WHAT'S UP IN YOUR WORLD? USING A WIKI TO DISCUSS CURRENT ENVIRONMENTAL TOPICS AND ITS EFFECT ON STUDENT SUCCESS

by

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Nancy L. Bryant

July 2011

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ABSTRACT

In order for high school students to appreciate environmental science, they must observe how science affects them personally. This study explored the relationship between online discussion of current environmental topics and the students' motivation to integrate environmental knowledge into their daily lives. Four different types of prompts were posed to Advanced Placement Environmental Science students to discover how various types of prompts affected participation, integration of science topics into daily conversation, and enjoyment of discussion. Students were surveyed and interviewed, discussion comments were reviewed, and student reflections were evaluated to collect data concerning the effectiveness of each type of prompt. Collected data suggests that online discussion increased communication of environmental science content between students and peers outside of the school day. Online prompts incorporating local events as well as those prompts giving students a choice in their responses encouraged more participation.

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INTRODUCTION AND BACKGROUND

Project Background

As a high school science teacher, I am constantly in search of methods to improve integration of science topics into my students' lives – techniques that will help the students see the relevance of science education and encourage critical thinking skills. Most of my students believe that making good grades is important, and assert that getting good grades is an expectation of their parents. However, it seems that so often they leave the "learning" at school and then go off to "real life" until they must return to school again. One of my goals in teaching is to encourage continued learning, both in school and away from school, and to help students understand how this knowledge helps them to make informed decisions as global citizens. I like to see the students engaged in discussion concerning current science issues outside of the regular school day. These actions demonstrate that the students are thinking critically about science topics and are integrating the relevance of science into their lives.

I believe that the students in my science classes at Burlington Christian Academy can improve their critical thinking skills and the integration of science knowledge into their lives. I believe exposure to current events, both globally and in their community, and discussion of those current events will help develop the skills of analysis and integration. In order to accomplish these goals, I have instituted the use of a classroom wiki for my Advanced Placement (AP) Environmental Science classes for the school year. The purpose of the wiki is to allow the students to discuss various environmental topics online, but it also provides general information about the course such as the classroom

schedule and homework. The primary focus of my research is to examine prompts that are useful in encouraging students to integrate science knowledge into their decision making processes.

Secondary questions to be addressed include:

- Which question prompts encourage more participation from students?
- How does continued use of the discussion board affect the quality of student responses?
- Which question prompts allow students to show how principles in environmental science can be integrated into their lives?
- Which question prompts are students most comfortable with?

Teaching and Classroom Environment

For the past four years I have taught high school science at Burlington Christian Academy (BCA). In a given semester my schedule may include any combination of biology, chemistry, environmental science, physical science, and anatomy classes. In the fall semester I taught Advanced Placement (AP) Environmental Science, Honors Biology, and College Preparatory (CP) Biology to 66 students, and in the spring I will teach AP Environmental Science, Honors Anatomy, and Honors Chemistry, with a total of 55 students.

Burlington Christian Academy (BCA), located in Burlington, NC, is a K3- 12 private school with 675 students. Six years ago the board voted to start a high school, so this year will be our second graduating class. Each year we have added another grade level to complete the high school curriculum. There are 106 students in our high school this year,

and we meet in several different buildings, as we do not yet have dedicated high school space. Our school has been successful in developing an academic program with seven different AP courses. About 70% of our students take at least one AP course, with 53% scoring a 3 or better. On the AP scale, a 3 indicates the student is qualified to receive credit for the subject, a 4 indicates the student is well- qualified, and a 5 indicates extremely well qualified. We also have developed a strong sports program, with at least two sports each season for both males and females. Most of our students come from middle class backgrounds with strong support at home for the importance of education. They are somewhat motivated to learn, but many because they know their parents expect "good grades." Our only ethnic diversity comes from exchange students; otherwise the high school at this point is composed of students of Caucasian descent. The town of Burlington is located in the triad of North Carolina, about midway between Greensboro and Raleigh, two larger urban areas.

CONCEPTUAL FRAMEWORK

Teaching high school science involves a perpetual balance between attempting to cover the material required and digging deep enough into each concept to allow the students to appreciate knowledge and apply it to life. In order to accomplish the latter purpose, I believe it is important to provide students the opportunity to discuss topics that affect their communities, their schools, and their homes. Discussion of any topic, especially where members of the class have different points of view, seems to draw out the passion in students and urges them to delve into the subject deeper than they would if it was just an assignment from the teacher. Daniels and Zemelman (2004) report that

mature readers use more than one source of information to make decisions. An educational setting that relies only on a textbook for information is training the students to look to one source for information for answers to many complicated problems. The textbook is the authority, and no other views are entertained. This is not the normal reading pattern of an adult learner. In order to promote interactive discussion between students, other sources of information must be available.

Promoting interactive discussion is not necessarily enough to encourage integration of science knowledge into the students' lives. Students must continually develop critical thinking skills which encourage them to analyze the information provided and apply their knowledge, not simply agree with information and memorize it. Critical thinking is a skill that is important to a student's ability to function in our society, as they are continually faced with the tasks of synthesizing great amounts of information and making decisions concerning that body of facts (Angeli, 2009; Halpern, 1998). Defined as "the use of those cognitive skills or strategies that increase the probability of a desirable outcome," (Halpern, 1998, p. 450) critical thinking is a topic frequently discussed among high school teachers as a skill they would like for their students to develop as they move toward further study or out into the world of work. Strategies and philosophy for developing critical thinking in students are abundant in research literature with many hypotheses concerning the best methods for teaching students to think with purpose and become goal-directed (Halpern, 1998).

Science classes, however, are not always conducted with the idea of improving critical thinking skills. Even though we do expect our students to commit to memory a certain body of facts, teachers must also understand that life outside the classroom is not a

memorization race. In a survey of scientists' views on science education, one of the concerns noted was the lack of opportunity to develop critical thinking skills and the fact that students learn to memorize, not understand (Taylor, Jones, Broadwell, & Oppewal, 2008). Students also tend to view science as a body of facts to memorize (Shodell, 1995). In the 1983 report *A Nation At Risk* one of the concerns for the future of our nation was that many high school students could not make inferences from written material. Students should be learning to think, to analyze, and to be self directed learners.

Many different methods can be employed with students to help them improve their critical thinking skills. One tool that allows interaction between students outside of the school setting and easily allows for the use of sources other than the textbook is an online discussion board. A teacher can easily set up a blog or a wiki which allows the students to read online articles, online texts, watch video clips, share links, and afterwards discuss the content of these items with their peers. Young people today are very comfortable and familiar with new communication technology, so the wiki or blog capitalizes on this interest to engage this generation of students (MacBride & Luehmann, 2008; Pape, 2010).

Numerous benefits have been realized through students' online discussions using wikis or blogs. Because the online source can be utilized outside of the school walls, learning can continue to take place after students leave the school (Downes, 2004; MacBride et al., 2008; McCarthy, Smith, & DeLuca, 2010; Pape, 2010). Students' lives tend to be a stream of constant motion from one class to another and then to activities after school, which gives them little time to reflect on the information covered in class.

When the student does sit down to complete his or her homework, reading the posts of other students can serve as reinforcement of the days' work (Pape, 2010). Reading online articles and other students' posts encourages the participants to make connections between their prior knowledge and their newly acquired knowledge (Matthew & Felvegi, 2009). Before writing a response to their peers' post, the student must understand what he or she has read, which requires reflection, questioning, and reacting (Downes, 2004). Comprehension of scientific texts and critical thinking skills can be monitored over time because of the continual written format (DeSouza-Hart, 2010). Online discussion can also help to engage students who are non-participatory. Redekopp and Bourbonniere (2009) found that when reluctant students were given an opportunity to blog anonymously they did make useful comments.

Several parameters must be explored in order to construct an environment conducive to discussion on a wiki or blog. There are issues of discussion group size, amount of instructor involvement, and how the discussion will be assessed. In addition to these topics, the instructor must also decide on what types of prompts to use.

Group size affects the number of posts for a topic, the dynamics within a group, and the quality of the posts. McCarthy et al. (2010) studied the differences in discussion posts between a large group of 20 graduate students and multiple small groups of 5 students. Although 100% of the students were positive about the use of discussion boards, 68% of the large group responded that hearing other people's responses was valuable, while only 25% of the multiple small groups agreed. A positive for the small group was that the individuals had no trouble generating unique comments, while in the

large group the posts sometimes were repetitive. Small groups may have lacked some depth to their discussions because of the availability of unused topics.

Instructor involvement is another factor which must be determined to create an effective discussion setting. A more "student-centered" blog environment was the goal of a math teacher who utilized an online setting for his students (MacBride et al., 2008). His message to his students was that

> "education doesn't just flow from teacher to student, that's not how learning takes place. It's not like pouring liquid from one cup to another; it doesn't flow in one direction. For students to learn they need to construct that knowledge for themselves" (MacBride et al., 2008, p. 173).

This teacher's goal was to encourage the students to think critically and collaborate with one another in order to reach a common goal – understanding the material.

Assessment must also be considered when assigning student work. In the case of online discussions, several characteristics of the posts can be monitored. Students can be required to make a specified number of posts by a certain date, the posts may be of a certain length (number of words), and the students may be required to demonstrate higher level thinking (DeSouza-Hart, 2010; McCarthy et al., 2010).

One last thought to consider is the students' attitudes toward the blog or wiki. As previously stated, graduate students in speech-language pathology who used a discussion board to aid in learning new technology all had something positive to say about the tool (McCarthy et al., 2010). When asked the question, "What if your blog was gone?" the students in a high school math class "repeatedly emphasized how it important it was for them to have the interpretations and explanations of their peers." (MacBride et al., 2008).

In two sections of an undergraduate language arts methods class, the comments about creating a wiki consistently reinforced the benefits of the tool. These students profited from exploring resources other than the text, making personal connections which aided in their everyday lives, and collaborating with their classmates (Matthew & Felvegi, 2009).

METHODOLOGY

Many different methods for discussion of current events in the environment can be employed in a high school science class. For this capstone project I examined how online discussions of environmental topics affected students' success. Because my students had already begun to use an online discussion forum before my project began, I did not compare students' discussions in class versus online. Instead I considered the type of question prompts in online discussion that would be most effective in encouraging their ability to integrate science principles into their everyday life. In addition to this question I also investigated which type of prompt encouraged more student participation, how the use of the discussion board affected the quality of responses over time, and with which prompts the students were most comfortable.

Two eleventh grade Advanced Placement Environmental Science (APES) classes, a total of 25 students, were involved in this study. Three of these students were exchange students from China, one male and two females. The remaining students were Americans of Caucasian descent, with a total of 15 females and 10 males. These students had reliable access to the Internet at home and were comfortable with the introduction of a wiki as a website to check homework assignments and find links to optional reading material. The research methodology for this project received an exemption by Montana

State University's Institutional Review Board and compliance for working with human subjects was maintained.

This project spanned nine weeks, from January 3, 2011, until March 11, 2011. The wiki was introduced to the students on the second day of school, passwords were distributed, and a test was performed to make certain all students could access the site from their home computers. Only two students had difficulties; within two weeks both issues were resolved by adjusting computer settings on their home computers.

The students were informed that the wiki's primary use would be to discuss environmental science topics, but the classwork and homework schedule would also be posted. In previous classes the current event assignments consisted of the student searching for a current event on a specific topic and writing a short summary of the event. In my estimation these assignments tended to be dry and uninteresting, and did not contain the discussion element I desired. My goal was to increase the interest in current events, and therefore the retention of the subject matter, by using the wiki as the discussion medium.

When the project began, the students were directed to check the wiki for directions concerning the current event prompts. General guidelines concerning all current events were posted on the first current event page of the wiki (Appendix A).

Current event prompts on the wiki discussion board were designed to coincide with topics studied in class in order to give the student some background knowledge about the environmental topic being discussed. Topics discussed online during this project were population, air quality, and two different prompts regarding energy. The format for each of the four assignments was unique, to enable a comparison between prompt types. In

the first prompt, population, a case study situation was used because I was curious to see how the students would react to working through this learning method online. This particular case study involved sea lions that lived on the Western coast of Alaska. The students were required to read three sections of this case study, one at a time, and answer the questions at the end of each short reading. They were also encouraged to ask questions of their classmates and post any websites they used to answer the questions (Appendix B).

Air quality, the second prompt, was a traditional question and answer task with emphasis on a local incident. Students were required to read five teacher chosen articles, then answer four questions about the articles. Another requirement was to make four reflective posts on other students' answers (Appendix C).

Energy 1, the third prompt, was adapted from an idea in the book, *Subjects Matter* (Daniels & Zemelman, 2004). This format was the most unique, in that the students were allowed to choose their roles, their audiences, the formats of their delivery, and the topics. This format is called RAFT. After posting their unique responses, the students were also required to post two reflective comments to other students' posts (Appendix D).

The energy 2 format, the fourth prompt, was also adapted from an idea from *Subjects Matter* (Daniels et al., 2004). Students read an article from the choices given, and then summarized the article using the words "I say… It says… And so…" (Daniels et al., 2004). In this format the students were given a choice of topic, but they were required to follow specific directions when making the post (Appendix E). Table 1 describes the four types of prompts, the topics, and the expectations for student responses.

Table 1
Description of the Four Discussion Prompts

Date/ Topic of Current Event/ Group Size	*Type of Prompt*	*Number of original posts/ Length required*	*Number of Additional Comments to Peers*
January 3 / Population / Groups of 6	Case Study Prompt-Sea Lions/ All students answered the same basic questions	Individual comments - 2 Group comment - 1	None
January 29 / Air Quality/ 5-6 students	Teacher chosen articles / Reflective comment based on teacher created questions	1 comment of 150 words	4 posts
February 18 / Energy I/ 5-6 students	Role-Audience-Format-Topic (RAFT)	1 comment of 150 words	2 posts
March 4 / Energy II/ 13 students	It Says/ I say / And So…/	1 comment	2 posts

Comments written on the discussion board served as a great information source to determine the student's success with the wiki. Students were required to make an initial comment to the question/questions or prompt given on the wiki. In three of the four prompts they were also required to comment on their peers' posts. Any posts made in addition to the required number were counted to determine which prompt encouraged more discussion between peers. The prompts also required online research to answer questions. The number of extra sources posted by students was tallied to indicate which prompts encouraged more research.

The quality of the wiki response was analyzed by several means; if the student chose to develop his/her comment by answering more questions than required; the student chose to add a website/other extra resource to the post because they were interested and

wanted to share it with the class; and /or the student asked an original question elicited from his/her understanding of the articles. These posts were counted to evaluate how the quality of responses on the wiki changed over time.

Surveys were completed by the students after the conclusion of the first two prompts and again after all four prompts were completed. These surveys provided a direct source of data from the students concerning their participation, quality of responses, integration of current events, and enjoyment of the discussion board (Appendix F and G).

One of the most important reasons for developing the discussion board was to observe the effects of discussion on the lifestyles of the students. Did they read about environmental science and then forget about it, or did they talk about the concepts with others? Were they aware of how to live sustainably and protect our environment? Did they care about environmental issues? To gather data concerning these issues, I used student interviews. The interviews were designed to allow the students to reflect on which type of prompt encouraged them to share information with others. This method of data collection involved selecting seven students from the class for the interview. Four girls and three boys were selected. For this interview I chose the male and female who commented most in class and the male and female who commented least in class. The other three students included two students who seemed most excited about the online discussion at its onset and one who was the least excited. The interviews were conducted at the end of the project period after all four of the prompts had been discussed online. Student interview questions can be found in Appendix H.

After each wiki assignment concluded, each student completed a student reflection (Appendix I). These reflections were analyzed for information regarding participation,

amount of research for each prompt, discussion with others about current events, and how well the student enjoyed answering each prompt. Table 2 summarizes the data collection strategies used in this study.

Table 2
Data Triangulation Matrix

Focus Questions			
Primary Question: What discussion prompts are useful in encouraging students to integrate science knowledge into their decision making processes?			
Secondary Questions:	Data Source 1	Data Source 2	Data Source 3
1. Which question prompts encourage more participation from students?	Quantitative measurements of the comments written on the wiki	Student interviews / reflections	Student survey
2. How does continued use of the discussion board affect the quality of student responses?	Student surveys	Student reflections	Qualitative measurements of the comments written on the wiki
3. Which question prompts encourage students to integrate principles in environmental science into their lives?	Student surveys	Student interviews	Student reflections
4. Which question prompts are the students more comfortable with?	Student surveys	Student interviews	Student reflections

DATA AND ANALYSIS

Current events are used frequently in science classrooms, particularly in dynamic fields such as environmental science. Past class assignments have required students to find environmentally related articles in their local newspaper, online, or in periodicals, read and analyze them, then give an oral report in class. I was not satisfied with the result of this type of current event assignment, as the integration of science and life in the real world never became exciting to my students. I longed for a better method! After taking "Web Tools for Science Teachers" this past summer, I found that creating a "wiki" for my AP Environmental class would allow the students to discuss these current events online. My hope was that using a contemporary approach with familiar technology would increase students' enthusiasm and retention of environmental topics.

The wiki allowed the students to post comments in a manner similar to the format of a discussion board. With each new unit in environmental science I posted a current event prompt that paralleled the topic being discussed in class. Even though my research focused on the assignment prompts and their affect on student success, I also wanted to discover if the students thought the use of the wiki discussion board was beneficial to their education.

After all of the current event prompts were completed, seven students were interviewed concerning their views on the wiki. In Question #2 (Appendix H) the students were asked their thoughts about using the wiki at the beginning of the project and how they felt about it now. Four of the students, or 57%, felt uncertain about the wiki in the beginning due to fears about the ease of use and the expectations of the work.

One of these students also stated in her reservations, “At first it was uncertain because you were worried about everyone looking at your answers.” Two of the seven students (28.5%) said they were excited to see how it worked, and one remarked, “At first I thought it was kind of like, just a hassle to get it all done because there was, like, multiple parts.” The announcement of the new method to present current events was off to a shaky start!

After completing the first two current events, all the students took a survey concerning their assessment of the wiki prompts. Questions one through four on the first student survey (Appendix F) show the results. A majority of the students felt comfortable with the wiki, felt it helped them understand environmental science topics, and saw the wiki as a good change from normal homework. Only three students (12%) showed some degree of trouble with the technical aspects of the wiki (Figure 1).

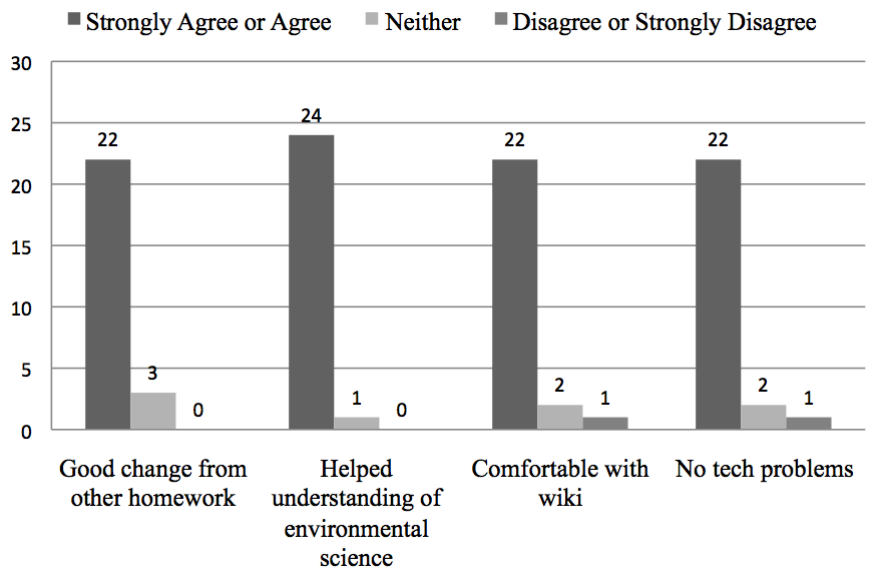


Figure 1. Student Survey Responses, Survey 1, Questions 1-4, (*N*=25).

In addition to their thoughts before using the wiki, interviewees also gave their reactions to the wiki after having completed all of the current event prompts. All seven students (100%) confirmed that after using the wiki they felt more comfortable with the prompts. The student who was concerned about her peers' reactions to her comments said, "then you get used to it and see that everyone is just trying to help you and you can learn from each other." Another student declared, "I really like it and I'm going to miss it."

The final evaluation for the effectiveness of the wiki was in the form of the second student survey (Appendix G). The questions remained the same as for the first survey, but the student responses in favor of the wiki were almost unanimous (Figure 2). The one student who seemed to have technical problems also commented about this in his/her final reflection, saying, "I liked the wiki, but I believe that it would be more beneficial if we discussed them in class instead of having to do it on the computer." This student went on to say that his/her weekly computer time was limited. This is definitely a drawback with using an assignment that is Internet based, but this challenge can be overcome with more access to computers during school hours. Another student's final remark about the wiki gave a different viewpoint; "I would encourage any future APES classes to request a wiki for their studies because overall I believe it helped me to understand environmental issues better than other systems of learning/homework."

There were small changes in the responses for questions one through four between the first survey and the second survey. When responding to the prompt, "Discussions on the wiki have been a good change from other homework activities," 12% neither agreed nor disagreed on the first survey, but on the second survey only 4% answered neither. There

were no responses that disagreed with that statement for either survey. I believe these changes can be explained by continued use of the wiki, as well as unique prompts that were enjoyable to complete.

The second question, "Discussions on the wiki have helped me to understand specific events in environmental science," elicited the same responses for the first and second surveys. I believe the students understood from the beginning that completing the current event assignments helped them broaden their understanding of the topics discussed. Both the third and fourth questions, "I am comfortable completing current event assignments on the wiki," and "I understand how the wiki works and usually have no technical problems with it," produced the same change in responses. Eight percent neither agreed nor disagreed with these statements in the first survey, but in survey two this percentage was zero. With both of these prompts 4% of the students who responded said that they disagreed with these statements. In the beginning of the project there were two students who had challenges with access to the wiki on their home computer. Both of these students had access to a family member's computer, and the site worked well on that computer. Unfortunately, the family member's computer was not as convenient, so these students were a little frustrated in the beginning. There was one student of the 25 who stated several times that he did not get on his computer but once a week, and when he did log in, he sometimes had technical difficulties. He also made it clear that he liked the wiki, but he would rather do the work in class.

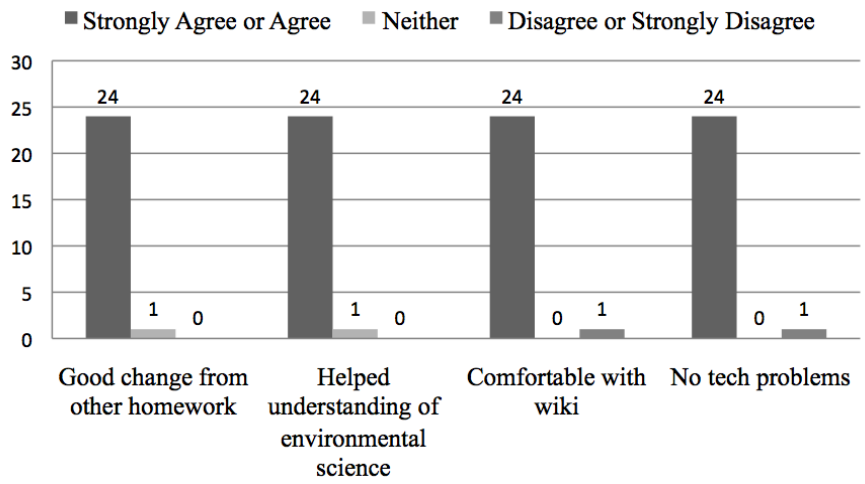


Figure 2. Student Survey Responses, Survey 2, Questions 1-4, (*N*=25).

Participation is one factor that is important in determining integration of science knowledge into students' decision making processes. In order to integrate, students must be engaged in active learning. If there is not adequate participation, then integration cannot occur. Student participation for each prompt type was measured using several approaches; student interviews, quantitative measurements of wiki comments, and student survey/reflections. During the interviews students were asked to identify the prompt that encouraged the most research. Of the seven students, one (14%) responded that the air quality prompt encouraged her to do extra research because "I never thought about it that much." The other six students (86%) chose the energy 1 prompt for various reasons. Since the format of the prompt required students to choose a specific role and audience, they were more attentive to the facts presented. For example, one student "looked up a couple, two or three articles, to put some extra facts into the letter I was writing" while another said "I wrote a speech for energy 1, so I should be responsible for the information I deliver to my audience. It forced me to look for sources and find the

most reliable ones." One student remarked "I took the opposite stand of what I really believe about wind energy. That required me to do more research."

The number of extra comments written on the wiki and the amount of extra research completed served as indicators of participation. Posted websites and comments over the required number were counted to assess participation for each prompt. Even though all four prompts elicited some extra comments and extra website posts, students posted more comments and websites when answering the energy 1 prompt (Figure 3).

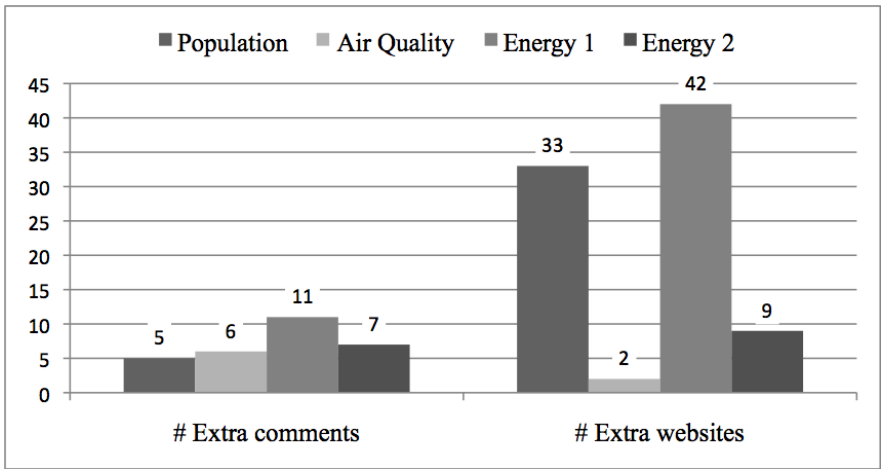


Figure 3. Optional Comments and Websites on the Wiki, (*N*=25).

Extra website posts were also significantly higher for the population prompt, which involved the sea lion saga. In the energy 1 prompt, 15 of the 25 students, or 60%, added the 42 extra websites, whereas in the population prompt 22 of the 25 students, or 88%, added the 33 extra websites. There were actually more students involved in posting websites in the population prompt, but they posted less total websites. There were 3 students (12%) who did not post any websites for the population prompt and 3 students who did not post any websites for the energy 1 prompt.

The student reflections give some insight about the reasons for the increased participation for the population and energy 1 prompts. One student commented, "I liked the format of this current event (energy 1) better because it promoted more small group discussion." Concerning the sea lion population prompt one student wrote "This encouraged me to do research since I was really intrigued by the sea lions and how they were being affected." Less website posting was evident in the air quality and energy 2 prompts, and some explanation was seen in the student reflections. One student wrote that the energy 2 prompt was "not as interesting" while another commented that "it was not as involved." Interviews also added to the reasons that there was less participation in two of the prompts. One student commented,

> I wasn't really big on the air pollution. It had a lot of articles, so I spent less time on each one and I just kind of read through them quickly – let's just post something and be done." This same student added later that she learned the least from the air quality prompt because "we had short choppy articles and didn't ask each other questions and didn't discuss it as much.

In the student surveys, the energy 1 prompt was found to encourage the most independent research, with a mean of 3.96 on the Likert scale. The sea lion (population) prompt was second in generating extra research, with a mean of 3.60. Energy 2 generated 3.40, and air quality 3.24 (Table 3).

Table 3
Student Survey Results – Extra Research

Survey Question	Mean	Standard Deviation
Completing the CE about populations (sea lions) encouraged me to do other research that I would not have done on my own.	3.60	1.00

Completing the CE about air quality encouraged me to do other research that I would not have done on my own.	3.24	1.05
Completing the CE about energy 1 (RAFT) encouraged me to do other research that I would not have done on my own.	3.96	.93
Completing the CE about energy 2 (It says/I say/And so) encouraged me to do other research that I would not have done on my own.	3.40	.95

In the final survey, in response to question number 7, 68% of the students chose energy 1 as the prompt that encouraged more research, 8% chose air quality and 12% each chose population and energy 2 (Table 4).

Table 4
Final Student Survey Results Question 7

Survey Question	Energy 1 (RAFT)	Air Quality	Populations (sea lions)	Energy 2 (It says/I say/ And so)
The assignment (type of prompt) that encouraged me to research more was	68%	8%	12%	12%

This research also focused on how continued use of the discussion board would affect the quality of student responses. Data collected indicates that the format of the prompt is the greatest contributor to the quality of responses. To evaluate responses on the wiki for quality, the number of questions asked of classmates was recorded, as well as any comments that contained analysis about the issue being discussed. Comments which were merely "Good job!" or "I liked your response" were not considered as quality responses.

Required responses as well as extra responses were evaluated in this inquiry. The number of websites posted was also considered as part of a quality response.

Both the air quality prompt and the energy 1 prompt evoked numerous questions and thoughtful comments. Students added 30 thoughtful comments and 30 questions of their classmates to the energy 1 discussion, as well as 42 extra websites. Even though the air quality discussion only generated 2 extra website postings, students did find the discussion worthy of 27 thoughtful comments and 25 questions to their classmates. The prompt that stimulated the least number of quality comments was the energy 2 prompt, with only 10 thoughtful comments, 8 questions, and 9 extra websites (Figure 4.)

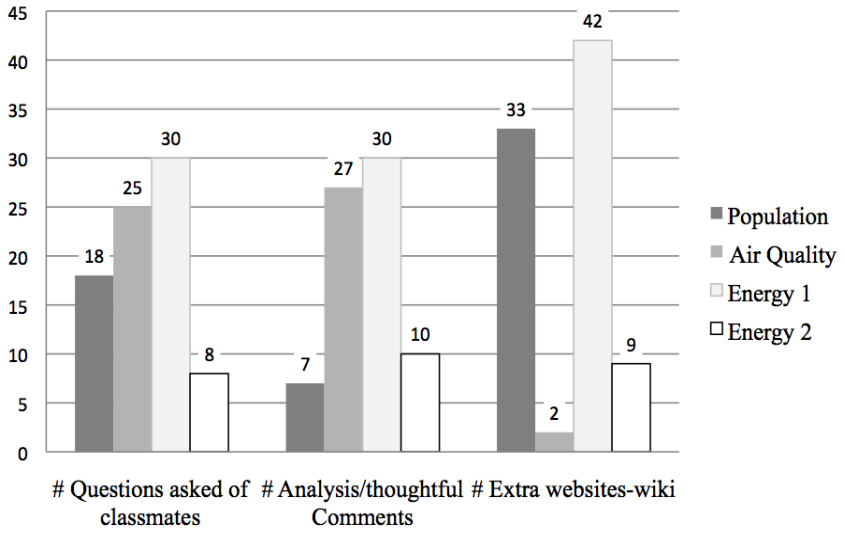


Figure 4. Quality of Comments on the Wiki, (*N*=25).

Student surveys concerning the number of extra websites mirrored the data gathered from the analysis of wiki responses. The population and energy 1 prompt were perceived

by the students in the surveys to encourage more research, which was confirmed by their responses on the wiki (Figure 5).

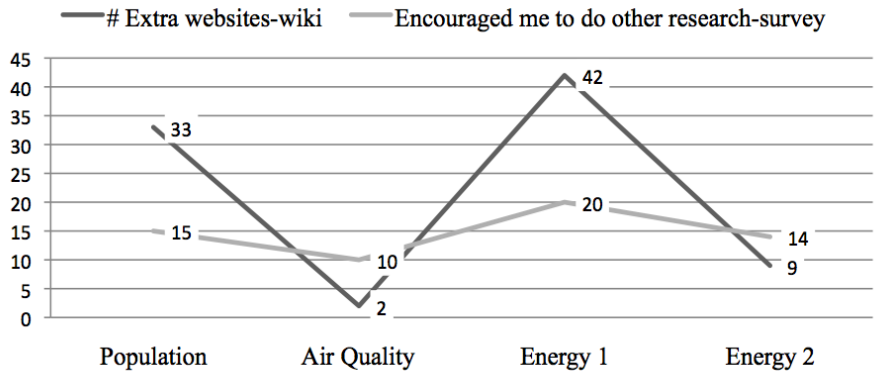


Figure 5. Relationship Between Wiki Responses and Student Surveys, (*N*=25).

According to the survey results, a majority of the students believed that all the prompts caused them to think carefully. When comparing these results to the actual responses on the wiki, the air quality and energy 1 prompts show that the students did give more thoughtful comments, but less so for the population and energy 2 responses (Figure 6).

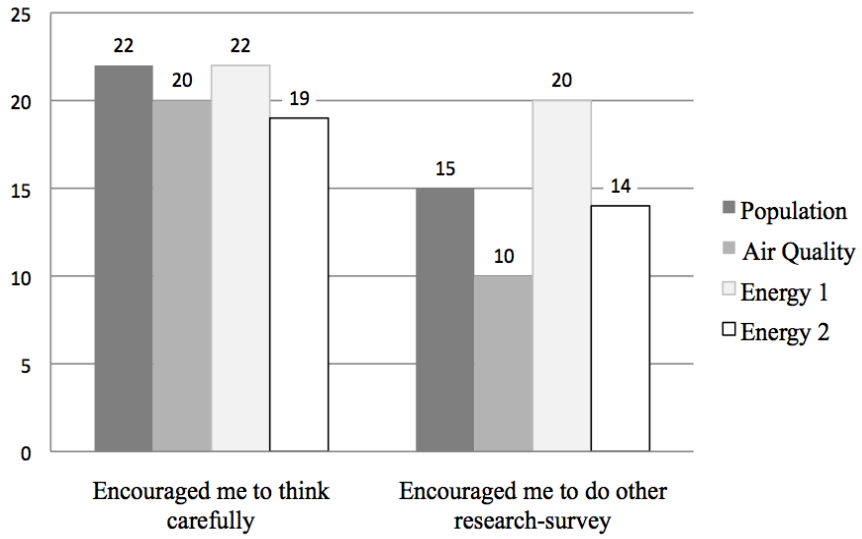


Figure 6. Student Survey of Responses to "Encouraged Me to Think Carefully" and "Encouraged Me to do Other Research", (*N*=25).

Student reflections gave insight to the responses for the student surveys. Eight of the 25 students (32%) remarked that the population (sea lion) prompt caused them to think deeply about the issues. One student wrote, "It was neat to be able to read about something that's going on and then try to figure out the cause." Another response recorded a similar feeling: "It allowed you to see population fluctuation in action as well as provoking serious thought into the reasons for the decline in the Western stock." From these comments one can infer that the students were thinking about the implications of the current event, but this thought process did not produce more comments and questions on the wiki. The fact that this current event was not a local occurrence, and therefore did not affect the students directly may have influenced the lack of comments and questions.

The reflections on air quality only generated unity in one area – the current event focused on a local incident. Seven of the 25 responses (28%) included some reference to this in their reflection, such as: "they (the event) were happening in our county or

somewhere very near to us" and "I really enjoyed this CE's focus on local issues." One student remarked that he realized the incident discussed was "only three miles away from my house." He also added: "You wouldn't think too much about issues like that unless they were in your own backyard." Because this current event focused on a local happening, the students became more aware of how air quality affects them personally. The discussion of air pollution suddenly moved from an event that happened in big cities to a challenge locally that could influence their lives.

Energy 1 reflections indicated the rationale behind the increase in comments, questions, and extra research. In the analysis of these reflections, several important themes were noted. Seven students (28%) commented on the necessity of finding websites. One student stated:

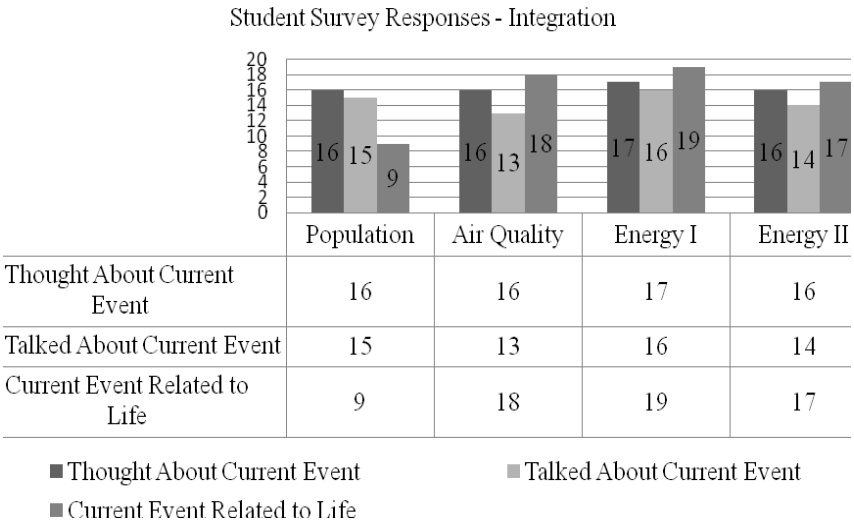
> I thought the topic of this current event and the format was an interesting change. I learned so much more having to get online and find my own websites dealing with my topic. This fact caused me to have to think about what I was doing and also consider which sites would be most helpful to my fellow classmates.

Another student added, "I also liked having to do extensive research." Some examples of the students' thoughts include, "I enjoyed writing the letter because I really had to become a taxpaying citizen and think about what I would have problems with" and "Not only choosing a side but also having to find facts to back up your opinion helped me to really learn about solar energy. It might have taken more time and effort but I think it was worth it." Some comments alluded to improving critical thinking skills: "Also, putting myself in the role as someone else really made me be open-minded to different opinions"

and, “I think that we were able to really put ourselves in other people’s perspective and see how this affects everyone!”

Three themes were analyzed when determining the integration of environmental science principles into a student’s life: thinking about the science topic while not working on the prompt; talking to someone about the wiki prompt; and the perception of whether the wiki prompt related to a student’s life. Students showed strong integration of environmental science themes into their everyday lives regardless of the prompt type.

Student surveys show that more than 50% of the students thought about each of the current event prompts even when they were not working on the assignment and the current event encouraged them to talk about their knowledge. For three of the current events – air quality, energy 1, and energy 2 - over 65% of students agreed that these current events related to their lives. Only 9 students (36%) agreed that the population current event related to their lives, probably because this case study event was not local (Figure 7).



	Population	Air Quality	Energy I	Energy II
Thought About Current Event	16	16	17	16
Talked About Current Event	15	13	16	14
Current Event Related to Life	9	18	19	17

Figure 7. Student Survey Responses to Questions Relating to Integration, (*N*=25).

Reflections and interviews, as well as teacher observations, also illustrated that a majority of the students integrated the current event information into their lives, regardless of the topic or format. When writing about the sea lion prompt, one student said, “This current event was helpful in making me more aware of the situations in the world that aren’t necessarily related to me.” Another student showed internalization of the issue when she wrote, “It was a great representation of how the growing human population is affecting the growth of the populations of other organisms.” These statements reveal an understanding that life is not all about what happens to these students locally. Student writing also reflected the amount of thought outside of class. One student wrote, “I found myself thinking about and applying the facts that I learned even after I had completed the assignment.” In the interview, when asked about talking to others about the prompts, one student responded, “Every topic I talked about with my parents and other people, especially with energy.”

Even though the students seem to have integrated all the topics into their lives, the prompts concerning energy topics led to more discussion outside of class. In the final questions in the student survey, 76% of students said that the energy topics applied most to their lives, with air quality at 24% and population 0%. The topic discussed most with others was also energy, followed by a tie for the population and air quality topics (Table 5).

Table 5
Final Student Survey Results Questions 2 and 3

Survey Question	Energy (both 1 and 2)	Air Quality	Population (sea lions)
The topic which applied the most to my life was	19	6	0
The topic that I talked about with others most was	16	4	4

Four of the seven students (57%) who were interviewed mentioned the energy topics as the ones they discussed with friends or family. One student, while researching his answer to energy 1, called a friend who lived in another state to obtain information. Those friends visited later in the semester, and they asked how the report went. One student mentioned that he had talked with his mom about the sea lion (population) current event, because "she majored in animal science. Yes, I got my family's opinion on all of them." Two other students spoke with their families about the air quality current event. One stated, "Especially because it was about the Stericycle plant and that is close to where I live." As far as talking to others was concerned, one student said, "I had no idea that this was going on which caused me to want to share with my family since it is happening right around us."

One other discovery from this research is that local news events stimulate more discussion among students and more perceived application to life than national events. The air quality prompt included three articles from our local newspaper, including two articles concerning an incinerator located in our county. One day in class after the air quality current event had been posted and discussed a student came into class very excited about a newspaper article. A follow-up article to the local air quality issue had been published and he read the article that morning. He was elated to remark, "I knew what they were talking about!" Linking what we read in our text to a current local issue shows that students are beginning to understand that environmental science issues are not just written in a textbook, they also affect our community. Students also showed personal involvement in the air quality issue. One student stated, "This also made me curious of how we can make a difference in our area" and another said it "made me want to do something to help." Students made seven comments in their reflections that revealed their interest in the local articles, referring to the event as being in "our own backyard," "pollution around us," "close to home," or "our back door steps."

Students were given the opportunity to choose the energy topic in which they were most interested to complete both energy prompts. Five of the energy articles dealt with issues in our state, which contributed to the student's feelings of applicability. Students expressed these thoughts with written comments such as, "I researched geothermal energy and found how neat this really was. It made me want to search and see if anywhere around here used this type of energy and I found out Elon University is starting to." This student included a link on her post to an article concerning the building of a

dorm using geothermal energy. Another student commented, “It was cool to learn about how solar energy in particular is used in our area.”

The student surveys showed that air quality, energy 1 and energy 2 ranked high in relating to the student’s lives (Figure 8).

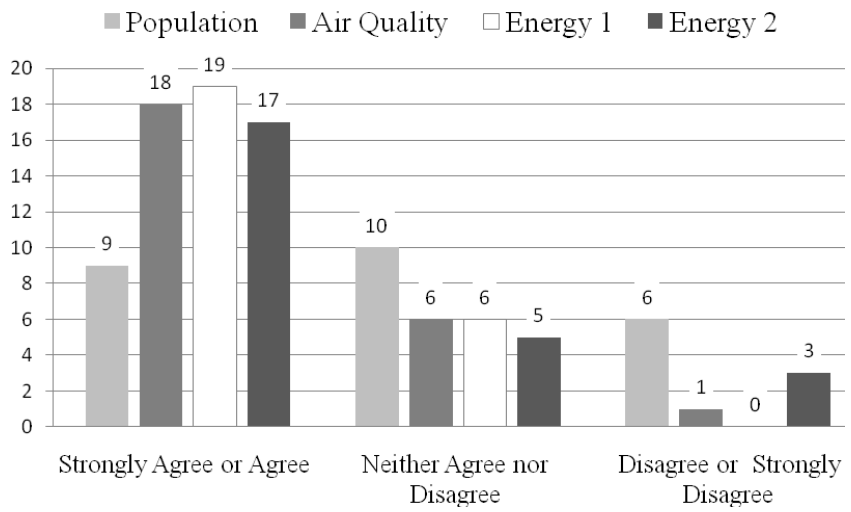


Figure 8. Student Survey Responses to the Statement, This Current Event “Relates to My Life”, (*N*=25).

The final survey included a statement that asked which of the topics applied most to the students’ lives. Nineteen of the students (76%) chose the energy topic; while 6 (24%) chose air quality and none chose the population topic (Table 6). Energy 1 and energy 2 were rated together for this part of the survey, since the topic was the same. Both energy and air quality prompts used local articles; however, only one student linked the energy prompts to the local area. Therefore, there must be other reasons for the link between application and energy for the students.

Table 6
Final Student Survey Results Question 2

Survey Question	Energy (both 1 and 2)	Air Quality	Population (sea lions)
The topic which applied the most to my life was	19	6	0

The student's degree of comfort when completing the wiki assignments affected their willingness to become engaged in the activity. Comfort level was measured using student interviews, reflections, and surveys. In the interviews and surveys, questions were specific regarding which prompt they liked or enjoyed most and least. Student reflections were examined for words which would indicate comfort, such as like, loved, interest, understand, flexible, fun, enjoyable.

All four prompts showed strong interest level from students. According to the student surveys, over 75% of the students agreed that all prompts were interesting while only one disagreed for air quality and one for energy 2. There were also higher numbers of students for air quality that neither agreed nor disagreed (Figure 9). This could be due to the fact that during this current event many students were absent. Students who were absent made up the current event postings after returning to school, but took the survey before finishing the online assignment. Because of this situation they may not have had enough information to make a choice.

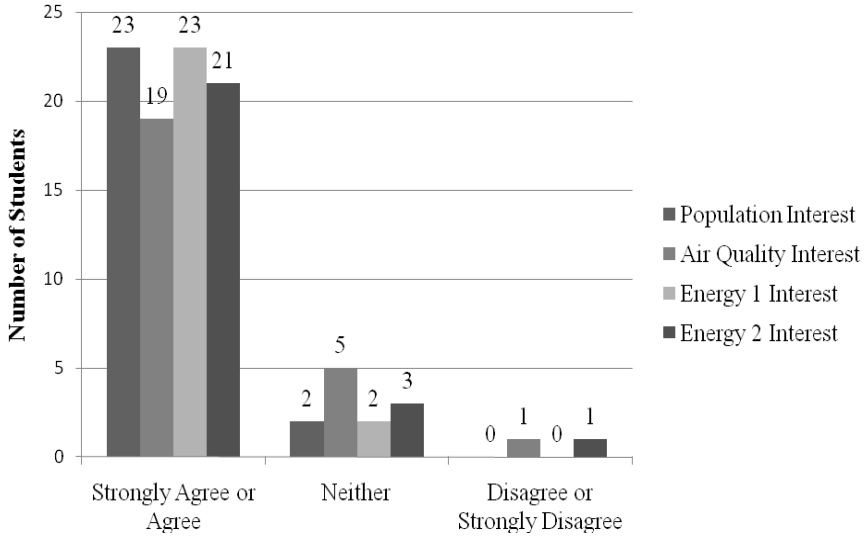


Figure 9. Student Survey Responses to the Statement, This Current Event Was "interesting", (*N*=25).

Student reflections reiterated the high interest level of all prompts. The reflections for the population prompt recorded 19 instances (76%) of the word "interesting," while the air quality prompt received 18 (72%), energy 1 recorded 23 (92%), and energy 2 had 16 (64%) (Figure 10). In explaining why the population prompt was interesting, one student commented, "The sea lion current event was interesting, and it applied well to our study of the population, and the reasons why a population can grow in one area and decrease in another." Another student commented on the energy 2 prompt; "I think this was very interesting, because learning alternate sources of energy is something new and exciting." Another student gave a different viewpoint about energy 2, remarking that, "It was good, but compared to the previous ones, this one is not as interesting. (But still very helpful and probably more practical)."

The ability to choose either the format or topic was important to the students, as 8 students referred to being “flexible” or “creative” in energy 1. One student wrote, “Being able to choose between topics really helps change up the pace, as well as allows us to learn.” For the energy 1 prompt, a student wrote, “I did like this format because it allowed us to do what we were good at or comfortable with. (people being creative.)” And another said, “I really liked the format of this current event. It was very fun to write about, and very flexible, and free as to what you could write.”

The word “enjoyable” was used 3 times for populations, 4 times for air quality, 9 for energy 1, and 5 for energy 2. Some thoughts from the students were, “I really enjoyed the energy current event, and learned quite a bit about wind energy” and “I enjoyed this current event because I had the chance to put myself in a certain role and voice my opinion on certain matters.”

The words “like” or “loved” were used to describe the energy 1 prompt 13 times, while the energy 2 prompt received 2 responses of “like” and 3 of “don’t like.” One student stated her viewpoint in a reflection, saying, “I totally loved this current event. The fact that it had several parts really let it sink in so that I could understand the material more.” Clearly the energy 1 prompt was the favorite, but all prompts generated favorable responses from the students. One student summed this up in a reflection comment, saying, “The more current events I did, the more I grew to love them.”

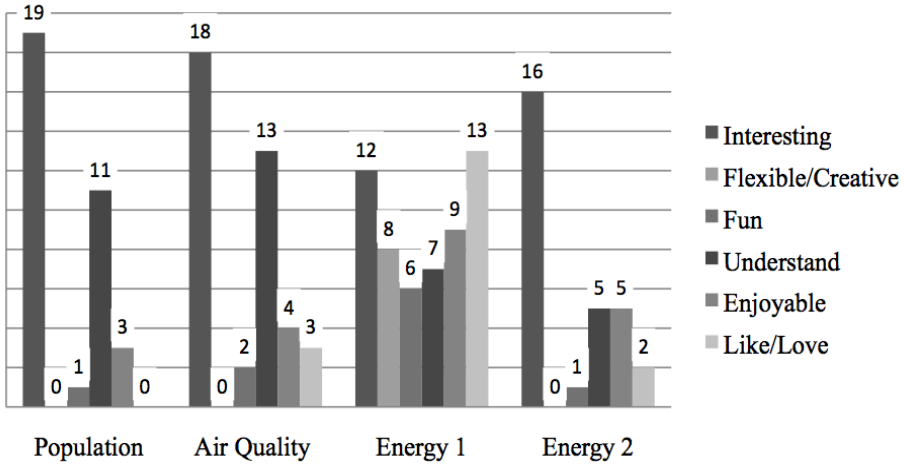


Figure 10. Student Reflection Responses Showing Words Associated With Comfort Level, (*N*=25).

As stated previously, the energy 1 prompt was the favorite of the students. In student survey 2, question number 5 asks what type of prompt the student liked best. Seventeen students (68%) responded that the energy 1 prompt was their favorite. Four students, or 16%, liked the energy 2 prompt the best, with 3 students (12%) for the population prompt and 1 (4%) for the air quality prompt (Table 7).

Table 7
Final Student Survey Results Question 5

Survey Question	Energy 1 (RAFT)	Air Quality	Populations (sea lions)	Energy 2 (It says/I say/ And so)
The assignment (type of prompt) I liked the best was	17	1	3	4

The reflections from students about energy 1 produced a greater number of positive comments, and the comments were also more diverse. One student appreciated the options in this current event, and wrote, "I enjoyed the way we could choose from several

different categories. This allowed much variety within the CE. This variety contributed to the overall "enjoyability" of the CE." Another student valued the ability to be creative, writing that "This one specifically let me be really creative in the way I was able to answer it, which was fun." This student chose to do a video commercial for her post, which was very unique. Another student commented that this current event had a "higher level of creativity, and I enjoyed that." Also, "I thought the idea of being able to choose our topic and role playing was really awesome" and "it was neat to write from someone else's point of view in a different medium. (I chose a speech, but I'm sure the other options were just as entertaining.)" The ability to choose how the students would create posts for this prompt produced excitement among the students, which led to increased participation and more research.

INTERPRETATION AND CONCLUSION

The use of a wiki as a discussion board for current events was an extremely successful undertaking for these AP environmental science students. Initially some students were uncertain about the work load and the website access, but after the first prompt the majority of students began to see benefits from online discussions. Just as Redekopp and Bourbonniere (2009) reported that reluctant students blogged useful comments, this research showed that students who would not volunteer information in class were comfortable posting their thoughts to the wiki. Students gleaned much knowledge from reading their peers' comments and some expressed sadness when the wiki work was completed. This was similar to the viewpoints expressed by students using a blog in the

math class examined by DeSouza-Hart (2010). Student interviews and reflections verify the positive influence of the discussion board on their knowledge base.

This research provides evidence that the discussion of current events through an online tool has a positive effect on the integration of science knowledge into students' lives. Being involved in discussion with classmates online initiated conversations with friends and family involving environmental science topics. Exposure to local current events generated a thought process that continued in the student after the assignments were completed. Furthermore, students made connections between the textbook and real life events that enriched their understanding of environmental science.

The format and topic of the prompts influenced the amount of internalization for the students, as well as impacted the amount of self directed research the students were willing to initiate. When the student had some control over their topic and format, their participation and quality of posts increased; they asked more questions of one another and also generated more quality responses. Length of time using the discussion board was not found to affect the quality of responses in a positive manner.

Each prompt elicited some positive participation due to its uniqueness. In the population prompts involving the sea lion case study, students enjoyed the challenge of deducing the answers from the data given. Overall, the students liked the mystery of this type of prompt, but the location did not have the local appeal of other prompts. The second prompt, air quality was a traditional question and answer task, with emphasis on a local incident. Some students enjoyed this prompt because it was a traditional question and answer, but others did not care for it for the same reason. Because some of the articles were local to our county, the students could relate to the issues. The research

indicated that the third prompt, energy 1, allowed more choice and creativity on the student's part, and therefore there was more participation. It is interesting for me to note that after adapting the concept I almost did not use it because I thought the students would absolutely detest it. Quite the contrary! I am so glad I used it, because it was the favorite format of most of the students. The last prompt, energy 2, was straightforward and required no self directed research. The students had to read an article from the choices given, and then summarize the article using the words "I say… It says… And so…" (Daniels & Zemelman, 2004). I really thought the students would like this prompt because of its simplicity. Again I was surprised! Several students struggled with this prompt, and three even remarked that they did not like it at all.

The implementation of unique formats for discussion reinforced the fact that students have many learning styles. This research supports the use of a variety of prompts during online discussions in order to encourage all students to integrate science knowledge into their lives.

VALUE

Online discussion through a classroom wiki provided an innovative medium for students to discuss current events. There were many positive outcomes which I would like to continue to support in my classroom. Increased discussion outside the classroom led to more awareness of the impact of environmental events in the students' lives. Students also discussed the topics with their parents which allowed the parents to have some input into the students' lives, and gave the parents a glimpse of what the students

were studying. Submitting assignments online reduced paper usage, contributing to the goal of sustainability we discussed in the class. The project allowed students to submit work at a time that was convenient for them, and created a central location to verify classroom assignments and discover links to supplementary information. One benefit that the students brought to my attention was that they learned from reading their peers' answers. I realized that I could compare the students' work when they turned in other assignments, but most of the time students don't have the opportunity to read other students' responses. This concept surprised me, and I believe it helps build a strong case encouraging the continued use of the wiki

Teachers of science, as well as in other areas, can build upon the discussion board idea, customizing the assignment requirements to fit the needs of their classroom. Many wiki sites are free to use and easy to set up. The positive results in this study are partly due to the attitudes of the students who participated and the fact that most of them had reliable internet service. Other researchers may see different results based on the type of students they teach and the students' access to an Internet connection.

The conclusions from this research indicate that the use of a wiki increased the integration of current events into the students' lives. However, there are several issues with the wiki that I would like to address before introducing the wiki to next year's class. First of all, I would like to see more spontaneous discussion between the students. Students suggested that when a reasonable question is asked of a student on the discussion board, that student should be required to attempt to answer the question. This written exchange may encourage more participation for all students involved.

Secondly, I would like to experiment with the time span of the assignments to see how a shorter time would affect the amount of shared ideas. Some of the assignments used in this project spanned a two or three week time period. Using a shorter time period for posting, with the requirement of posting a first comment early in the week, may increase the number of responses to a given prompt.

Lastly, I learned that variety in the current event prompts kept the students interested. Even though there were some topics and/or prompt types that the students did not appreciate overall, each prompt was unique and contributed to the knowledge base of the student in a distinctive manner. My plan for next year's wiki would involve developing additional formats for prompts, as well as using some local, regional, and international stories.

This project injected some enthusiasm and curiosity into the AP Environmental Science class, and therefore made the class more fun to teach this year. I enjoy experimenting with new methods of teaching, and I appreciate the use of digital communication, so the classroom wiki and discussion board was a refreshing change for current event discussions.

After using the discussion boards for the MSSE classes I realized how much I personally learned from the other students. I am a student who would be very withdrawn in class, and yet I could ask a question on the discussion board and not feel awkward. I realized that other students sometimes had the same questions. Another positive aspect of the discussion boards is the convenience in submitting assignments online. Because of this experience I thought that a discussion board might accomplish some of the same goals with my students, and it did! I am still amazed that many of them enjoyed working

on the wiki as I did and they saw the benefits that I saw from the interaction between peers. The increased participation from otherwise quiet students, the improvement of communication between class members, and the convenience of submitting an assignment from home were positive comments mentioned by the students during the project time frame.

There are several impacts I hope to see due to this capstone project. First of all, I hope to see higher AP test grades because of continued exposure to current events. Secondly, as long as the Internet is accessible, I will continue to use it to increase student centered learning. The Internet can be a great teaching tool, as I have experienced both personally and through this class. This project has motivated me to continue to improve my skills using online tools and to use them to benefit students. Lastly, I hope that this project has persuaded students to be more environmentally conscious because of heightened awareness from reading current events. In the world these students will inherit, knowledge of environmental issues will always be relevant to their lives.

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APPENDICES

APPENDIX A

GENERAL POSTING GUIDELINES

Appendix A
General Posting Guidelines

1. Each current event prompt is different. Please read the directions carefully and refer back to them as you work on your posts.
2. When posting make certain that you have evidence from a reliable source to back up your claims. Post the source also.
3. Remember that your post should be original. If someone else has posted your idea, you may explain that, but then you should post another thought too.
4. It is fine to disagree, but please use your words carefully. What is online is posted for the whole world to see – kind of hard to "take it back" once it is posted.
5. The requirements are the minimum. You are encouraged to post more often, use more sources, and ask questions of your classmates. This is your discussion, so take advantage of it!

APPENDIX B

CURRENT EVENT PROMPT #1 POPULATION

Appendix B
Current Event Prompt #1 Population

Instructions:

1. For this current event you will be grouped into teams of 5 or 6 students each. Each team will have a separate page for their comments. Here are the groups, along with a link to each team's page:

   Team 1: 5 students names
   Team 2: 5 students names
   Team 3: 5 students names
   Team 4: 5 students names
   Team 5: 6 students names

2. This current event will have three different parts, and therefore there will be THREE DIFFERENT DEADLINES for comments. Be sure to check the dates so that you will know when your comments are due.

3. PART I: Read Part I - Mystery in Alaska: Why Have All the Sea Lions Gone: West vs. East here. Post a comment on your team page about this reading. The comment should include:
   a. Answers to the two questions at the end of the reading.
   b. Any websites you used to understand the problem about the sea lions.
   c. Any questions you have for your teammates.

This post should be made by Thursday, Jan. 6 at 11:59 pm.

Link to Reading - Sea Lions

4. PART II: Read Part II - Mystery in Alaska: Why Have All the Sea Lions Gone: Pollock vs. Herring. Post a comment giving your input on the 4 questions asked at the end of the reading. As a group your team should come up with valid answers for all 4 questions. This will take some discussion between the team members, not just one post from each. Ask questions, make comments - discuss! By Monday, Jan. 17 at 11:59 PM each team should post their final answers to the 4 questions. This is my suggestion- the first person listed in the group takes the first question, second person the second question, and so on. The 4th question is a little harder, so the last two can work on it. You can all post your answers on your page, (instead of in the comment section) then each one can edit the other's work if you want to. That way the answers are a group effort, but one person has made the largest contribution to just one question. If that doesn't make sense, ask me in class. Have fun!
5. PART III: Read Part III - Mystery in Alaska: Why Have All the Sea Lions Gone: Diet and Energy Requirements

Answer questions 1-3 in the comment section of your team's page. Please show all calculations, and offer complete explanations where necessary. Due on Monday, January 24 at 11:59 pm

APPENDIX C

CURRENT EVENT PROMPT #2 AIR QUALITY

Appendix C
Current Event Prompt #2 Air Quality

ASSIGNED: January 29, 2011

First Comment Due: Thursday, February 3rd (11:59 PM)

Second Comments Due: Saturday, February 5th

Third Comments Due: Tuesday, February 8th.

Instructions:

1. You will again be in groups for this current event, but you will not answer questions as a team.

2. Read the following articles about air pollution. The first article gives some background about air pollution. For articles #2-5, answer these questions:
    a. How does each article make you feel?
    b. Do you think the claims in the article are valid? Why or why not?
    c. What could be added to each article to improve the believability of the claims?
    d. Make sure to notice the origin of the article. Is it from a newspaper, blog, etc? Also, record the date it was published.

3. The post should be at least 150 words.

4. Post at least two thoughtful responses to classmate's posts by Saturday, February 5th at 11:59 PM (Classmates should be in your group!)

5. Post at least two thoughtful responses to classmate's posts by Tuesday, February 8th at 11:59 PM (Classmate should be in a different group!)

6. Links to articles:
    a. Article #1 - From the EPA - Basic Information about Air and Radiation- Read the whole page. Extra links are optional.
    b. Article #2- Kid's IQ Scores and Prenatal Pollution
    c. Article #3- Poultry and Air Pollution
    d. Article #4 and #5 (They concern the same information)- Stericycle Debate and Article - Council rejects Stericycle resolution.mht

APPENDIX D

CURRENT EVENT PROMPT #3 ENERGY 1

Appendix D
Current Event Prompt #3 Energy 1

Current Event #3 Energy 1

Directions: There are TWO PARTS to this CE, but THREE deadlines. Make sure to read ALL the directions. (Modified on 2/22/11 at 8:05)

UPDATE : PART I (writing) due Monday 2/28 at 11:59 PM
PART II (see below) due Thursday, 3/3 at 11:59 PM (change from Wednesday)
This Current Event is worth a TEST grade. Please work diligently on it and be creative. It WILL take some time and research on your part. The point value for each part of the assignment is listed beside the assignment. Answering the questions asked will NOT automatically give you a 100. Make sure you have researched well and add some creativity and original thoughts to your posts.

PART I: DUE Wednesday, Feb. 23 (20 points) AND Monday, Feb 28 (50 points). Choose one option from EACH group below (Role / Audience/ Format/ Topic.) Read the articles I have chosen listed under your topic. Read and cite AT LEAST two other articles (Science Daily is a GREAT resource, but you can also use other newspaper sources) from another source. In your writing, answer the questions found beside your topic to get started, then add information as you think is necessary. If you choose to do a brochure or advertisement, create it in a Word doc, then upload it to the page and add a link. If you need help with this, let me know. If you choose any of the other formats, you should write at least 150 words. I suggest you save your work in Word before typing it into the wiki. Post your work on the page that matches your topic. Your choice of Role / Audience/ Format/ Topic is due on WEDNESDAY, FEB 23rd. POST your name and choices on the main wiki page for Current Event #3. (BELOW- ON THIS PAGE!) The actual written work is due on MONDAY, FEB. 28. Post this work on the wiki page corresponding to the topic you chose.

Possible Topics-

1. Biofuel for cars - Articles - Tobacco used for biofuel.pdf Biodiesel pump-comes to Saxapahaw.pdf Plant turning chicken fat into alternative fuel.pdf
   Is biofuel a reasonable alternative to gas? Would it be less expensive? What can you use to make biofuel? Are there any drawbacks to using biofuels? Choose one of the roles to address an audience using one of the formats. Argue either for or against biofuels, and give factual support for your argument.

2. Electric Cars - Articles - Triangle proving ground for electric cars.pdf Charging electric car batteries Electric Cars Hold Greater
   Are electric cars (or hybrids) viable alternatives to gas cars? Would the electric car help reduce our carbon footprint? Are any drawbacks to using electric cars? Benefits? Choose one of the roles and address an audience

using one of the formats. Argue either form or against electric cars, and give factual support for your argument.

3. Nuclear Energy- Articles - Nuclear Plants Get Warmer Reaction Sustainable Nuclear Energy Moves Questioning Nuclear Power's
   Would you want a nuclear power plant in your backyard? Why or why not? Would you want the nuclear waste to be buried close to your house? Again, why or why not? Is nuclear power for electricity a viable alternative to oil and coal? Choose a side, one of the roles, audiences, and a format to declare your argument. Argue either for or against nuclear power and use factual support for your argument.

4. Wind Energy - Articles - Prospects Cool for Rules on Wind Better Turbine Spacing for Wind Farms How to Get Wind
   Would you want a windmill farm near your house? What are the drawbacks and benefits? Could wind energy replace the coal powered plants in North Carolina? Choose a side, a role, an audience, and a format to argue your position. Argue either for or against wind energy and use factual support for your argument.

5. Solar Energy- Articles - Solar showdown in California tortoises.pdf Solar Power in Ontario Engineers Give Solar Power a Boost
   Would you want a solar panels on your house? What are the drawbacks and benefits? Could solar energy replace the coal powered plants in North Carolina? Would you want solar panels in habitats that would threaten endangered species? Choose a side, a role, an audience, and a format to argue your position. Argue either for or against solar energy and use factual support for your argument.

Role-

1. Taxpayer
2. A protector of endangered species
3. Senator of the US
4. President of an Oil Company
5. Head of the EPA
6. A homeowner living in the neighborhood with the landfill / nuclear power plant / windmills / solar panels
7. CEO of the company that produces electric charger stations
8. A farmer

Audience-

1. A US Senator
2. The American public
3. Wildlife / Environmental Activist

Format

1. Personal letter

2. Letter to Editor
3. Brochure
4. Advertisement
5. Speech
6. News Article (you are the reporter)

PART II: DUE Wednesday, March 2. (30 points) Choose two of your classmates' "creations" to read. Choose one that used the same topic you used (if possible) and one that used a different topic. Comment on each classmate's work, specifically answering these questions:

1. What was most interesting about the classmate's post?
2. Was there anything in their post you didn't understand? If so, ask the classmate that question.
3. Was there anything in their post with which you disagreed? If so, post a logical comment using FACTS which supports your side of the argument.

APPENDIX E

CURRENT EVENT PROMPT #4 ENERGY 2

Appendix E
Current Event Prompt #4 Energy 2

Current Event #4 – Energy

This is it – Your last CE of the year- ENJOY!

Directions:

PART ONE: Due Tuesday, March 8 at 11:59 PM
Below are links to three articles. You may read all three (I think they are interesting- of course, I would say that – HA!) CHOOSE ONE ARTICLE on which to comment. Here are the instructions for commenting:

1. Read the article carefully.

2. Answer TWO of the FOUR questions below about your article, using the following format:
    1. It says – In your own words state what the article says is the answer to your question. (one or two sentences)
    2. I say - What is your understanding of the answer based on what the articles says. (one or two sentences)
    3. And so- Your conclusion based on what it (the article) says and how you interpret it (one or two sentences)
    4. If you wish, add personal commentary/ website to add extra info (this is optional)
3. Questions:
    1. Why don't we use solar / wind / geothermal power for all our electricity needs? (Choose the type power your article discusses)
    2. Should we (the US) restrict solar/wind/geothermal power expansion when the environment/habitat/biodiversity/endangered species are threatened?
    3. Is there a drawback for using solar/wind/geothermal power?
    4. Is there a benefit to using solar/wind/geothermal power?

4. Where to post - Just to keep the posts less confusing, lets divide into two groups for posting.
    1. Those with last names beginning A-F, post HERE
    2. Those with last names beginning G-Z, post HERE
    3.

Keep your answers fairly brief – no need to expound on all benefits/drawbacks, etc, just one or two, but be specific! No "it's green" or "it's not green!"

PART TWO: Due Wednesday, March 9 at 11:59 PM
Make comments on any two of your classmates' posts. In each comment, ask your classmate a question about something they posted.

Article #1: Solar Farm in Davidson County
http://www2.journalnow.com/business/2011/feb/06/wssunbiz01-solar-farm-in-davidson-county-feeds-pow-ar-755849/

Article #2: Wind Turbines and Save the Grouse!
http://money.cnn.com/2009/08/03/news/economy/windpower_vs_wildlife.reut/index.htm

Article #3: Geothermal Energy
http://www.msnbc.msn.com/id/36000857/ns/us_news-environment/

APPENDIX F
STUDENT SURVEY #1

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Appendix F
Student Survey #1

Student Survey #1 – Wiki Discussions #1 and #2

In taking this survey, consider the last two current event (CE) discussions posted on the wiki. The first CE (populations – Stellar Sea Lions) asked you to read a case study in 3 sections, then answer questions based on the case study and scientific data that related to that study. The second CE (air quality) asked you to read five articles then comment on them by answering four questions posted. Read each statement about these current events carefully, then choose the column which matches your feeling about the statement.

Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. Discussions on the wiki have been a good change from other homework activities.					
2. Discussions on the wiki have helped me to understand specific events in environmental science.					
3. I am comfortable completing current event assignments on the wiki.					
4. I understand how the wiki works and usually have no technical problems with it.					
5. The articles in the **populations** (Stellar Sea Lions) current event were interesting.					
6. The articles in the **air**					

quality current event were interesting.					
7. The assignment for the **populations** CE helped me understand current **populations** issues better.					
8. The assignment for the **air quality** CE helped me understand **air quality** issues better.					
9. The case study CE about **populations** issues helped me understand **populations** better.					
10. I would prefer exploring current events as a homework assignment for class rather than as a discussion on the wiki.					
11. Knowing I had to post a comment for my peers to read about **Stellar Sea Lions (population)** encouraged me to think carefully about what I would write.					
12. Completing the CE about **populations** encouraged me to do other research that I would not have done on my own.					
13. Discussions on the wiki have **NOT** helped me to					

understand environmental current events.					
14. Completing the CE about **populations** encouraged me to talk to someone outside of APES class about **Stellar Sea Lions.**					
15. After completing the CE about **populations** I wanted to tell my friends and family what I had learned.					
16. The articles in the **populations** current event were **NOT** interesting.					
17. The instructions for the **populations** CE were easy to understand					
18. The assignment for the **populations** CE did **NOT** help me understand population issues better.					
19. The **populations** CE related to my life.					
20. After reading the CE about **populations**, I thought about the content even when I wasn't specifically working on the assignment.					
21. Discussing the **populations** CE with a small group was helpful					

to my understanding of the topic.					
22. Discussing the **populations** CE with the whole class would have been helpful.					
23. The discussion about **populations** did **NOT** relate to my life.					
24. Reading my classmates'comments about **air quality** issues helped me understand **air quality** better.					
25. Knowing I had to post a comment for my peers to read about **air quality** encouraged me to think carefully about what I would write.					
26. Completing the CE about **air quality** encouraged me to do other research that I would not have done on my own.					
27. The articles in the **air quality** current event were **NOT** interesting.					
28. Completing the CE about **air quality** encouraged me to talk to someone outside of APES class about **air quality in our area.**					
29. After completing the CE about **air quality** I wanted to tell my					

friends and family what I had learned.					
30. The instructions for the **air quality** CE were easy to understand.					
31. The assignment for the **air quality** CE did **not** help me understand current **air quality** issues better.					
32. The **air quality** CE related to my life.					
33. After reading the CE about **air quality**, I thought about the content even when I wasn't specifically working on the assignment.					
34. Being able to discuss the **air quality** CE with a small group was helpful to my understanding of the topic.					
35. The instructions for the **air quality** CE were **NOT** easy to understand					
36. Discussing the **air quality** CE with the whole class would have been helpful.					
37. The discussion about **air quality** did **NOT** relate to my life.					
38. In terms of the					

<u>prompts</u> used for the CEs- **NOT** the topics**:** I preferred the case study assignment **(populations-Stellar Sea Lions**) more than the question/answer CE (**air quality**)					
39. In terms of the <u>prompts</u> used for the CEs- **NOT** the topics**:** I preferred the question/answer CE (**air quality**) more than the case study CE (**populations-Stellar Sea Lions**)					

APPENDIX G

STUDENT SURVEY #2

Appendix G
Student Survey #2

Student Survey #2 – Wiki Discussions #3 and #4

In taking this survey, consider the last two current event (CE) discussions posted on the wiki. The first CE (energy I) asked you to choose an energy topic, then read two to four articles about that energy source. After reading those articles, you were to choose a roll, an audience, a format, and a topic from the choices listed. You also found two more articles about this topic and posted answers to the questions using the RAFT format. The second CE (energy II) asked you to read one article from the three choices, then answer questions from that article using the "It says, I say, And so" format. Read each statement about these current events carefully, and then choose the column which matches your feeling about the statement.

Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. Discussions on the wiki have been a good change from other homework activities.					
2. Discussions on the wiki have helped me to understand specific events in environmental science.					
3. I am comfortable completing current event assignments on the wiki.					
4. I understand how the wiki works and usually have no technical problems with it.					
5. The articles in the					

energy I (RAFT) current event were interesting.					
6. The articles in the **energy II (It says/I say/And so)** current event were **NOT** interesting.					
7. The assignments for the **energy I (RAFT)** CE helped me understand energy issues better.					
8. The assignment for the **energy II (It says/I say/And so)** CE helped me understand **energy** issues better.					
9. Knowing I had to post a comment for my peers to read about **energy I (RAFT)** encouraged me to think carefully about what I would write.					
10. I would prefer exploring current events as a homework assignment for class rather than as a discussion on the wiki.					
11. Completing the CE about **energy I (RAFT)** encouraged me to do other research that I would not have done on my own.					
12. Completing the CE about **energy I (RAFT)** encouraged me to talk to someone outside of APES class about					

energy use.					
13. Discussions on the wiki have **NOT** helped me to understand environmental current events.					
14. After completing the CE about **energy I (RAFT)** I wanted to tell my friends and family what I had learned.					
15. The instructions for the **energy I (RAFT)** CE were easy to understand					
16. The articles in the **energy I (RAFT)** current event were **NOT** interesting.					
17. The **energy I (RAFT)** CE related to my life.					
18. After reading the CE about **energy I (RAFT)**, I thought about the content even when I wasn't specifically working on the assignment.					
19. Being able to choose a roll, audience, format, and topic for **energy I (RAFT)** made this assignment more fun than the other current event assignments.					
20. Being able to choose a roll, audience, format, and topic for **energy I**					

(RAFT) made this assignment harder than the other current event assignments.					
21. The discussion about **energy I (RAFT)** did **NOT** relate to my life.					
22. Completing the It says / I say/And so assignment about **energy II (It says/I say/And so)** helped me understand energy issues better.					
23. Knowing I had to post a comment for my peers to read about **energy II (It says/I say/And so)** encouraged me to think carefully about what I would write.					
24. Completing the CE about **energy II (It says/I say/And so)** encouraged me to do other research that I would not have done on my own.					
25. The discussion about **energy II (It says/I say/And so)** did **NOT** relate to my life.					
26. Completing the CE about **energy II (It says/I say/And so)** encouraged me to talk to someone outside of APES class about energy issues.					

27. After completing the CE about **energy II (It says/I say/And so)** I wanted to tell my friends and family what I had learned.					
28. The instructions for the **energy II (It says/I say/And so)** CE were easy to understand.					
29. The **energy II (It says/I say/And so)** CE related to my life.					
30. The articles in the **energy II (It says/I say/And so)** current event were **NOT** interesting.					
31. After reading the CE about **energy II (It says/I say/And so)**, I thought about the content even when I wasn't specifically working on the assignment.					
32. Reading an article carefully and restating the main idea in the **"It says/ I say/ And so"** format was helpful to my understanding of energy issues.					
33. Discussing the **energy II** articles in a different format would have been more helpful than the **"It says/ I say/ And so"** format.					

34. The instructions for the **energy II (It says/I say/And so)** CE were **NOT** easy to understand.					
35. In terms of the <u>prompts</u> used for the CEs- **NOT** the topics**:** I preferred the **It says / I say/ And so…** assignment CE (**energy II)** more than the **energy I (RAFT)** assignment.					
36. In terms of the <u>prompts</u> used for the CEs- **NOT** the topics**:** I preferred the **energy I (RAFT)** assignment more than the **It says / I say/ And so…** assignment CE (**energy II.**					

Think about the four different types of current event assignments you completed, and then answer the following questions:

1. The most interesting topic in the assignments was
    a. Air quality
    b. Energy
    c. Populations

2. The topic which applied the most to my life was
    a. Energy
    b. Air quality
    c. Populations

3. The topic that I talked about with others most was
    a. Populations
    b. Air quality
    c. Energy

4. The topic that I wanted to find out more about was
    a. Energy
    b. Air quality
    c. Populations

5. The assignment (type of prompt) I liked the best was
    a. Energy I (RAFT)
    b. Air quality
    c. Populations
    d. Energy II (It says/I say/ And so)

6. The assignment (type of prompt) that was hardest to complete was
    a. Energy I (RAFT)
    b. Air quality
    c. Populations
    d. Energy II (It says/I say/ And so)

7. The assignment (type of prompt) that encouraged me to research more was
    a. Energy I (RAFT)
    b. Air quality
    c. Populations
    d. Energy II (It says/I say/ And so)

8. The assignment (type of prompt) that took the most time to complete was
    a. Energy I (RAFT)
    b. Air quality
    c. Populations
    d. Energy II (It says/I say/ And so)

APPENDIX H

STUDENT INTERVIEW QUESTIONS

Appendix H
Student Interview Questions

I will be recording our conversation so that I can accurately assess your responses to our interview. Do I have your permission to begin recording?

Questions:

1. During this semester our class has used the wiki to discuss current events online. Describe to me how you feel about using the wiki as a discussion board.

2. Describe how you felt about the wiki when we first began using it and how you feel about it now.
3. Describe how you feel about reading your classmates' posts and commenting on them.

Here is a handout listing the four prompts we used during our online discussions. Think about each of the prompts as you answer these questions.

4. Did any of these prompts encourage you to share environmental science information with others – family or friends?
    a. If there was a prompt that encouraged you to share with others, which prompt was it?

5. Which of these prompts did you enjoy answering the most?
    a. Why?

6. Which of these prompts did you enjoy answering the least?
    a. Why?

7. Which of these prompts encouraged you to do extra research in order to make a comment?
    a. Why?

8. Which of these prompts caused you to work the hardest to find the answers?
    a. Why?

9. From which of these discussions did you learn the most?
    a. Why do you think that is true?

10. From which of these discussions did you learn the least?
    a. Why do you think that is true?

11. Did any of these prompts encourage you to make a change in your lifestyle because of the information you learned?
    a. If yes, why?
    b. If yes, how did your lifestyle change?

c. If no, why not?

12. Which type prompt did you like the best?
    a. Why?

13. Which type prompt did you like the least?
    a. Why?

14. Which prompt was the easiest to answer?
    a. Why?

15. Which prompt was the hardest to answer?
    a. Why?

16. How did you feel about the prompt in which there was a smaller group?

17. Did any of these discussions cause you to change your views concerning an environmental issue?
    a. If yes, which discussion?
    b. If yes, what view did you change?
    c. If no, why?

APPENDIX I

STUDENT REFLECTION FORM

Appendix I
Student Reflection Form

APES Reflection on Current Event _____

Directions: Write a reflection of at least three sentences describing your feelings about the _____ Current Event. Possible Ideas: Was this current event interesting? Did it relate to the topic we were studying at the time? Did it help you to understand energy topics? Did you learn anything you did not know? Did you have an "aha" moment? (a moment where it suddenly all made sense?) You may also use the back of the sheet if necessary. How did you like the format of the Current Event?