

UW-Stout
BIO 111 General Education Assessment
May 28, 2012

1. DEPARTMENT:

Biology

2. GENERAL EDUCATION CATEGORY:

General Knowledge, Appreciation and Values; Natural Sciences

3. COURSE NUMBER AND TITLE:

BIO 111; Science, the Environment and Sustainability

4. NUMBER OF SECTIONS INCLUDED IN THIS ASSESSMENT: 7

5. GENERAL EDUCATION OBJECTIVES:

- Understand, apply, and value methods in the life and physical sciences and the impacts of science on society.

6. METHODOLOGY:

One of the general education objectives of the BIO 111 course is to help students understand, apply, and value methods in the life and physical sciences and the impacts of science on society. To help achieve this objective, several of the lab activities include service learning components:

- At the beginning of the semester, each lab group studied the benefits of recycling then organized and implemented a recycling education and/or activity for the 2012 RecycleMania competition. RecycleMania is a national college campus recycling competition held every year from January to April. This was the sixth year that Stout competed in the competition, and the fourth year this service learning project was incorporated into the BIO 111 curricula.
- At the end of the semester, students learned the skills needed to monitor the health of streams. Working within their lab groups, they made visual observations of habitat and land uses; measured the physical and chemical characteristics of water; and assessed the abundance and diversity of macro-invertebrates. At the end of the stream monitoring labs, students analyzed and summarized the stream monitoring data.

This was the fifth year an online pre- and post-course Qualtrics survey was used to assess this general education objective. Environmental beliefs and actions were measured using 34 different questions with 17 identified as beliefs (B) and 17 identified as actions (A) (Table 1). Student responses were recorded using a 5-point Likert-type scale ranging from 1 (strongly agree) to 5 (strongly disagree).

At the beginning of the spring 2011 semester, an email was sent to all students enrolled in BIO 111 asking them to click on the survey link to take the survey. During the last week of the semester, the same students were asked to take the post-survey. The same questions were used for both surveys.

Table 1. Environmental Actions/Beliefs Survey: Pre-course/Post-course mean scores for BIO 111, spring 2012 semester.

A = Actions B= Belief	Q #	Environmental Attitudes Survey Questions	Significantly Different?	Independent T-test	Mean (S.D.)	
					Pre	Post
B	1	My actions make a difference	no	t(223)=1.66, p=0.10	1.9 (0.7)	1.7 (0.8)
B	2	Working with non-profit organizations can be a valuable worthwhile experience.	yes	t(223)=12.42, p=0.02	2.2 (0.8)	1.9 (0.8)
B	3	I believe the world will be a lesser place if species go extinct.	no	t(222)= 0.23, p=0.82	1.5 (0.8)	1.6 (0.9)
B	4	I want to take action on environmental issues.	no	t(223)=1.79, p=0.08	2.1 (0.7)	1.9 (0.8)
B	5	I believe I'm making a positive contribution to this City.	yes	t(223)=3.75, p<0.05	2.5 (0.8)	2.1 (0.7)
B	6	I believe I'm making a positive contribution to Stout.	yes	t(221)=1.95, p=0.05	2.1 (0.7)	1.9 (0.6)
B	7	Special habitats should be set aside for endangered species.	no	t(222)=1.93, p=0.06	1.8 (0.8)	1.6 (0.8)
B	8	Laws regarding water quality should be stricter.	yes	t(223)=2.19, p=0.03	1.9 (0.8)	1.7 (0.8)
B	9	All plants and animals play an important role in the environment.	yes	t(223)=2.19, p=0.03	2.0 (0.9)	1.7 (0.9)
B	10	I believe there is a connection between the health of the environment around me, and my well-being.	yes	t(223)=2.84, p<0.05	1.8 (0.8)	1.5 (0.6)
B	11	It bothers me to see natural environments destroyed.	no	t(223)=0.7, p=0.48	1.7 (0.8)	1.6 (0.8)
B	12	We must prevent any type of animal from becoming extinct, even if it means sacrificing some things for ourselves.	no	t(223)=0.37, p=0.71	2.1 (0.9)	2 (0.9)
B	13	I believe Wilderness is valuable even if I never get to use or visit it.	no	t(223)=1.92, p=0.06	1.5 (0.6)	1.4 (0.5)
B	14	I recycle because I want to make a difference.	no	t(222)=1.47, p=0.14	1.9 (0.8)	1.7 (0.7)
B	15	I recycle because it's the law.	yes	t(223)=2.83, p<0.05	2.9 (1.1)	2.4 (1.1)
B	16	If everyone works together, many of society's problems can be solved.	yes	t(222)=3.74, p<0.05	2.3 (0.8)	1.9 (0.7)
B	17	Service learning can be incorporated into college courses.	yes	t(223)=3.95, p<0.05	2.0 (0.8)	1.6 (0.7)
A	18	I make sure all lights are off being leaving my home/dorm room.	yes	t(223)=3.56, p<0.005	1.9 (1.0)	1.5 (0.6)
A	19	I take short showers to conserve water.	no	t(222)=1.63, p=0.11	2.9 (1.0)	2.7 (1.1)
A	20	I make a conscious effort to conserve resources.	yes	t(223)=4.31, p<0.005	2.4 (0.8)	2.0 (0.7)

A	21	When it comes to environmental awareness, my actions set a good example for friends and family.	yes	t(222)=3.74, p<0.005	2.3 (0.8)	1.9 (0.7)
A	22	I know the rules for recycling on campus and in the City.	yes	t(223)=3.65, p<0.05	2.5 (1.0)	2.0 (0.8)
A	23	I don't litter.	yes	t(222)=2.10, p=0.04	1.9 (0.9)	1.6 (0.8)
A	24	I am involved in environmental organizations/clubs.	no	t(221)=0.06, p=0.95	3.6 (1.0)	3.6 (0.9)
A	25	I recycle on a daily basis.	yes	t(223)=2.16, p=0.03	2.1 (0.9)	1.9 (0.7)
A	26	I take action on environmental issues.	yes	t(223)=2.86, p=0.005	3.0 (0.8)	2.6 (0.8)
A	27	I will vote in the next congressional election.	no	t(223)=0.11, p=0.91	2.1 (1.1)	2.2 (1.2)
A	28	I walk as much as possible, instead of driving my car.	no	t(222)=0.85, p=0.39	2.3 (1.0)	2.2 (1.1)
A	29	I carpool as much as possible.	yes	t(220)=2.34, p=0.02	2.6 (1.1)	2.2 (1.1)
A	30	I will pay more for food grown in an environmentally responsible manner.	no	t(222)=1.37, p=0.17	2.7 (1.0)	2.5 (1.0)
A	31	I support the protection of an endangered bird species, even if I were never able to see one in the wild.	yes	t(223)=2.08, p=0.04	2.2 (0.9)	1.9 (1.0)
A	32	I make personal sacrifices for the sake of slowing down pollution.	yes	t(221)=2.27, p=0.02	2.6 (0.9)	2.3 (0.9)
A	33	I have participated in service learning projects that were part of a college course.	yes	t(221)=10.23, p<0.005	3.1 (1.0)	1.8 (0.8)
A	34	I plan to participate in volunteer projects to help my community.	no	t(221)=1.20, p=0.23	2.3 (0.9)	2.2 (0.9)

7. RESULTS:

Pre-course and Post-course Environmental Beliefs/Actions Survey:

Total enrollment for the course was 168 (7 sections with 24 students each); 147 (88%) students responded to the pre-course survey and 78 (46%) responded to the post-course survey.

Independent T-tests were performed for the results of each question. The results indicate that the scores for a majority of the survey questions were higher for the post-course survey compared to the pre-course survey (Table 1).

Of the 34 survey questions, 20 resulted in significant differences between the pre and post course answers. The three questions with the greatest difference between pre and post course means were:

- Question #33: *I have participated in service learning projects that were part of a college course.*
- Question #22: *I know the rules for recycling on campus and in the City.*
- Question #32: *I recycle because it's the law.*

Fourteen questions revealed no statistically significant differences between the pre and post course answers. However, the mean scores for these questions were closer to 2.0 on the Likert

Scale (agree) for both the pre and post course surveys, indicating these students most likely had a positive environmental ethic before enrolling in the course. Many students choose to take BIO 111, over other general education science courses, because they have a strong interest in environmental issues. The question that scored 3.6 (disagree) for both pre and post course was:

- Question #23: *I am involved with environmental organizations and clubs.*

8. REFLECTION:

Pre-course and Post-course Environmental Beliefs/Actions Survey:

It is our belief that as a result of enrolling in Science, Society and the Environment (BIO 111) students understand, apply, and value methods in the life and physical sciences and the impacts of science on society. After taking this course, most students walk away with a greater understanding of how their individual actions make a difference. We believe the service learning aspect of the course helps students make this connection. One of the instructors (Krista James) requires students to conduct out-of-class community service; many choose to clean litter from Galloway Creek. Excerpts from 2 different essays help highlight the deeper learning acquired as a result of taking BIO 111.

Student 1: BIO 111 has helped to reinforce many practices I already do, or know I should do and neglect on occasion. It has opened my eyes to different views of industry and balance in nature. In the words of Cassie, "Bio has ruined my life". Said with a laugh and a smile of course, it has ruined our lives in that we can no longer watch poor recycling or see litter and not do or say something about it. We are currently hyper alert to the amount of damage being caused to our planet and the effect we can each individually have on the environment.

Student 2: Before BIO 111, I didn't even know where Galloway Creek was or how it was affected by the trash and water from the storm drains. It was really fun to explore the creek and see the various states of the creek today and the remains of what has been done to it in the past. BIO 111 has deepened my passion and given me a wealth of information! Honestly, this has been one of my favorite classes during college and I have learned so much. I hope that I can retain the information and keep adding to it so that I can use all of this knowledge in my future career and every day in my lifestyle. I am much more conscientious about how my everyday decisions affect the earth and those around me.