | | | | |
|--|-----------|----------|----------|----------|-----------|
| 6. I use the concepts I learned at SL regularly in my classroom. | SA | A | N | D | SD |
| 7. I feel the course(s) I have taken at SL have greatly improved my science knowledge. | SA | A | N | D | SD |
| 8. I learned new and exciting teaching methods in the course(s) I took at SL. | SA | A | N | D | SD |
| 9. I have benefited positively from the collegial interactions I experienced at SL. | SA | A | N | D | SD |
| 10. My teaching practices have changed as a result of my experiences at SL. | SA | A | N | D | SD |
| 11. The course(s) I have taken at SL have value to me beyond simple classroom application. | SA | A | N | D | SD |
| 12. The course(s) I have taken at SL stimulated me to learn more about the environment. | SA | A | N | D | SD |
| 13. I feel that certain courses offered at Stone Lab have more value than others. | SA | A | N | D | SD |

14. Overall, the course(s) I have taken at SL are the best I have had. **SA A N D SD**

Final:

15. What reasons would you list for taking future courses at SL? _____

16. How have the course(s) you have taken at SL impacted you professionally? _____

17. How have the course(s) you taken at SL impacted you personally? _____

18. What would you like to suggest as improvement for teacher courses offered at SL in the future?

19. Any additional comments:

Thank you for your cooperation with this survey!

Appendix 1 Spreadsheet Analysis of Data:

Respondent	Latest Year Course Taken	Number of Courses Taken	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	AVG 6-14	AVG 6-12,14
1	2001	3	4	4	4	5	4	5	5	4	5	4.444444	4.428571
2	2001	3	4	5	3	4	4	5	5	2	3	3.888889	4.285714
3	2001	1	3	3	4	5	3	5	4	4	3	3.777778	3.857143
4	1999	1	5	5	5	5	5	5	5	3	3	4.555556	5
5	2001	5	5	4	3	5	4	5	4	5	5	4.444444	4.285714
6	1999	1	4	4	5	5	4	4	5	4	5	4.444444	4.428571
7	2001	2	4	4	2	3	3	4	4	3	3	3.333333	3.428571
8	1999	1	2	3	3	5	2	4	4	5	3	3.444444	3.285714
9	2001	1	5	5	1	5	3	5	5	3	5	4.111111	4.142857
10	1999	2	3	5	3	5	3	5	4	3	5	4	4
11	1998	1	4	4	4	4	4	4	5	3	4	4	4.142857
12	2000	2	2	4	4	4	4	4	3	3	4	3.555556	3.571429
13	2001	5	4	5	5	5	4	5	5	3	5	4.555556	4.714286
14	1998	1	4	5	3	5	3	5	5	4	5	4.333333	4.285714
15	2000	2	4	5	5	4	3	5	4		4	4.25	4.285714
16	2001	5	4	5	4	5	4	5	5	5	5	4.666667	4.571429
17	1998	5	5	5	4	4	2	5	4	3	4	4	4.142857
18	1999	1	3	2	2	4	2	4	4	3	2	2.888889	3
19	2000	5	5	5	5	5	5	5	5	5	5	5	5
20	2000	1	4	3	4	4	3	4	4	3	2	3.444444	3.714286
21	1999	5	2	5	4	5	4	5	5	4	5	4.333333	4.285714
22	1999	2	2	2	3	1	2	5	4	3	2	2.666667	2.714286
23	2001	1	2	4	3	5	3	3	4	4	3	3.444444	3.428571
24	1999	2	4	5	4	5	5	5	5	3	4	4.444444	4.714286
25	1999	1	5	5	3	5	4	5	5	3	3	4.222222	4.571429
26	1999	1	3	5	4	5	3	5	5	5	5	4.444444	4.285714
27	2001	2	5	5	4	5	3	5	5	3	2	4.111111	4.571429
28	2001	3	4	4	5	5	4	5	5	5	4	4.555556	4.571429
29	2001	4	4	4	5	5	5	5	5	4	4	4.555556	4.714286
30	2001	1	1	5	4	4	1	5	4	4	4	3.555556	3.428571
31	1998	5	5	5	5	5	5	5	5	5	5	5	5
32	1999	1	2	5	1	2	2	5	4	3	3	3	3
33	2000	4	3	5	4	5	4	5	5	4	3	4.222222	4.428571
34	1999	1	3	4	4	3	3	4	4	3	5	3.666667	3.571429
35		5	5	5	5	5	5	5	4	4	5	4.777778	4.857143
36	2000	1	3	4	4	4	3	5	5	4	4	4	4
37	2001	6	5	5	5	5	4	5	5	4	5	4.777778	4.857143
38	2001	2	1	2	1	4	1	4	2	4	2	2.333333	2.142857
39	2000	1	4	4	4	4	4	4	5	4	4	4.111111	4.142857
40	1999	1	3	4	2	3	3	5	4	3	3	3.333333	3.428571
41	2001	1	5	5	3	4	3	5	4	3	5	4.111111	4.142857

Respondent	Latest Year Course Taken	Number of Courses Taken	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	AVG 6-14	AVG 6-12
42	1999	2	4	5	4	4	3	5	5		5	4.375	4.285714
43	1999	1	4	5	5	5	5	5	5	5	5	4.888889	4.857143
44	2000	2	4	4	4	3	4	5	4	4	3	3.888889	4
45	2001	1	1	5	4	5	3	3	4	5	5	3.888889	3.571429
46	2001	5	5	5	4	5	5	5	5	5	4	4.666667	4.857143
47	2000	4	4	5	4	5	5	5	5	5	3	4.444444	4.714286
48	2000	1	4	5	4	5	3	4	4	4	3	4.111111	4.142857
49	1999	2	5	4	5	5	5	5	5	5	3	4.666667	4.857143
50	2000	1	3	5	4	4	4	4	4	4	3	3.888889	4
51	1999	1	2	4	2	4	2	4	4		3	3.125	3.142857
52	2001	3	2	5	4	4	3	5	5	2	5	3.888889	4
53	2000	2	4	5	5	5	3	5	3	3	5	4.222222	4.285714
54	2000	1	2	5	2	5	2	5	4	3	5	3.666667	3.571429
55	2000	1	1	3	2	4	1	4		3	2	2.5	2.5
56	2001	1	2	2	2	4	2	4	4		2	2.75	2.857143
57	2001	3	4	4	3	4	2	4	3		2	3.25	3.428571
58	2000	1	4	4	5	5	4	4	5	3	4	4.222222	4.428571
59	2001	3	4	4	3	5	4	4	4	4	4	4	4
60	2001	2	3	2	3	4	3	3	5	4	3	3.333333	3.285714
61	2001	5	4	5	4	4	4	4	3	4	5	4.111111	4
62	2001	1	3	4	1	5	1	4	4	3	2	3	3.142857
63	2000	1	2	4	2	2	2	5	4	3	3	3	3
64	2001	3	5	5	4	5	1	5	5	4	4	4.222222	4.285714
65	2001	2	2	4	2	4	2	5	4	2	3	3.111111	3.285714
66	2000	1	1	2	1	2	1	4	4	3	3	2.333333	2.142857
67	2001	1	4	4	4	5	4	5	4	5	3	4.222222	4.285714
68	2001	1	4	4	4	5	4	5	5	5	4	4.444444	4.428571
69	2001	1	4	4	4	5	3	5	5	5	3	4.222222	4.285714
Averages:			2.19	3.48	4.26	3.55	4.38	3.26	4.61	4.40	3.64	3.84	

- Correl #courses & Avg. 6-14 0.478
- Correl #courses & Avg 6-12 0.466
- Correl #course & Item 14 0.355
- Correl #courses & Item11 0.322

Interpretations:

The purpose for this data analysis was to obtain correlations between the respondents' attitudes as a function of the number of courses they have taken. It appears there is a moderate correlation between the average of Items 6-14 and Items 6-12 where more courses were taken. However, the correlation is lower when looking at correlations between the number of courses taken and certain items alone such as Item 11 which is "the course has value to me beyond simple classroom application" or Item 14 "the course is the best I have had". It can be concluded from this information that many respondents that took even a small number of courses at Stone Lab may see value in the course or feel

that it was one of the best courses they have taken in their professional development experience.

This data analysis also indicates that the respondents agree most strongly about Items 7, 9, 11 and 12. This validates previous analysis that teachers who have attended courses at Stone Lab do feel that they have greatly improved their science knowledge, are stimulated to learn more about the environment, have benefited from collegial interactions and that courses have value beyond simple classroom application.

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