



GOING GREEN

THE ASSESSMENT OF SUSTAINABILITY WITHIN GENERAL EDUCATION AT CSU, CHICO, 2017

This document summarizes the activities and findings of the Sustainability SLO Assessment Committee of the Curriculum Advisory Board for the General Education Program at California State University, Chico, during the Spring 2017 – Fall 2017 semesters.

GOING GREEN

THE ASSESSMENT OF SUSTAINABILITY WITHIN GENERAL EDUCATION

SUSTAINABILITY ASSESSMENT COMMITTEE MEMBERS

Diana Flannery

Don Miller

Rachel Middleman

Nate Millard

David Philhour

TABLE OF CONTENTS

Background.....	2
Data Collection	3
Student Participation.....	4
Demographics.....	6
Knowledge	10
Pathway Scores	11
Scores by Demographics.....	14
Attitudes	16
Areas of Concern.....	17
Behavior	20
Sustainability Events.....	21
Sustainable Behaviors	25
Summary	27
Conclusions	28



BACKGROUND

At California State University Chico, principles of Sustainability are taught in the General Education (GE) Program at both lower and upper division levels, as well as among the GE Pathways, including the Sustainability Studies Pathway. This emphasis on sustainability is consistent with Chico State's Sixth Strategic Priority (outlined below) and the General Education Values Student Learning Objective.

CSU, Chico's Strategic Plan: Sixth Strategic Priority

Believing that each generation owes something to those that follow, we will create environmentally literate citizens, who embrace sustainability as a way of living. We will be wise stewards of scarce resources and, in seeking to develop the whole person, be aware that our individual and collective actions have economic, social, and environmental consequences locally, regionally, and globally.

OUR GOALS

- To emphasize the need for all departments and programs to address issues of sustainability.
- To become an environmentally engaged university, articulating these values for the wider audiences we reach.
- To introduce outside experts and mentors on sustainability to the campus, while seeking to deliver our own powerful story of environmental engagement.
- To make Chico State the distinctive "green" campus in California and become a national leader in environmental education, science, and public policy analysis; to build environmentally responsible facilities; and to practice principles of sustainability.
- Chico State is a Member of the Association for the Advancement of Sustainability in Higher Education (AASHE)

GE Values Student Learning Objective for Sustainability

Describes and explains the dynamics associated with human activities, and assesses the value of balancing social and economic demands with the Earth's ability to sustain physical and biological resources and cultural diversity.

DATA COLLECTION



For this Sustainability Assessment, data was collected through administration of a Qualtrics survey created by the Institute for Sustainable Development (ISD) designed to assess students and alumni of CSU, Chico on their **knowledge**, **attitudes**, and **behavior** related to issues of sustainability. The following results are organized by these three categories.

The ISD developed this survey “to help better understand the nature, functioning, and valued practices of sustainability on CSU, Chico campus,” and to “help us understand how to teach sustainability across the curriculum better.” (Survey)

The Curriculum Advisory Board (CAB) Sustainability Assessment Committee asked instructors of upper-division GE courses with the sustainability Student Learning Objective (SLO) (except those in the Sustainability Studies Pathway) to administer the survey to their students during the Spring 2017 semester (March-May). The faculty in the Sustainability Pathway were asked for their student/course participation separately by the ISD committee.

Participants were asked to answer multiple-choice questions about knowledge of sustainability, and indicate how confident they are in their responses; and to rank attitude and behavior statements.

Criteria for inclusion: 1) completing the survey; 2) spending at least 10 minutes (600 seconds) to do so. This reduced the number of respondents from 1023 cases down to 733.

Student Participation

Table 1. Student Participation by Upper Division GE Course with Sustainability SLO (not in the Sustainability Pathway)

Course	Pathway	Total Enrollment	Frequency	Percent (%) Participation	Percent (%) Survey
MCGS 310	Gender and Sexuality	138	77	55.8	10.5
HIST 305	Health and Wellness	118	68	57.6	9.3
ANTH 340	Food Studies	152	63	41.4	8.6
ANTH 333	Science & Technology	141	59	41.8	8.0
GEOG/LAST 357	Global Development	66	36	54.5	4.9
RELS 357	Science & Technology	58	36	62.1	4.9
SOCI 335	International Studies	47	33	70.2	4.5
GEOG 303	International Studies	86	32	37.2	4.4
RELS 332	International Studies & Global Development	88	29	33.0	4.0
GEOG 352	Diversity Studies	48	25	52.1	3.4
BIOL/PHIL 322	Ethics Justice & Policy	25	22	88	3.0
ENGL 364	Diversity Studies	58	17	29.3	2.3
BIOL 302	Diversity Studies	23	1	4.3	0.1

Eight of the 10 pathways were represented in the sample. Student participation ranged from 4.3 to 88 percent per course. Pathway representation ranged from 5.8 percent (Diversity Studies) to 10.5 percent (Gender and Sexuality Studies). Nearly 68 percent of the sample were from the above pathways. Only 2 courses with the Sustainability SLO did not participate.

Table 2. Student Participation in Lower and Upper Division Sustainability Pathway Courses

Course	Frequency N=733	Percent of Survey Sample (%)
ENGL 130	43	5.9
Other (please specify)	40	5.5
GEOS 130	35	4.8
UNIV 105I	32	4.4
ANTH 116	4	.5
GEOG 101	2	.3
HIST 341	45	6.1
ECON 365	31	4.2
GEOG 304	2	.3
BIOL 350	1	.1

Thirty-two (32.1) percent of the sample represented students enrolled in classes in the Sustainability Pathway. Data was collected separately (by Sustainability Pathway faculty and ISD) and included in this analysis.

Demographics

Table 3. Class Level

	Frequency N=733	Percent (%)
1st Year	97	13.2
Sophomore	126	17.2
Junior	224	30.6
Senior	285	38.9
Total	732	99.9

Nearly 70 percent (69.5%) of the sample were juniors and seniors.

Table 4. Gender Identification

	Total Sample (N)	Percent (%)	Junior/Senior Only (N)	Percent (%)
Female	424	57.8	276	54.2
Male	305	41.6	233	45.8
Transgender	4	0.5		
Total	733	100.0	509	100.0

More female students completed the survey for the total sample (57.8%) as well as for junior/seniors (54.2%) students.

Table 5. First-Generation

	Total Sample	Percent (%)	Junior/Senior Only	Percent (%)
First Generation Student	323	44.1	228	44.8
Non First Generation Student	298	40.7	238	46.8
Total	621	84.7	466	91.6
Missing	112	15.3	43	8.4
Total	733	100.0	509	100

For the total sample, a greater number of first generation students completed the survey (44.1% vs. 40.7%). However, for junior/seniors, there were slightly more non-first generation students who completed the survey (46.8% vs. 44.8%).

Table 6. Recipients of Pell Grants

	Frequency	Percent (%)	Junior/Senior Only	Percent (%)
No	365	49.8	258	50.7
Yes	368	50.2	251	49.3
Total	733	100.0	509	100

For the total sample, a greater number of pell-eligible students completed the survey (50.2% vs. 49.8%). However, for junior/seniors, there were slightly more non-pell eligible students who completed the survey (50.7% vs. 49.3%).

Table 7. Ethnicity

	Frequency	Percent (%)	Junior/Senior Only	Percent (%)
White non-Hispanic	391	53.3	299	58.7
Hispanic/Latina/o	221	30.2	123	24.2
African American	35	4.8	21	4.1
Asian American	35	4.8	25	4.9
Other	29	4	23	4.5
Hmong	9	1.2	7	1.4
Pacific Islander	7	1	5	1
Native American	6	0.8	6	1.2
Total	733	100.0	509	100.0

For the total sample, student ethnicity was primarily White (53.3%), Hispanic/Latino (30.2%), African American (4.8%), and Asian American (4.8%). For juniors/seniors, students were mostly White (58.7%), followed by Hispanic/Latino (24.2%), Asian American (4.9%) and African American (4.1%).

Table 8. Field of Study

	Frequency	Percent (%)	Junior/Senior Only	Percent (%)
BSS	224	30.6	156	30.6
NSC	134	18.3	81	15.9
BUS	133	18.1	88	17.3
CME	92	12.6	73	14.3
ECC	74	10.1	64	12.6
HFA	53	7.2	40	7.9
Undeclared	23	3.1	7	1.4
Total	733	100.0	509	100.0

Students participation by college/field of study were primarily BSS, NSC, BUS, and CME.

Table 9. GE Pathway Self-reported by Respondents

	Frequency	Percent (%)	Junior/Senior Only	Percent (%)
Not chosen yet	175	23.9	61	12.0
Health & Wellness	91	12.4	68	13.4
Sustainability Studies	88	12.0	79	15.5
Food Studies	68	9.3	55	10.8
Gender & Sexuality Studies	65	8.9	52	10.2
Science, Technology, & Values	62	8.5	47	9.2
International Studies	57	7.8	51	10.0
Diversity Studies	47	6.4	37	7.3
Global Development Studies	41	5.6	32	6.3
Ethics, Justice, & Policy	34	4.6	23	4.5
Great Books & Ideas	5	0.7	4	0.8
Total	733	100.0	509	100.0

Pathway representation revealed varied participation. For the total sample, Not Chosen Yet (23.9%), followed by Health and Wellness (12.9%), Sustainability Studies (12.0%), and Food Studies (9.3%) reported the greatest number of surveys completed. For juniors/seniors, Sustainability Studies (15.5%) had the greatest participation, followed by Health and Wellness (13.4%).

KNOWLEDGE



The knowledge portion of the survey was designed to evaluate the depth and breadth of students' literacy in sustainability, including the imperative of balancing social, environmental, and economic needs with good stewardship of natural resources. Another important aspect of the survey concerns minimizing the long-term impact of humans on the planet through conscious choices in lifestyle.

Fourteen multiple choice questions were designed to represent some aspects of knowledge about key sustainability content from environmental, social, and economic views. They were also designed with various disciplines in mind. Knowledge questions included topics such as identifying factors influencing carbon dioxide levels, cost effective ways to address energy needs, efforts to promote sustainable action, reasons for persisting world hunger, definitions of sustainability and conservation, impacts of globalization, understanding the link between poverty and environmental degradation, external costs of pollution, examples of positive feedback loops, economic theory, and anthropocentrism.

Using Excel, a count was computed of the number of questions (N=14) each respondent got correct as well as the number wrong. From those counts along with the confidence measures for each question an average level of confidence for each participant for their correct answers (ConfR) and their average confidence level for those which were answered incorrectly (ConfW) was computed.

Pathway Scores

Figure 1. Mean Knowledge Score by Pathway, N=733

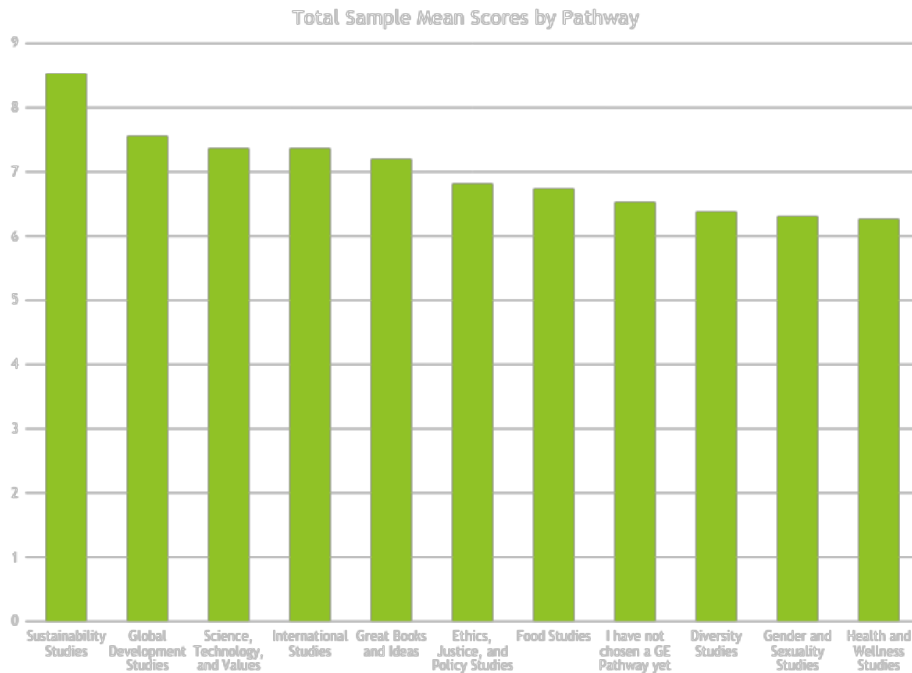


Table 10. Mean Knowledge Score by Pathway, N=733.

Pathway	Mean	N	Std. Dev	Std. Error
Sustainability Studies	8.53**	88	2.259	0.241
Global Development Studies	7.56	41	2.225	0.348
Science, Technology, and Values	7.37	62	2.376	0.302
International Studies	7.37	57	1.997	0.264
Great Books and Ideas	7.2	5	2.168	0.97
Ethics, Justice, and Policy Studies	6.82*	34	2.329	0.399
Food Studies	6.74*	68	2.085	0.253
I have not chosen a GE Pathway yet	6.53*	176	2.243	0.17
Diversity Studies	6.38*	47	2.318	0.338
Gender and Sexuality Studies	6.31*	65	1.811	0.225
Health and Wellness Studies	6.27*	91	2.093	0.219
Total	6.94*	733	2.279	0.084

There was an overall significant difference in scores between pathways. Among pathways in the total sample, a post hoc analysis revealed a significant pairwise difference between Sustainability Studies** and all pathways except Global Development, Great Books, Science, Technology, and Values, and

International Studies. There was no difference in scores between the other pathways when compared to Sustainability Studies.

Figure 2. Mean Knowledge Score by Pathway, Juniors and Seniors Only, N=509

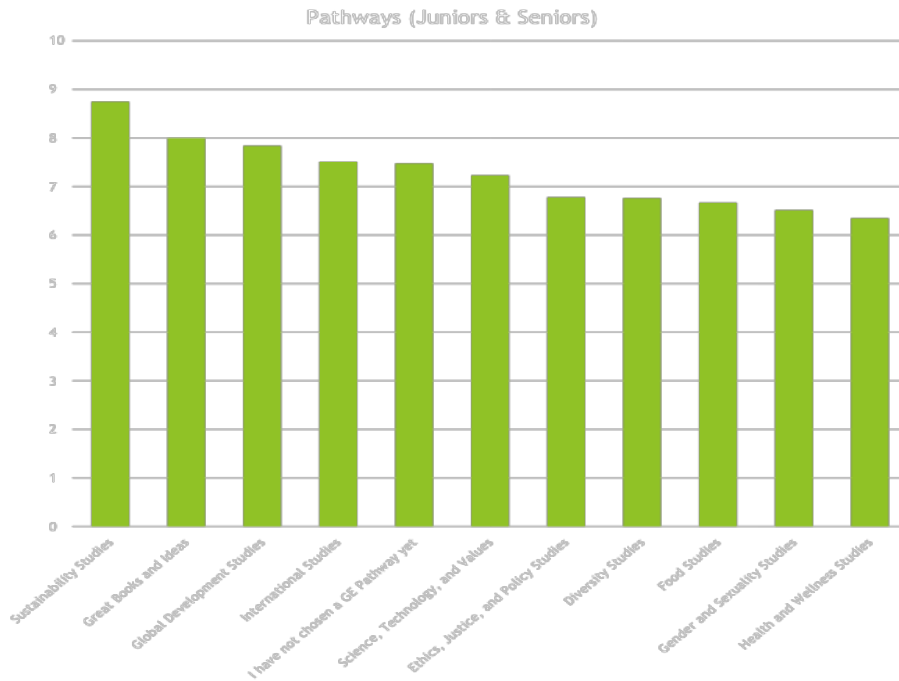


Table 11. Mean Knowledge Score by Pathway, Junior and Seniors Only, N=509

Pathway (Junior & Senior)	Mean	N	Std. Deviation	Std. Error
Sustainability Studies	8.75**	79	2.187	0.246
Great Books and Ideas	8	4	1.414	0.707
Global Development Studies	7.84	32	2.112	0.373
International Studies	7.51*	51	1.994	0.279
I have not chosen a GE Pathway yet	7.48*	61	2.102	0.269
Science, Technology, and Values	7.23*	47	2.513	0.367
Ethics, Justice, and Policy Studies	6.78*	23	2.43	0.507
Diversity Studies	6.76*	37	2.216	0.364
Food Studies	6.67*	55	2.152	0.29
Gender and Sexuality Studies	6.52*	52	1.873	0.26
Health and Wellness Studies	6.35*	68	2.224	0.27
Total	7.26*	509	2.284	0.101

For Juniors, there was an overall significance in scores between pathways when compared to seniors. A post hoc analysis revealed a significant pairwise difference between Sustainability Studies and all pathways except for Global Development and Great Books.

Scores by Demographics

Table 12. Mean Knowledge Score by Class Level, N=733

Student Level	Mean	N	Std. Deviation
Freshman	5.68	97	2.187
Sophomore	6.57	126	1.899
Junior	7.16	224	2.231
Senior	7.34	285	2.326

Knowledge scores improved with class level. There was a significant relationship between groups with freshman having the lowest mean knowledge scores and seniors having the highest ($p < .001$).

Table 13. Knowledge Scores by Ethnicity

Mean Scores of Total Sample (n=733) vs. Juniors/Seniors (N=411)				
What is your ethnicity?	Mean**	N	Mean**	N
Hispanic / Latina/o	6.19	221	6.47	110
African American	5.97	35	6.26	19
Native American	7.33	6	7.50	2
White non-hispanic	7.42	391	7.44	240
Hmong	6.78	9	6.33	6
Pacific Islander	5.00	7	6.25	4
Asian American	7.31	35	7.53	15
Other (please specify)	7.28	29	7.60	15
Total	6.94	733	7.11	411
** sig at < .01				

Scores differed significantly from each other based on ethnicity for both the total sample and Juniors/Seniors only. There was an overall significance in scores between ethnic groups.

Among the total sample, a post hoc analysis revealed a significant pairwise difference in scores between White non-Hispanic and Hispanic/Latino and African American students.

For Juniors/Seniors, a post hoc analysis revealed a significant pairwise difference in scores between White non-Hispanic and both Hispanic/Latino and African American students.

Table 14. Knowledge Scores by First-Generation and Not First-Generation

	Mean**	N	Std. Deviation
First Generation Student	6.75	323	2.318
Not First Generation	7.26	298	2.278

First Generation students scored significantly lower than non-first generation students ($p < .01$)

Table 15. Knowledge Scores by Pell Grant Eligible and Not Pell Grant Eligible

Pell	Mean**	N	Std. Deviation
No	7.17	365	2.245
Yes	6.71	368	2.293
Total	6.94	733	2.279

Pell-eligible students scored significantly lower than students without financial aid ($p < .01$).

Table 16. Knowledge Scores by Gender

	N=733		N=411	
Gender	Mean**	N	Mean	N
Female	6.69	423	6.99	234
Male	7.28	310	7.27	177
Total	6.94	733	7.11	411

Men scored significantly higher than women ($p < .01$) for the total sample only.

ATTITUDES



The second principal metric of the assessment survey was that of attitudes. Mere knowledge of topics in sustainability, in and of itself, is an incomplete evaluation of the potential for good stewardship, unless an awareness of areas of concern exists in the respondents. Attitudes may mediate strongly the behaviors affecting patterns of activity affecting the environment directly or indirectly. The attitudes section of the survey ranks the importance of sustainability problems. It also aims to capture the perceptions students arrive with and how these change over time.

With this in mind, the next task was creating a rank ordering of the 15 areas of concern for each respondent. With the data as it is presented, one may ascertain how many students put Clean Water in the top 5 (highest) level of concern, as well as within that top 5 what the counts were on ranking. Same for middle 5 and lowest 5.

Areas of Concern

Figure 3. Rating Areas of Concern Total Sample N=733

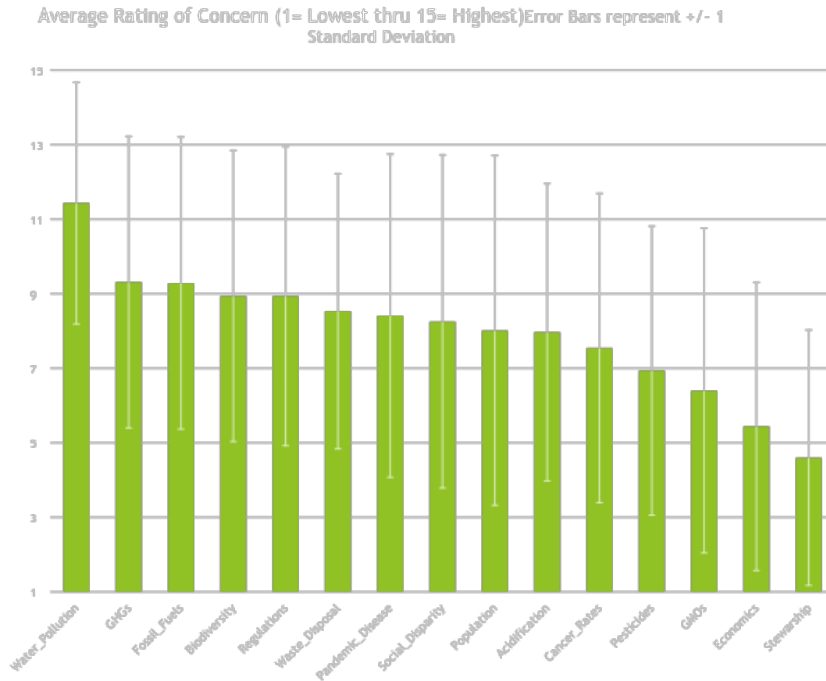


Table 17. Rating Areas of Concern Total Sample N=733

Concern	Mean	STD
Water Pollution	11.4325	3.2433
GHGs	9.3111	3.91283
Fossil Fuels	9.2865	3.92063
Biodiversity	8.9386	3.90639
Regulations	8.9359	4.01432
Waste Disposal	8.5293	3.69067
Pandemic Disease	8.4093	4.33804
Social Disparity	8.2551	4.46897
Population	8.0164	4.69417
Acidification	7.9673	3.99029
Cancer Rates	7.5416	4.14788
Pesticides	6.9359	3.87827
GMOs	6.4025	4.35706
Economics	5.4379	3.86812
Stewardship	4.6003	3.4276

Mean scores of the total sample for areas of concern ranged from a mean value of 11.43 for Water Pollution down to a low of 4.6 for Stewardship.

Figure 4. Rating Areas of Concern for Juniors and Seniors N=509

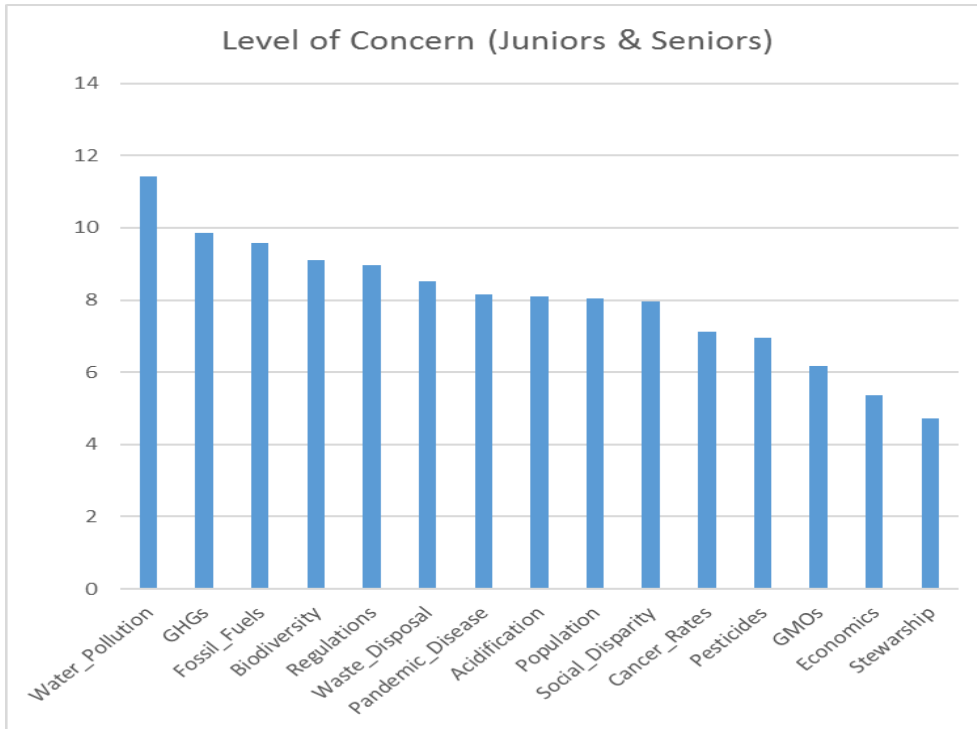


Table 18. Rating Areas of Concern for Juniors/Seniors N=509

	Mean	Std. Deviation
Water Pollution	11.4303	3.16439
GHGs	9.8566	3.72016
Fossil Fuels	9.5678	3.84567
Biodiversity	9.0982	3.89859
Regulations	8.9646	4.00673
Waste Disposal	8.5049	3.67403
Pandemic Disease	8.165	4.36705
Acidification	8.0963	3.92907
Population	8.0452	4.71093
Social Disparity	7.9725	4.43359
Cancer Rates	7.1238	4.10617
Pesticides	6.9411	3.80536
GMOs	6.1631	4.38489
Economics	5.3517	3.88315
Stewardship	4.7191	3.45295

Scores of the Junior/Senior sample for areas of concern ranged from a mean value of 11.43 for Water Pollution down to a low of 4.72 for Stewardship. The fact that concerns like water pollution and emissions of greenhouse gases rate highly, while economics and stewardship rank at the bottom, may reflect differing attitudes towards problems with potential technical solutions (such as reducing carbon dioxide emissions, for example), as opposed to concerns with a more ethical dimension, such as stewardship. Concerns such as economics and stewardship, as sociological phenomena, may not easily lend themselves to a technical "fix" as might reducing pollution.

BEHAVIOR



Following from knowledge and attitudes, aspects of behavior were the third principal aim of our assessment survey. Patterns of behavior, including what resources are consumed as well as wastes generated, are potentially the most revealing metric for investigating sustainable practices on campus and elsewhere. Underscoring the importance of behavior patterns is the reality that the aggregate actions of all of us collectively have a major impact on the quality of life on the Earth, for better or for worse. The behaviors section assesses self-reported actions students are taking on issues of sustainability. Students were also asked about their levels of civic engagement and participation in campus sustainability events.

Sustainability and Civic Engagement Events

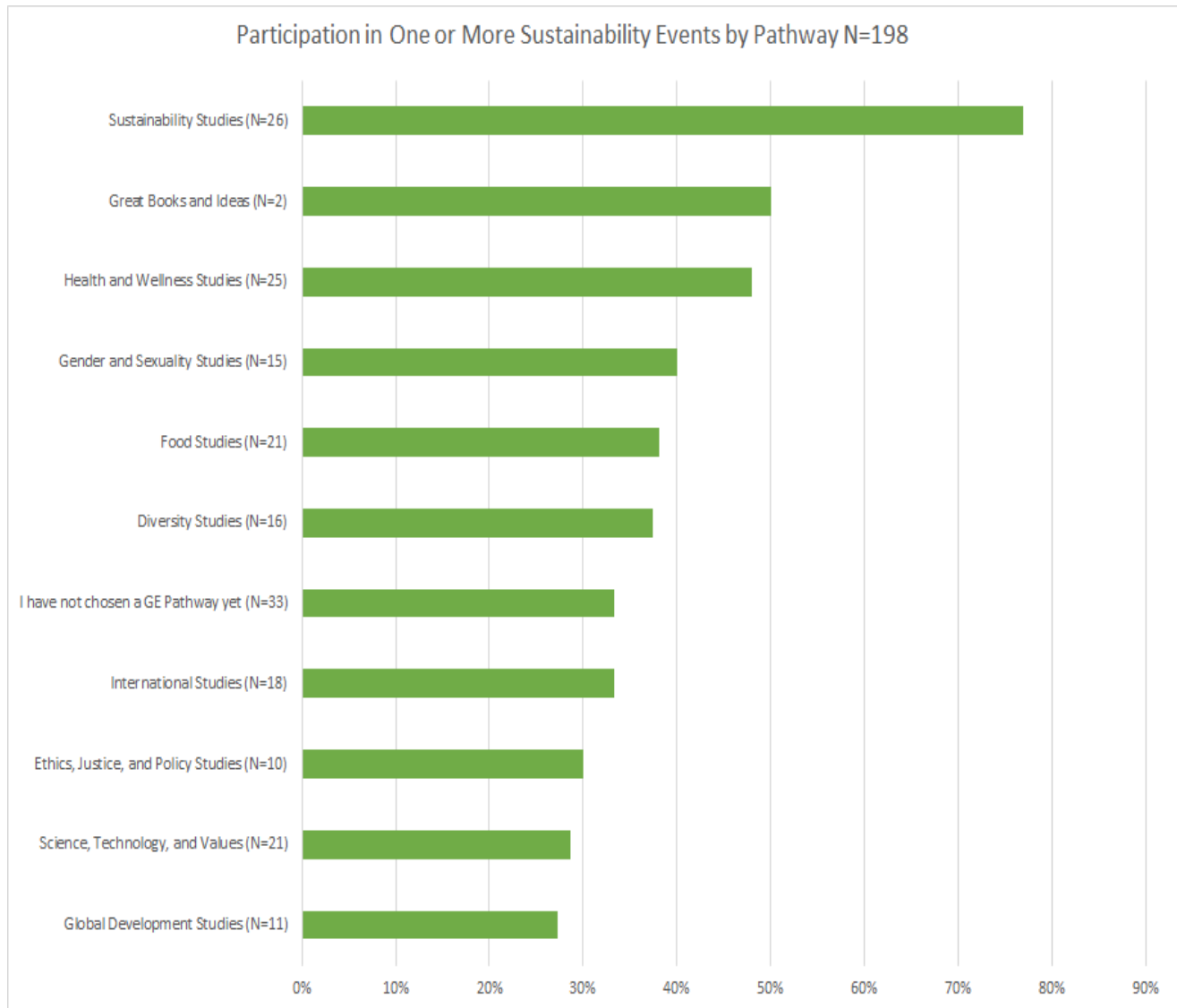
Sustainability Events	Civic Engagement Events
This Way to Sustainability Conference	Town Hall
Sense of Place Exhibit	Great Debate
Earth Week events	
Arbor Day Tree Planting	
Diversion Excursion	
Chico Gets Out / Outdoor Campus Challenge	
Wildcat Sustainability Showdown Campus Conservation Nationals	

Table 19. Participation in Sustainability Events of Total Sample (N=733).

Number of Events	Frequency	Percent (%)
0	519	70.8
1	160	21.8
2	35	4.8
3	12	1.6
4	4	0.5
5	3	0.4
Total	733	100.0

In this study, approximately 30 percent of students participated in at least one campus sustainability event and 40 percent participated in Town Hall and/or Great Debate.

Figure 5. Percent Participation in One or More Sustainability Events by Pathway, N=198



Students who participated in one or more sustainability events differed by pathway ($p < .05$).

Juniors and seniors were more likely to participate in one or more events ($p < .05$).

No significant differences in participation rates were revealed for participation in sustainability events according to gender, Pell-eligible students, or first-generation students.

There was no significant difference between participation in civic engagement events (Town Hall and Great Debate) by gender, Pell-eligible students, first-generation students, class rank, or pathway.

Table 20. Number of Sustainability Events Compared with Civil Engagement Events

		Civic Engagement (Town Hall & Great Debate)			
		.00	1.00	2.00	
Sustainability Events	0.00	330	111	78	
		76.2%	67.7%	57.4%	
	1.00	81	41	38	
		18.7%	25.0%	27.9%	
	2.00	13	9	13	
		3.0%	5.5%	9.6%	
	3.00	8	1	3	
		1.8%	.6%	2.2%	
	4.00	1	0	3	
		0.2%	0.0%	2.2%	
	5.00	0	2	1	
		0.0%	1.2%	0.7%	
	Total		433	164	136

Students who participated in one or more campus civic engagement events (Town Hall and/or Great Debate) were more likely to participate in campus sustainability events ($p < .01$).

Table 21. Sustainability Knowledge and Number of Civic Engagement Events

Civic Engagement Events	Mean Score (Knowledge)	N
0	7.02	433
1	6.44	164
2	7.29*	136
Total	6.94	733

Students who participated in two or more civic engagement events (Town Hall and/or Great Debate) scored higher on knowledge than non-participants ($p < .01$).

Table 22. Sustainability Knowledge and Number of Sustainability Events

Environmental Actions	Mean Score Knowledge	N
0	6.75	519
1	7.31	160
2	7.57	35
3	7.08	12
4	9.25	4
5	9.00	3
Total	6.94	733

Students who participated in campus sustainability events scored higher in sustainability knowledge than non-participants ($p < .01$).

Sustainable Behaviors

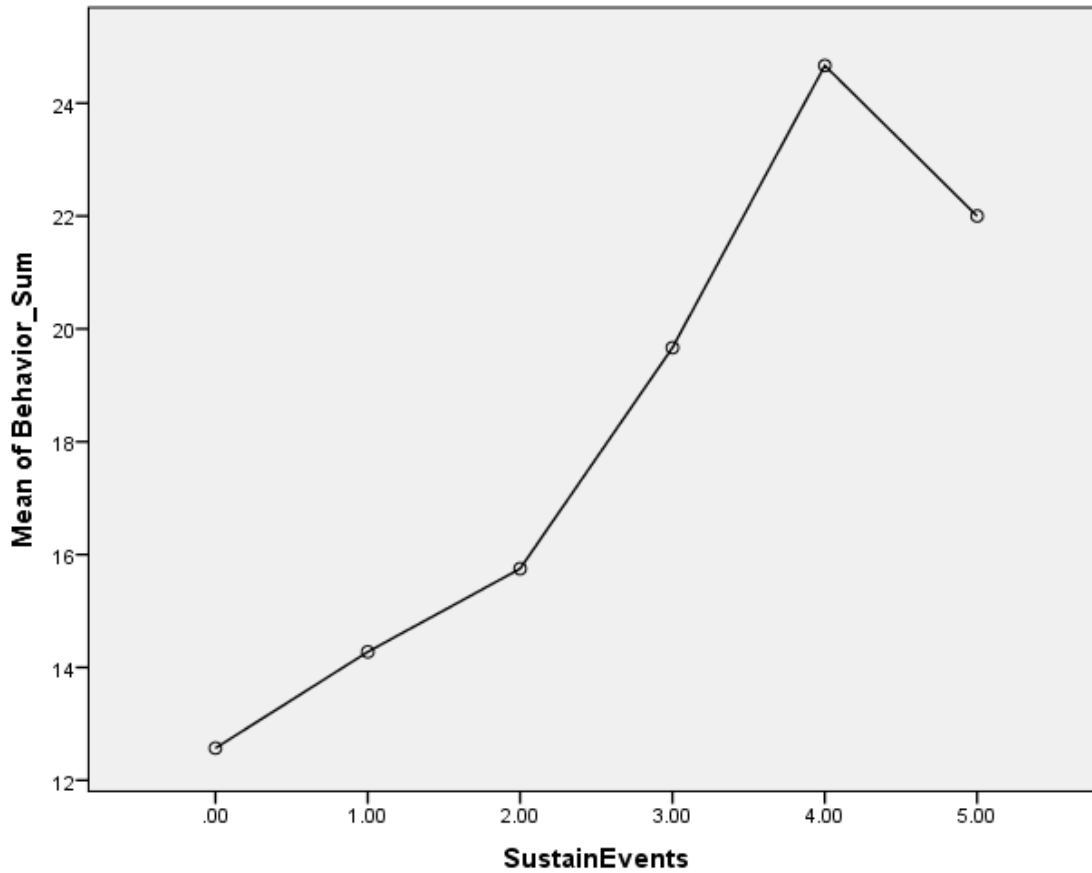
Table 23. Mean Scores of Sustainable Behaviors (N=733)

7-point Likert Scale -3 Strongly Disagree to +3 Strongly Agree

Sustainable Behaviors	Mean	Std. Dev.
I try to buy food in bulk and/or use a refillable water bottle to reduce waste.	1.92	1.202
I turn down the thermostat when not home and when I go to bed each night.	1.81	1.54
I try to reduce the amount of printing I do in order to save paper.	1.66	1.442
I know which items are recyclable and I make sure the correct items get recycled in my home.	1.47	1.396
I often engage in conversations with people who have a different perspective.	1.44	1.333
I make sure household chores in my home are equally shared among family members.	1.13	1.445
I actively look for ways to reduce the amount of waste I personally produce.	1.04	1.408
I use alternative transportation (bus, walk, bike, train) rather than drive whenever possible.	0.81	1.975
I power off my computer when not in use.	0.71	2.055
I consciously purchase goods produced from socially and environmentally responsible companies.	0.38	1.528
I always choose a product that has the least impact and longest life cycle.	0.24	1.45

Students were more likely to report efforts to reduce waste, control the thermostat, reduce printing, and recycle as examples of sustainable practices. Students were less likely to use alternative transportation, turn off computer when not in use, choose goods from environmentally responsible companies and practice consumer awareness about the impact or life cycle of purchases.

Figure 6. Student Participation in Sustainability Events and Summative Behavior Scores



Students participating in a greater number of sustainability events had higher summative behavior scores than non-participants ($p < .05$).

SUMMARY

Based on the results of this assessment:

Knowledge

- There was a significant pairwise difference between the knowledge scores in Sustainability Studies and all pathways except Global Development, Great Books, Science, Technology, and Values, and International Studies.
- Knowledge scores improved by grade level.
- Knowledge scores varied significantly according to ethnicity for both the total sample and Juniors/Seniors only.
- First-generation students scored significantly lower on knowledge questions than non-first generation students.
- Pell-eligible students scored significantly lower on knowledge questions than not Pell-eligible students.
- For the total sample, men scored significantly higher on knowledge questions than women.

Attitudes

- In descending order, students ranked fresh water pollution as their highest area of concern, followed by concern over rising levels of atmospheric GHGs, continued energy dependency on fossil fuels, and protection of biodiversity and environmentally sensitive landscapes. Students ranked stewardship of public lands, the shifting state of national global economics, and genetically modified organisms (GMOs) in the food supply as the 3 lowest levels of concern.

Behavior

- Students participating in one or more sustainability events varied according to pathway.
- Juniors and seniors were more likely to participate in one or more sustainability events.
- There was no significant variation in participation rates in sustainability events according to gender, Pell-eligible students, or first-generation students.
- There was no significant variation in participation rates in civic engagement events (Town Hall and Great Debate) according to gender, Pell-eligible students, first-generation students, class rank, or pathway.
- Students who participated in one or more campus civic engagement events (Town Hall and Great Debate) were more likely to participate in campus sustainability events.
- Students who participated in both (Town Hall and/or Great Debate) scored significantly higher on knowledge on sustainability topics than students who attended one or none.
- Students who participated in campus sustainability events also scored higher in this knowledge and mean knowledge scores increased with more participation
- There was a significant relationship observed for students participating in a greater number of sustainability events having higher summative behavior scores

CONCLUSIONS

By raising awareness of sustainable practices and by providing opportunities to participate in them, universities can be powerful agents of change with a far-reaching impact.

With knowledge of sustainability concepts becoming increasingly central to institution-wide learning objectives, there is a growing demand for a way to measure progress in this area. Our assessment tool can easily be used (via a campus-wide survey or distributed at the classroom level) to gauge current levels of knowledge and track changes over time, as well as assess the effectiveness of courses and curricula at meeting sustainability knowledge goals. In order to make this happen, we need better representation across the pathways in our surveys.

The fact that the Sustainability Studies pathway students had the highest knowledge scores, as well as greater participation in sustainability events when compared to several other pathways, underscores the importance of creating well-defined learning outcomes in courses with the Sustainability SLO that directly link the material to sustainability knowledge, attitudes, and practices.

This study shows a gap among Pell-eligible, first generation, and underrepresented minorities students for sustainability knowledge. This suggests that the sustainability curriculum is not serving these students as well as it could be. As educators, we need to do more to understand how best to teach and assess sustainability for a diverse student population. Strengthening the connection between the three components of sustainability – social justice, economic feasibility, and environment – should be stressed.

Our study reveals an important trend that students who scored higher on knowledge attended more sustainability and civic engagement events. Moreover, participation in sustainability events is correlated with an increase in self-reporting of sustainability behaviors. Given that CSU, Chico has many sustainability-linked [events and programs](#), there are opportunities for GE courses/pathways/instructors to engage students with these high impact learning practices and assist students in pursuing their college experience in intentionally connected ways.

Freshwater pollution was ranked the top area of concern for students. This could be interpreted as an effect of the recent state-wide drought and legislation regarding water rights. The results of this survey may help instructors build on students' current interests to encourage their engagement with sustainability.