Smith seniors and Ecological Literacy: Education for a Green Future

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Abstract:

Ecological literacy, or otherwise environmental awareness, knowledge and understanding of ecology and natural systems, and environmentally friendly actions, is important for students to have a grasp of because there are so many environmental problems that the planet is currently facing. In order to address those problems and find solutions now, as well as to protect the planet for the future, people need to know how to consider the environment in their everyday actions. The purpose of this study was to examine the ecological literacy of seniors at Smith College. Short surveys were distributed to 560 traditional-aged seniors by student mailboxes and 65 were returned. Many students who come to Smith are aware of and concerned about the environment before they get here. Whether this is intentional or not, it appears that Smith is attracting environmentally aware students. Overall Smith seniors were ecological literate. The majority of survey respondents have their computer set to the sleep mode, and the majority of respondents always turn off the water when they brush their teeth. However, despite that the majority of respondents agreed the living in America, we consume a disproportionate amount of natural resources, more than half of respondents always, frequently, or sometimes have leftover food on their plate. Environmental education at Smith could be improved by having an ESP major, a pre-orientation focused on environmental education, a two-credit EVS course that any student could take, and the development of a Center for the environment.

Introduction:

The time has come once again. Seniors in the United States are about to graduate, continuing the yearly cycle of American education. “What are your plans for after graduation?” is a question that evokes excitement, but also fear- fear of the real world and fear of reality. In the real world, seniors will soon be facing independence, paying bills, getting a job, etc. However, graduating seniors are not alone in their fear, for "if one listens carefully, it may even be possible to hear the Creation groan every year in late May when another batch of smart, degree-holding, but ecologically illiterate, Homo sapiens who are eager to succeed are launched into the biosphere" (Orr, 2004).

The real world reality that seniors are entering has many very real problems concerning the treatment of our natural environment, our high consumption rates, climate change and our apparent lack of foresight on issues like sustainability. This reality is in existence not only because of widespread ignorance among the human race, but also from the work of educated
with people with undergraduate degrees and beyond (Orr, 2004) because their work does not consider environmental consequences.

What good then are undergraduate degrees if they are not matched with someone who has the desire to use that education to prevent further deterioration of our planet? What good is education at all if it does not educate people about our natural environment, how it works, or about how to protect it by consuming less and practicing sustainability? In order to prevent environmental crises in the future and repair the damage done thus far, our current education system must be transformed, for "it is not education, but education of a certain kind, that will save us" (Orr, 2004).

Although there is a problem with the fact that many people are not ecologically literate, the bigger problem is that education about ecological literacy does not, at large, exist. Education needs to include environmental education so that students are educated holistically (Orr, 2004). Holistic education in this context means that students can relate one field of study to another, and then to the environment, or in other words, see the whole picture. Orr also states that “the goal of education is not mastery of subject matter but mastery of one's person”. Holistic education and education without a focus on mastering subject matter are important because in order for students to consider the implications of their actions on the environment, they must be taught how to see the big picture and how to step away from their area of focus.

Despite the broadness of the concept, ecological literacy can be explained, but a definition in the dictionary does not exist. Many people have defined this term according to their personal beliefs. David Orr, in his book Earth In Mind, lists a variety of topics he thinks any person should have some grasp of, including thermodynamics, ecology, carrying capacity, energetics, least-cost/end-use analysis, limits of technology, appropriate scale, sustainable
agriculture and forestry, steady-state economics, environmental ethics, the art of living well in a place, growing food, building shelter, using solar energy, and a knowledge of local soils, flora, fauna, and the watershed. Tackling all this in any educational institution seems daunting. All of this can be interpreted to mean that ecological literacy is a concept that places value on having knowledge and understanding of ecology and natural systems, and being able to apply this knowledge and understanding to everyday life.

If indeed ecological literacy among graduates is essential for affecting our planet’s health, how close do Smith seniors come to meeting the challenge? Are we prepared, as many of us would like to think, to make a difference? The world’s environmental problems have been escalating, yet not enough action has been taken. Instead, there is a seeming hope of procrastination until a choice for action does not remain. The time though, is now. Putting off action is only riskier. The problem is that in order to take action, people need to have the right skills, knowledge, and desire to make a difference. However, the skills, knowledge and desire to make a difference in our environment are not taught to young people. Education does not include classes about ecology or environmental ethics. At colleges and universities, liberal arts institutions particularly, environmental education is not as integrated in curriculum as it could be. Education today is not creating environmentally aware graduates; instead, education occurs within the limits of a given field of study. How then, can we expect to protect our planet, if the majority of our citizens have no appreciation, say for example, the ecological value of biodiversity?

My specific issue of investigation therefore, will be ecological literacy among seniors at Smith College. What I expect to find is that the majority of Smith seniors will not be ecologically literate, or at least that they will not demonstrate this literacy in their everyday
actions. This would therefore imply a need for environmental education on a broader level at Smith. If Smith takes initiative in educating students to be ecologically literate, not only would Smith’s community be more sustainable, but the impact that graduating seniors from this college have on the planet every May could hopefully be reduced. If Smith can teach biology majors to appreciate green design or economics majors to understand the value of species diversity, they could start to make a difference.

Methodology:

Survey Design

There were many considerations I kept in mind when designing my survey. Not only was the content important, but the length and appearance were also important. One of my main priorities was to keep the survey short with the rationale that more seniors would complete the survey. Additionally, although I wanted the survey to be easy to fill out, I also did not want to use a lot of paper. These constraints helped me think about what I wanted to learn from the survey, and what questions I needed to ask in order to gather the necessary data. In this study, I chose to examine students’ environmental awareness and concern, short term actions, and long term values.

The questions in the survey were designed to find information on four areas. These areas included students’ opinions on their environmental awareness and concern before Smith, how being at Smith had changed awareness about or concern for the environment, environmental actions students take at Smith, and lastly students’ overall values and future actions related to the environment. Please see attached survey in Appendix.
Survey Distribution

My ideal goal was to survey the entire senior class at Smith. I was planning on doing this by distributing surveys within campus houses and the Friedman apartments. I initially planned to contact a person in every house who would help encourage and motivate seniors to complete their surveys. However, after casually questioning my peers, many expressed that they would be more likely to complete a survey that they received in their mailbox in the campus center. That way, they could conveniently return it through campus mail before leaving the building. Surveys distributed to individual student rooms would require an extra step in returning the survey because students would have to remember to return the survey on their way out of the house. Because of this feedback, I decided to distribute surveys using the student mailboxes. A total of 560 surveys were distributed to traditional-aged seniors. Ada Comstock seniors and any senior living off campus without a Smith box did not receive a survey.

Survey Collection and Data Analysis

Surveys were returned through the campus mail to my mailbox. I received a total of 65 surveys, or about 12% of those administered, within one week of distribution. Data was entered, organized and analyzed using Microsoft Excel.

Results:

The data gathered from the survey questions is presented below. The survey questions found information in four areas, including students’ opinions on their environmental awareness and concern before and after being at Smith, environmental actions students take at Smith, and students’ overall values and future actions related to the environment.
Environmental Awareness and Concern Before and At Smith

First, the majority of survey participants (89%) felt that they entered Smith with prior environmental awareness (see Figure 1). Furthermore, the majority of survey participants (83%) felt that they entered Smith with concern for the environment (see Figure 2).

The 11% of survey participants who did not agree that they were aware of environmental issues prior to Smith all agreed (100%) that being at Smith had made them more aware of environmental issues (see Figure 3). Likewise, of the 17% of survey participants who did not agree that they were concerned about the environment prior to Smith, 88% agreed that being at Smith had made them more concerned about the environment (see Figure 4).

Many survey participants agreed that being at Smith had both made them more aware of and concerned for the environment. Nearly half of participants (41%) became more aware and concerned through both curricular and extra-curricular activities at Smith; however, 19% of respondents saying they were not influenced at all by either of these factors (see Figure 5).

Actions at Smith and Values Beyond

An overwhelming 95% of students have their computers set to the hibernate/sleep mode as recommended by ITS. Of the three respondents who said no, two of them did not even have a computer (see Figure 6). From this perspective, this is a very ecologically literate group.

In response to the statement about wanting a job that demonstrates environmentally sound and socially just practices, the majority (74%) of respondents agreed or strongly agreed (Group SAA) that this was important to them (see Figure 7). On the other hand, 26% felt neutral or disagreed (Group ND) with this statement.
Figure 1: Before coming to Smith, I was aware of environmental issues. Strongly agreed, 35%; agree, 54%; neutral, 9%; disagree, 2%; strongly disagree, 0%.

Figure 2: Before coming to Smith, I was concerned about the environment. Strongly agreed, 39%; agree, 44%; neutral, 10%; disagree, 0%; strongly disagree, 7%.
Figure 3: Being at Smith has made me more aware of environmental issues. Survey participants who felt neutral or disagreed that they were aware of environmental issues prior to Smith (11%, see Figure 1) all agreed that being at Smith had made them more aware of environmental issues.

Figure 4: Being at Smith has made me more concerned about the environment. Of the survey participants who felt neutral or strongly disagreed that they were concerned about the environment prior to Smith (17%, see Figure 2), 88% agreed that being at Smith has made them more concerned about the environment.
Figure 5: Any change in awareness/concern for the environment has happened through what activities? Participants answered curricular, 18%; extra-curricular, 22%; both, 41%; neither, 19%.

Figure 6: I have turned my computer so it will go into hibernate/sleep mode as suggested by ITS. Nearly every participant said yes, with only 2%, or just one respondent, answering no. Two students did not own computers.
Figure 7: I want a job that demonstrates environmentally sound and socially just practices. Only 26% of respondents felt neutral or disagreed with this statement, while 74% agreed or strongly agreed.

Figure 8: The environment is an issue that very strongly affects how I vote. Group SAA shows 53% of responses strongly agreeing that the environment is an issue that affects how they vote, whereas Group ND shows 47% of responses feel neutral about the environment affecting their voting.
Additional results were generated by comparing the two groups formed by the response to the above statement. The environment has a greater effect on voting among Group SAA than among Group ND (see Figure 8). Group SAA strongly agreed (53%) that the environment affected how they vote and Group ND responded neutral (47%) to how the environment influenced their vote, and of Group ND, 20% disagree that the environment affects how they vote at all.

Of Group SAA, 98% agreed or strongly agreed that living in America, we consume a disproportionate amount of natural resources (see Figure 9). In Group ND, 82% agreed or strongly agreed with this statement. Nearly twice as many responses from Group SAA strongly agreed than as from Group ND.

Nearly half (48%) of respondents from Group SAA always recycle everything they can at Smith (see Figure 10). That is about double the percentage that always recycles from Group ND. At Smith, 6% of respondents in Group ND never recycle at Smith, and 6% also say they will never recycle beyond Smith (see Figure 11). Despite the fact that only 48% of Group SAA always recycles at Smith, 54% of this group will always recycle beyond Smith. In Group ND, while at Smith, less, or only 18% recycle sometimes and 6% occasionally (see Figure 11). More respondents (29%) will sometimes recycle after Smith than do now.

Overall, more respondents from Group SAA (21% always) than from Group ND (6% always) use recycled paper to print drafts and other less important documents (see Figure 12). 2% of Group SAA never use recycled paper compared to 29% from Group ND. Participants were also asked if they carried and used a reusable beverage container. In Group ND, 24% of respondents never do this, compared to about one-third (8%) of that from Group SAA who never
Figure 9: Living in America, I easily consume a disproportionate amount of natural resources. 67% of Group SAA strongly agrees with this statement, whereas only 35% of Group ND strongly agrees.

Figure 10: I recycle everything I can at Smith. 48% of Group SAA recycles always, with 40% recycling frequently. 24% of Group ND recycles always, with 47% recycling frequently.
**Figure 11:** I will continue to recycle after I leave Smith no matter what. 54% of Group SAA strongly agreed; 24% of Group ND strongly agreed.

**Figure 12:** I use recycled paper to print drafts and other less important documents. 21% of Group SAA always uses recycled paper compared to 6% of Group ND. 29% of Group ND never uses recycled paper compared with 2% of Group SAA.
or occasionally do (see Figure 13). Of Group SAA, 75% always or frequently do, compared to 65% who always or frequently do in Group ND.

The majority of participants from both Groups SAA (86%) and ND (70%) said that they always turn off the water when they brush their teeth (see Figure 14). No one from either group said that they never turn off the water. Participants were also asked how often they had leftover food on their plates after meals. Nearly half of Groups ND (47%) said that they always or frequently have leftovers, whereas 25% of Group SAA always or frequently had leftovers (see Figure 15).

**Figure 13:** I carry and use a reusable beverage container. 24% of Group ND never do this, compared to about one-third (8%) of that from Group SAA who never or occasionally do.
Figure 14: I turn off the water when I brush my teeth. 86% of Group SAA always turns off the water and 70% of Group ND always does. None of the respondents from either group said they never turn the water off.

Figure 15: I have leftover food on my plate after meals. The peak of Group SAA (42%) is at sometimes and the peak of group ND (29%) is at frequently.
Discussion:

The results show that overall Smith students are ecologically literate, although not in all areas. Nevertheless, 95% of students have their computers on sleep/hibernate mode, as recommended by ITS (Figure 6). This seems to provide evidence that Smith students are very ecologically literate; however, beyond the surface, this may not actually be. It is very probably that the high percentage is due to the campaigns on campus for the past two years advocating for students to turn their computers to sleep mode. The benefits are that it not only saves the college energy and money, but there was also the added reward of earning enough wind energy to power all of the student computers. Making a choice to set your computer to an energy-saving mode out of concern for the environment versus setting it to that mode because you are being encouraged to by many other people who are doing the same thing are two very different reasons for taking action. Therefore, 95% of computers set in energy-saving mode is not necessarily a reflection of ecological literacy among participants, but instead could be a reflection of how successful campaigning for change has been at Smith College.

Environmental Awareness and Concern Before and At Smith

As evidenced in Figures 1 and 2, a larger percentage of survey participants said that they came to Smith with a previous awareness of and concern for the environment. This is significant for three reasons. One is that whether intentionally or by chance, Smith is seemingly attracting environmentally aware individuals as applicants. This could explain why the overall results are more representative of an environmentally conscious student body. Secondly is that the results could be skewed by the nature of the study. Because recipients of the survey had a choice about completing it, there was likely a non-response bias. People who were more likely to answer the
survey may have answered differently than people who were less likely to fill it out. Therefore, these results may not be an honest representation of the senior class as a whole.

The third reason that a majority of previous awareness and concern for the environment is significant is because there will likely be less of a change in those views while at Smith. Although, overall, many students agreed that being at Smith had made them more aware and concerned for the environment, the students who felt that they had no previous environmental concern and awareness mostly all agreed that being at Smith had made them more aware and concerned about the environment (see Figures 3 and 4). Among all survey participants, the results related to any change in environmental awareness or concern (Figure 5) demonstrate that Smith’s environment, both curricular and extra-curricular, is conducive to increasing environmental awareness and concern among students.

Something I would have done differently related to this section would be to have asked participants what specifically had increased their environmental awareness and concern. For example, was it specific classes or specific groups on campus, and was the change in awareness or concern for the environment sought out or just due to being at Smith? Asking questions like this in the future will provide information about what classes or campus activities are important to maintain, and also how students are intersecting with the information.

*Actions at Smith and Values Beyond*

In order to understand how important the environment is in people’s lives, especially related to their future choices, I asked them if they wanted a job that demonstrated environmentally sound and socially just practices. Recall that 74% of respondents strongly agreed or agreed (Group SAA) that they wanted such a job, while 26% felt neutral about or
disagreed (Group ND) with the idea (see Figure 7). If respondents are aware of environmental issues and concerned about the environment, then they are more likely to want a job reflecting this.

Because I wanted to compare survey respondents not just by responses to each question, but also within the group of respondents, I needed to divide the survey responses. I chose to divide the responses based on answers to the above question because it considers environmental actions not just here at Smith but personal actions in the future.

The environment as an issue that affects voting was of greater influence among Group SAA (see Figure 8). Although it is easy to assume that the difference between Group SAA and Group ND is due to actual difference in how the environment affects voting, I did not exclusively ask in the survey if people voted. Therefore, the 20% of respondents in Group ND who disagreed could have been due to the possibility that they do not vote at all. On that note, there were three international students who responded to the survey; however, I simply did not include their responses in this analysis. Therefore n = 62 for Figure 8.

Referring to Figure 9, I asked if living in America we naturally consume a disproportionate amount of natural resources. The question answers suggest how well respondents understood the reality of some of our current environment problems. Overall, the majority of students (93%) agreed or strongly agreed that living in America we consume a disproportionate amount of natural resources. The difference between Group SAA and Group ND could imply that people who want a job that demonstrates environmentally sound and socially just practices are more aware of environmental issues.

Recycling at Smith is overall successful (see Figure 10) which is great considering Smith has provided recycling bins in every student room on campus. Recycling at Smith is also very
convenient because it is free. Despite the benefits of recycling at Smith and the possible lack of these benefits beyond Smith, fewer participants say that they will recycle beyond Smith than recycle always now (see Figure 11). Ironically, this probably will not be the case. It is already very easy to recycle here at Smith. If you are going to recycle, wouldn’t you be recycling here? This may indicate that in general the survey responses are on the optimistic side of the spectrum. Respondents may have been giving themselves the benefit of the doubt when answering questions, thus the results may not convey reality.

Overall, the majority (83%) of respondents always or frequently recycles at Smith; however, in addition to recycling cans or paper by putting them in a bin, there are other forms of recycling, as well as reuse and reduction, that are possible, although not as obvious. First, using recycled paper to print drafts is an additional way to recycle (see Figure 12). This also has economical advantages because it is used more than one time. The difference between Group SAA and Group ND could be coincidental because I did not ask if people had their own printer. Students without their own printer may be limited to printers on campus, where recycled paper cannot be inserted as easily.

Reusable beverage containers are a great way to practice reuse and reduce consumption by not needing a new paper or plastic cup as frequently. Despite this, some students still never carry a reusable container when they are on the go (see Figure 13).

I also asked students if they turned off the water when they brushed their teeth because this is another small action that can make a big difference. By doing this we are consuming less water as well as conserving water for future use. Generally, students are very savvy about always turning off the water when brushing their teeth (see Figure 14).

Finally, are students’ eyes bigger than their stomachs? Having leftover food on your
plate can add up quickly when it happens continually. Reducing our consumption by not loading our plate with food we cannot eat will save waste in a landfill later as well as the energy and fuel that was used to grow and transport the food. Survey respondents could use some help in this area (see Figure 15). In both Group SAA and Group ND, fewer people occasionally or never have leftover food on their plates than always or frequently.

These last four questions are significant because each action is a less obvious way that students can demonstrate their awareness of and concern for the environment. Despite the fact that the majority of students recycle, not as many students are recycling in all the ways that they could be.

*The Big Picture and Recommendations*

The significance of these results in the long term is that although many students are aware of and concerned about the environment, overall their actions do not demonstrate huge efforts they make in their daily lives to demonstrate this awareness or concern. There are many positive results that are worth applauding, such as computer settings and not wasting water. However, there is an apparent lack of a formed connection between the fact that many students agreed that living in America, we consume a disproportionate amount of natural resources, and the fact that students often have leftover food on their plate. How is it that students can be so smart in way, but so uninformed in another? Our ecological literacy can only extend as far as our education has allowed us to go, so Orr would probably argue that education is the problem.

Addressing the lack of ecological literacy in education, many changes could be made at Smith in order to increase students overall ecological literacy. A few recommendations include many of the ideas we have discussed in the seminar, including an Environmental Science and
Policy major, a Center for the Environment, an environmental education specific pre-orientation program, and a two-credit EVS course aimed at non-science majors.

An Environmental Science and Policy major would possibly provide a combination of breadth and depth. Being an EVS minor myself, there are only so many topics I have been able to take a class about yet other topics I would love to learn more about. A major could be designed similarly to the minor, with different categories such as biology, policy, etc., where students could choose what classes to take. This would allow interested students to pursue this academic area more in depth and over a wider range a topics.

A two-credit EVS course would be a great way to open up the ESP department and make a course similar to EVS 300 more accessible to a wide range of students. This class could be offered as a first year seminar, but I think it would be more effective as a course that was offered every year and open to all years and majors. This would be a nice contrast to the ESP major, and could even act to help interest younger students in majoring in ESP.

The addition of an environmental education pre-orientation program would be a great way to provide students with a background in this subject area. This program could be a combination of hiking and time spent at Smith, as some pre-orientation trips already do. The program could acquaint students with a general knowledge base as well as educate them about more detailed issues at Smith or in the Northampton community that need to get addressed, such as food wastes and unnecessary water usage. The pre-orientation could also connect students to opportunities for ways to get involved with environmental groups on campus.

A Center for the Environment could exist on its own but could also be a means to put all of these ideas under one roof. The center could house the ESP department and therefore include classrooms and educational space. The Center could also function as a museum in some senses,
with educational exhibits related to basic ecology, global sustainability and local measures to increasing sustainability, advocacy and politics, local environmental history, and environmental ethics. This center would not only benefit the Smith community but ideally would also benefit the greater Northampton community for both educational and recreational activities. Inclusion of the Northampton community could provide students with the opportunity for involvement with local environmental issues.

The ultimate goal would not only be that environmental education would affect sustainability efforts at Smith, as well as in the Northampton community, but also that Smith graduates would take with them a sense of ecological literacy. This knowledge would provide them with the necessary means to demonstrate environmentally sound actions locally and live in a more environmentally friendly way.
Literature Cited:


Appendix:

Survey, Side A

Major:______________________________  House:____________________  Hometown and State:______________________________

Before coming to Smith, I was aware of environmental issues: strongly agree/agree/neutral/disagree/strongly disagree
Before coming to Smith, I was concerned about the environment: strongly agree/agree/neutral/disagree/strongly disagree
Being at Smith has made me more aware of environmental issues: strongly agree/agree/neutral/disagree/strongly disagree
Being at Smith has made me more concerned about the environment: strongly agree/agree/neutral/disagree/strongly disagree
Any change in awareness/concern for the environment has happened through my: curricular activities/extra-curricular activities/ both/neither
Living in America, I easily consume a disproportionate amount of natural resources: strongly agree/agree/neutral/disagree/strongly disagree
The environment is an issue that very strongly affects how I vote: strongly agree/agree/neutral/disagree/strongly disagree
I recycle everything I can at Smith: always/frequently/sometimes/occasionally/never
I will continue to recycle after I leave Smith no matter what: always/frequently/sometimes/occasionally/never
I carry and use a reusable beverage container: always/frequently/sometimes/occasionally/never
I use recycled paper to print drafts and other less important documents: always/frequently/sometimes/occasionally/never
I turn off the water when I brush my teeth: always/frequently/sometimes/occasionally/never
I have leftover food on my plate after meals: always/frequently/sometimes/occasionally/never
I have turned my computer so it will go into hibernate/sleep mode as suggested by ITS: yes/no/don’t have one
I want a job that demonstrates environmentally sound and socially just practices: strongly agree/agree/neutral/disagree/strongly disagree

Survey, Side B

EVS 300 Survey

Please complete by circling your answer for every question.
I will greatly appreciate it if you take 3 minutes to fill this out!!!

Return To:

BOX 6223