California State University Monterey Bay

Sustainability Literacy

Interim Report, Spring 2017

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Purpose

We initiated a sustainability literacy study at CSUMB in the spring semester of 2017 with the purposes of:

- Understanding students' knowledge and perceptions of sustainability across majors at CSUMB
- Evaluating differences across majors, years at CSUMB, and exposure to co-curricular activities
- Learning if specific courses or campus programs influence students' knowledge and interest in sustainability
- Learning about students' priorities and interest in sustainability on campus – via curricular, co-curricular, and infrastructure improvements.

Approach

We utilized an existing sustainability literacy test from Sulitest.org, which is used by universities around the world to evaluate students' knowledge about sustainability in a range of measures. We also developed a short survey about CSUMB sustainability – including questions about exposure to sustainability through courses, co-curricular programs, and campus infrastructure. We also invited students to participate in a focus group to discuss their perceptions of sustainability, the Sulitest questions, and campus sustainability.

To obtain access to students, we asked faculty from A4 General Education courses across campus to participate in the study. A total of 12 courses across 9 departments agreed to participate. In early February, we introduced the study in one class and obtained student consent to participate. A total of 176 out of 294 students (60%) agreed to participate from these courses. Two to three weeks later, we administered the test and survey in-class and held the focus group at the conclusion of the test administration. On the days administered, a total of 107 students (36%) participated in the test and survey, and 4 participated in the focus group. We believe this attrition was due in part to the timing of the test administration, as students had reached a higher workload/curricular demand by the end of February. Some students also began to take the test but did not complete it because it was "too hard" or "too long."

Analysis

Test scores were provided by Sulitest.org. Results were statistically analyzed by comparing test results to students' major of study, academic year of study, and if students had learned about sustainability at CSUMB in their courses or co-curricular activities. Qualitative responses were also thematically grouped and analyzed. We asked students their majors to confirm that students enrolled College of Science (COS) courses were COS majors and similarly, that non-COS majors were enrolled in non-COS courses. However, because of small samples among some majors, we analyzed results based on cohorts of COS or non-COS majors. Our sampling focused on courses that primarily enroll Juniors and Seniors; however, we had one course (ENSTU 211) that included first year and sophomores. With these results, we were able to compare freshman to senior performance on the Sulitest. However, the ENSTU 211 sample were excluded from other statistical analyses.

Results

Comprehensive results are attached by method and mode of analysis in the appendices to this report. Overall, we found the following:

- CSUMB students performed similarly to other campuses in the United States and worse than students from campuses in other countries.
- CSUMB students who had taken a course that taught sustainability performed better on the test. This was true for students in COS and non-COS majors. No matter what the student's major, 95% of students listed that a COS course had influenced their sustainability literacy.
- CSUMB students enrolled in College of Science courses showed a higher average score on the Sulitest than those in a non-COS course. There was an estimated difference of 21.4 points with a 95% Confidence Interval (3.9, 38.9) and p-value of 0.009.
- Seniors had higher average scores than first year students. However, there was no statistical relationship between test performance and number of years at CSUMB. (Transfer students performed equally well on average when compared to students who spent their first and second years at CSUMB.)
- There was a positive association between exposure to co-curricular programs (clubs, guest speakers, etc.) and performance on the Sulitest.
- Across majors, taking the test influenced students thinking about sustainability. Students identified that the test provided them with a broader understanding of sustainability after the survey, that they learned specific content knowledge, or learned about specific actions to increase sustainability at individual or policy levels.
- In response to participating in the study, 33% of students wanted to see more curricular integration, across all majors, and 26% wanted infrastructure improvements on campus.

Next Steps

We will continue this study in the coming 4 years, to evaluate sustainability on campus over time and gather a larger pool of participants. We will revise our delivery of the test to increase participation, since we lost a number of participants between the consent day and the survey day. While the focus group led to interesting discussions about sustainability, we do not intend to continue it beyond the 2017 year as it less directly supports our understanding about students' sustainability literacy.

Report (Updated on 04/26/2017)

This report addresses the following objectives.

Objective 1: The primary objective of this pilot study is to explore whether there are potential association between:

a. Total score and taking any course(s) related to sustainability at CSUMB

b. Total score and the level of exposure to sustainability on campus other than course(s) such as student groups, other students, friends, faculty, campus professionals and guest speakers

c. Total score and academic year

d. Total score and COS-courses (versus non-COS courses)

e. Total score and years at CSUMB conditioning on academic year (Junior and Senior only)

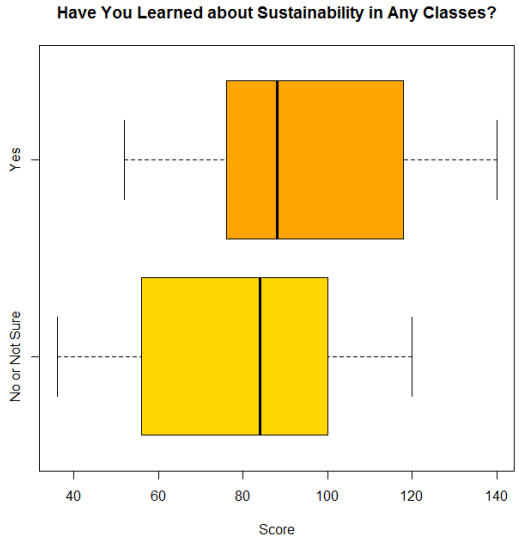
Objective 2: In addition, to account for confounding factors, we estimate the average difference in the score by adjusting the above factors in a statistical model.

Note: Too small subgroups are combined or eliminated in the analysis.

Note: We are *not* confirming any hypotheses in this report. We generate hypotheses and/or check our intuition.

Report on Objective 1a:

	No	Not Sure	Yes	Overall
N surveyed	30	10	59	99
N with complete information and score	14	3	32	49
KnowledgeGlobal	1.54	1.42	1.87	1.74
KnowledgeRole	2.00	2.67	2.33	2.26
KnowledgeHumanityEcosystem	1.55	1.14	1.76	1.66
KnowledgeTransition	1.45	1.58	1.78	1.68
PersonalSkills	2.29	1.33	2.38	2.29
ThinkSystematically	2.19	2.22	2.54	2.42
WorkingWithOthers	2.57	1.33	3.50	3.10
Total Score	79.71	73.33	94.66	89.08



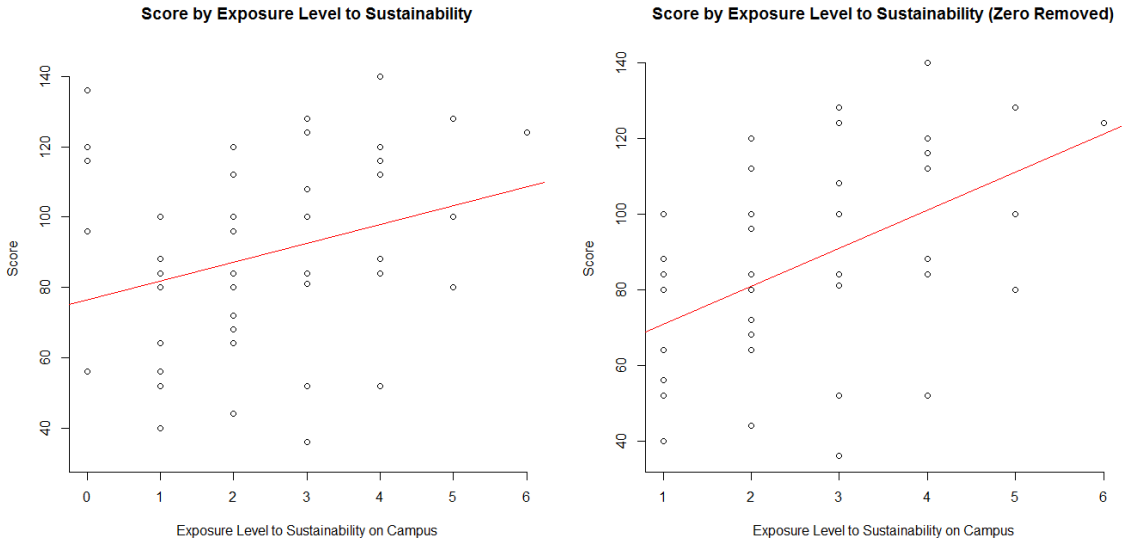
Due to the too small subgroup size of "Not Sure," we considered combining "Not Sure" with "No." The estimated difference in the average score is 16.1 with 95% CI (-0.7, 32.8) with p-value 0.030.

Report on Objective 1b:

In the survey, students were asked "Where else have you learned about sustainability on campus?" To gain statistical efficiency, we quantified the exposure level to sustainability by counting the number of positive responses in the below:

- Student groups
- Other students
- Friends
- Faculty
- Campus professionals
- Guest speakers

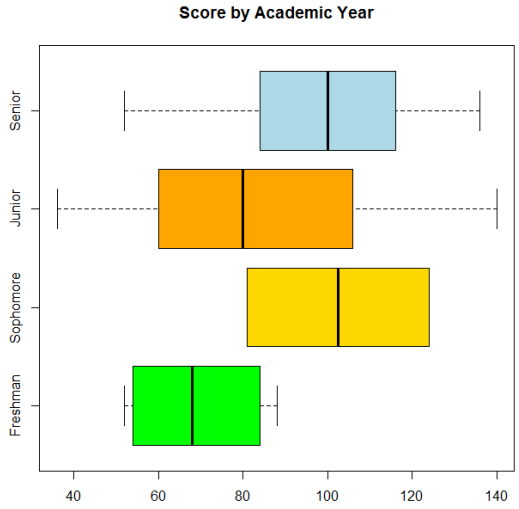
Exposure level	0	1	2	3	4	5	6	Total
Counts	5	11	12	8	9	3	1	49

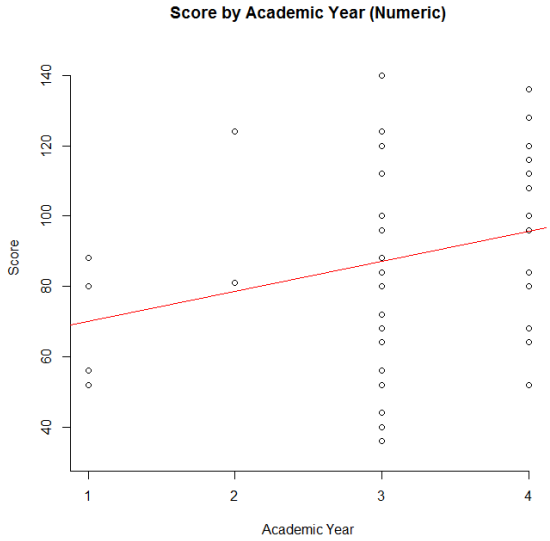


Under the simple linear regression (the left panel of the figure above), we gained statistical evidence for a positive association between the exposure level and the score (p-value = .021). An estimated slope was 5.364 which is interpreted as the difference in the average score associated with one exposure level difference. When we compared "0" versus "≥ 1," we obtained a lack of evidence for the difference (p-value 0.280). After removing "0," an estimated slope was 10.0 (the right panel of the figure above).

Report on Objective 1c:

	Freshman	Sophomore	Junior	Senior	Overall
N surveyed	9	3	54	28	94
N with complete information and score	4	2	23	18	47
KnowledgeGlobal	1.56	2.12	1.58	1.96	1.74
KnowledgeRole	1.33	2.67	1.97	2.74	2.24
KnowledgeHumanityEcosystem	1.21	1.89	1.58	1.83	1.66
KnowledgeTransition	1.00	1.27	1.75	1.68	1.64
PersonalSkills	2.00	4.00	2.09	2.44	2.30
ThinkSystematically	2.33	4.00	2.20	2.59	2.44
WorkingWithOthers	3.00	4.00	2.26	4.00	3.06
Total Score	69.00	102.5	83.48	97.78	88.53



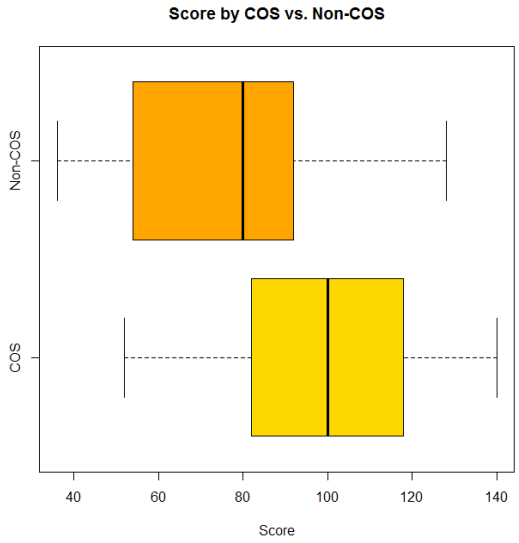


There were too few freshman and sophomore with the complete information and score. When we applied the ANOVA test (four groups), we could not detect the difference in the average score by academic year (p-value 0.166). To borrow statistical efficiency in the linear model, we assigned numeric values (years) to each academic level. In this alternative analysis, we could obtain statistical evidence for a positive association between the academic year and the score (p-value = .038). An estimated slope is 8.5 which is interpreted as the difference in the average score associated with one year difference in the academic year (assuming the linear trend).

When we compared Freshman and Senior only (i.e. two groups), an estimated difference in the average score was 28.8 with 95% CI (2.8, 54.7) and p-value 0.018.

Report on Objective 1d:

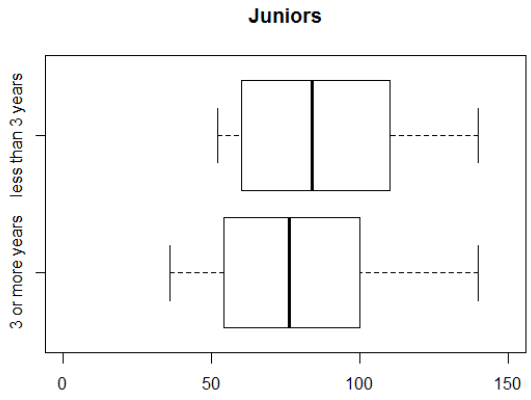
	BIO 300	BUS 304	CHHS	ENSTU 211	ENSTU 400/403	ENVS 300	GS 362	HCOM	LS 300	Overall
COS Categorization	COS	Non-COS	Non-COS	--	COS	COS	Non-COS	Non-COS	Non-COS	
N surveyed	19	7	6	11	8	15	14	3	16	99
N with complete information and score	17	2	3	6	6	4	3	2	6	49
KnowledgeGlobal	1.87	1.62	1.08	1.75	2.04	2.06	2.00	1.62	1.17	1.74
KnowledgeRole	2.43	2.67	0.89	2.00	2.67	3.00	1.78	2.67	1.78	2.26
KnowledgeHumanityEcosystem	1.83	1.29	0.76	1.57	1.71	2.29	1.62	1.89	1.33	1.66
KnowledgeTransition	1.67	2.18	1.09	1.39	1.70	2.18	2.30	2.00	1.33	1.68
PersonalSkills	2.35	2.00	1.33	2.67	1.33	3.00	2.67	2.00	2.67	2.29
ThinkSystematically	2.59	3.33	1.78	2.89	2.00	3.00	2.22	2.67	1.56	2.42
WorkingWithOthers	3.29	2.00	0.00	3.33	4.00	4.00	4.00	4.00	2.00	3.10
Total Score	94.59	90.00	49.33	86.00	94.67	114.00	98.67	96.50	66.67	89.08

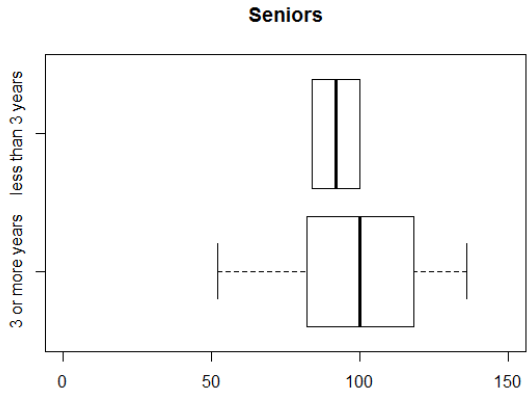


For comparing COS courses to the Non-COS courses (see the Table above for the categorization), we focused on 300- and 400-level courses only (removed ENSTU 211). In this comparison, it was statistically evident that the COS courses showed a greater average score. An estimated difference was 21.4 with 95% CI (3.9, 38.9) and p-value 0.009.

Report on Objective 1e:

	Junior (≥ 3 years)	Junior (< 3 years)	Senior (≥ 3 years)	Senior (< 3 years)	Overall
N surveyed	30	24	7	21	82
N with complete information and score	12	11	16	2	41
KnowledgeGlobal	1.52	1.64	1.95	2.00	1.74
KnowledgeRole	1.78	2.18	2.83	2.00	2.31
KnowledgeHumanityEcosystem	1.50	1.66	1.82	1.86	1.69
KnowledgeTransition	1.85	1.65	1.70	1.45	1.72
PersonalSkills	1.33	2.91	2.50	2.00	2.24
ThinkSystematically	1.56	2.91	2.67	2.00	2.37
WorkingWithOthers	2.33	2.18	4.00	4.00	3.02
Total Score	79.33	88.00	98.50	92.00	89.76





We could not obtain statistically significant difference when we compare "≥ 3 years at CSUMB" versus "< 3 years at CSUMB" conditioning on the academic level (Junior or Senior only). The p-value is .626.

Focusing on Junior only, when we compare "≥ 1 years at CSUMB" versus "< 1 years at CSUMB," we could not obtain statistically significant difference either. The p-value is .664.

Report on Objective 2:

To account for inter-correlation among the factors considered above, we used an adjusted linear regression to estimate the difference in the average score. Due to multiple factors with sparse data, we could not achieve any statistical significance for difference in the adjusted analysis, but the directions of resulting estimates supported our intuition. In this analysis, freshman and sophomore were removed, and 41 subjects contributed to the following estimates.

- We estimated that students who have taken at least one course related to sustainability showed 7.2 higher score on average than students responded "No" or "Not Sure."

- We estimated that students in COS courses have 15.1 higher score on average than students in non-COS courses.

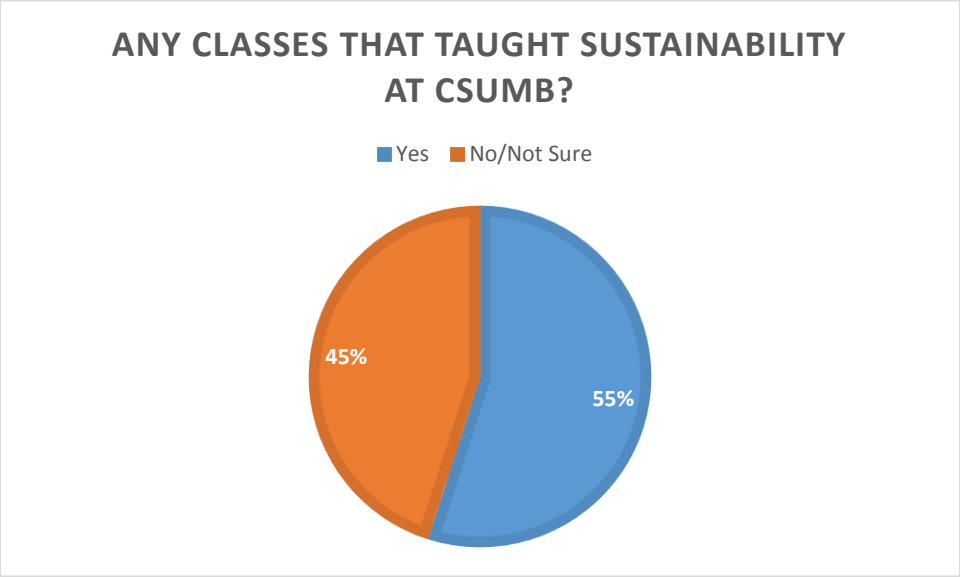
- We estimated that senior students have 1.4 higher score on average than junior students.

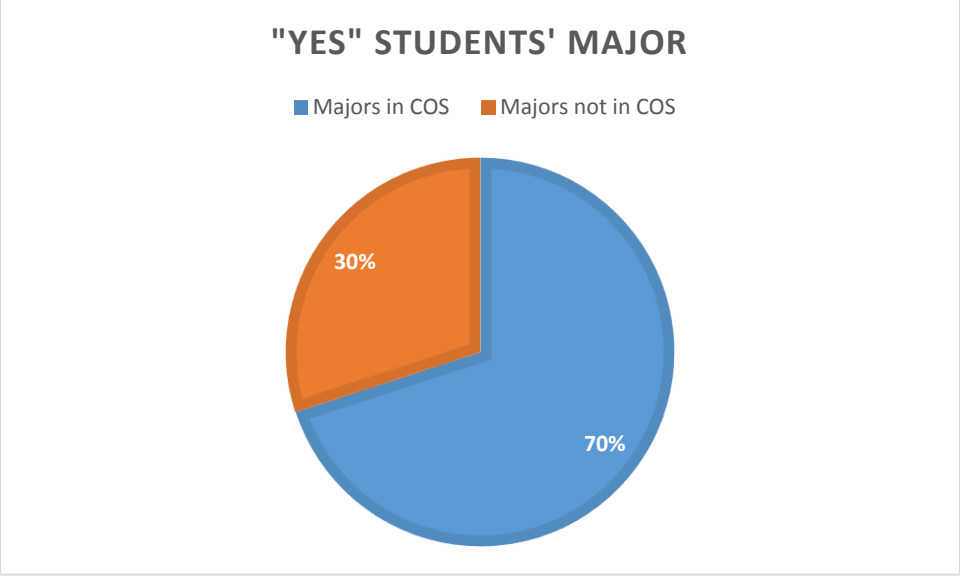
- We estimated that the difference in the average score associated with one exposure level difference is 3.8.

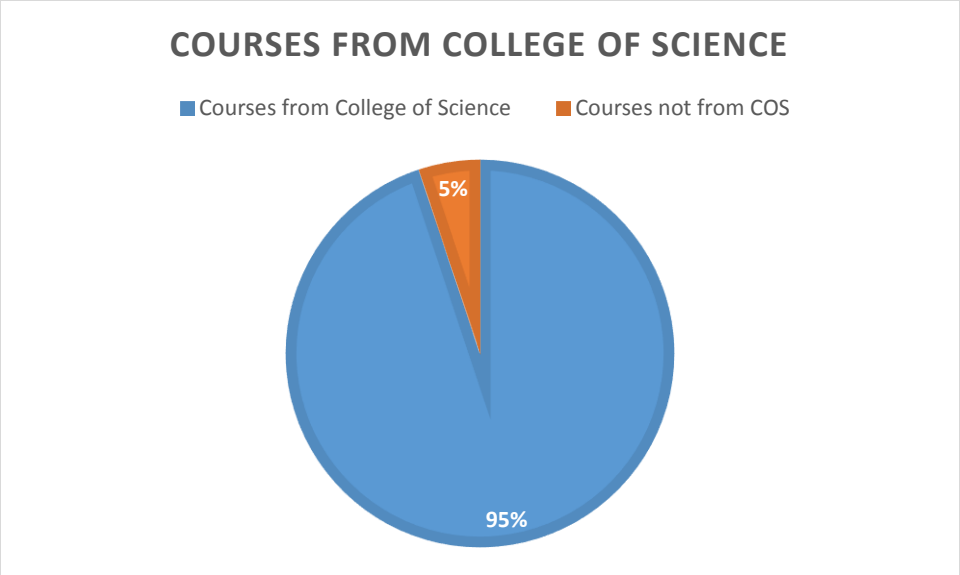
Question 1 Responses

Have you learned about sustainability in any classes at CSUMB? If yes, which classes? (N=95)

A total of 50 students (55%) said that specific classes had taught them about sustainability. Of the students who replied "yes" they had learned about sustainability in CSUMB courses, 70% were from College of Science, and 30% were from a non-COS major or department. Of the courses students identified, the majority listed (95%) were from the College of Science. However, these courses represented a wide range of departments and subjects, including Biology, Marine Science, Environmental Science, Environmental Studies, and included topics of science, agriculture, policy, writing, individual behaviors, social justice, and service learning.



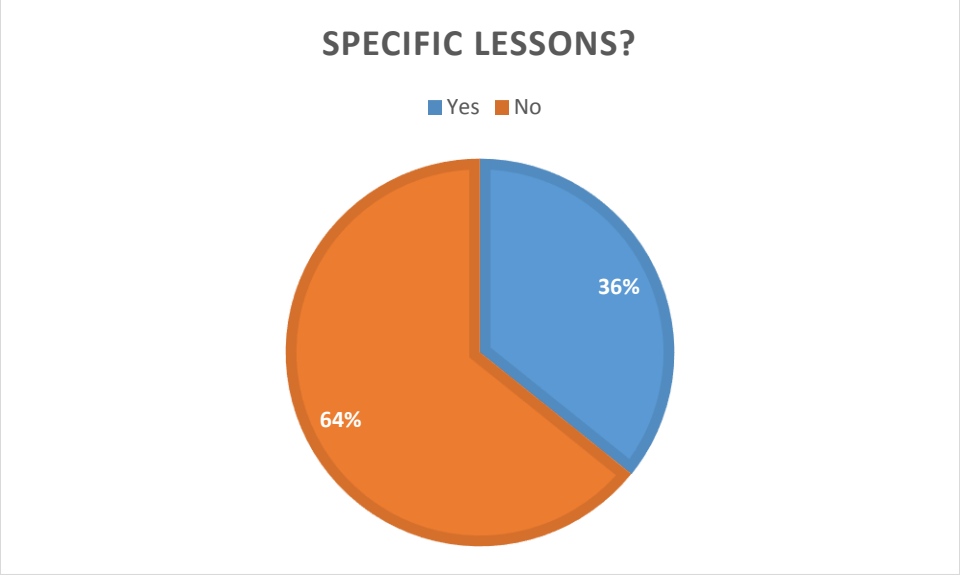




Question 2 Responses

Were there any lessons that helped you understand sustainability? If so, please list them here. (N=95)

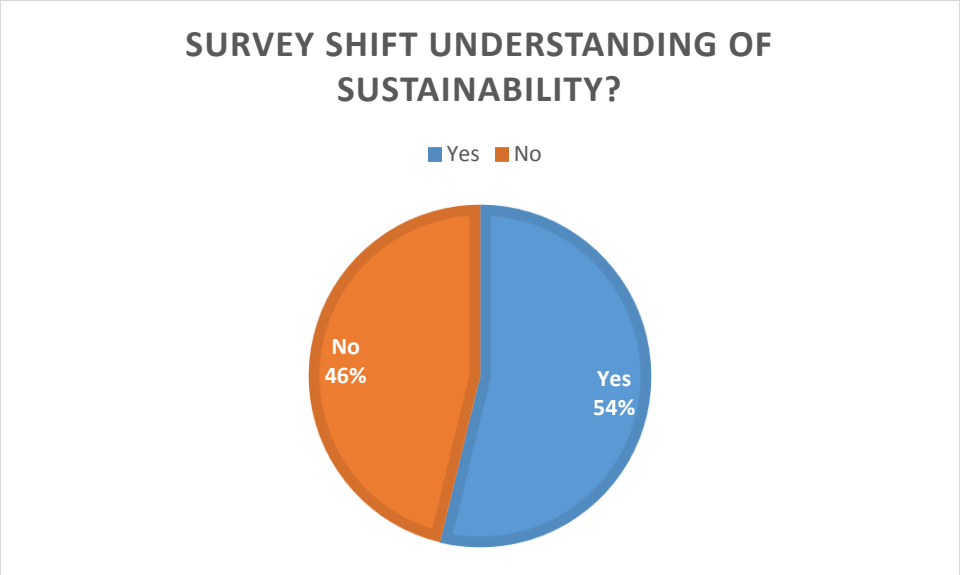
Thirty-four students (36%) identified specific lessons that had helped them understand sustainability. These lessons spanned a wide range of topics, with resource use/conservation and carbon footprints being mentioned most often. Of those who did not name a specific lesson, some said that the entire class was focused on sustainability, while others said that no lesson stood out or that this was not applicable to them.



Question 4 Responses

Did the questions on the on-line survey you just completed change what you understand sustainability to mean in any way? If so, how? (N=93)

A total of 50 students (54%) replied that "yes," the survey changed their understanding of sustainability in some way. These students spanned many majors, including those in the College of Sciences (Biology, Environmental Science, and Environmental Studies), Global Studies, Business, Liberal Studies, HCOM, and CHHS. Reasons varied, from those who realized they had more to learn generally, to those who identified having a broader understanding of sustainability after the survey, learning specific content knowledge, or learning about specific actions at individual or policy levels.



Knowledge Domain	Number of Responses	Sample Quotes
More that I have to learn	8	"I clearly didn't know as much as I thought I did." (Business) "I got a lot of answers wrong. I don't know a lot of statistics, I just have been taught what I can do at home to live sustainability." (Environmental Studies) "I don't think I realized much is known, and I feel like I've gotten a better understanding about how global it is." (Global Studies) "I wasn't really aware of most of the stuff on the test, so taking it and seeing the correct answers was very eye opening." (Liberal Studies)

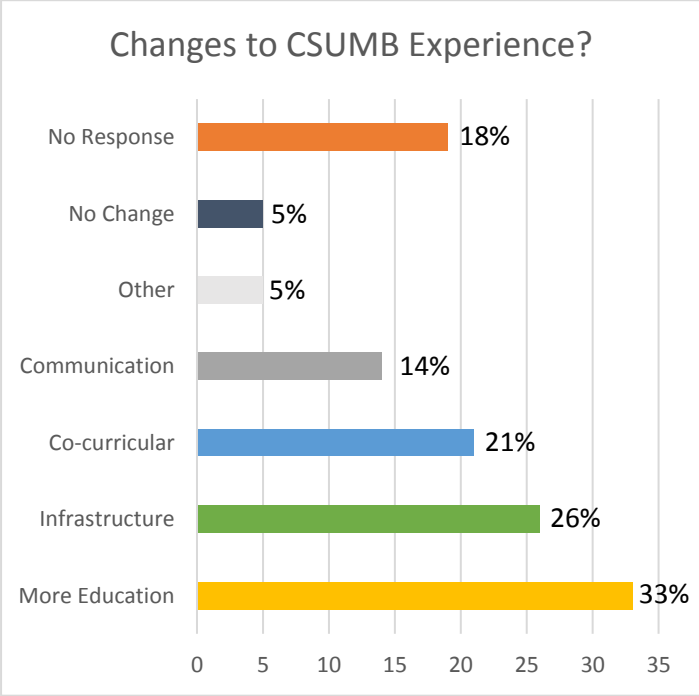
Sustainability is broader/more inclusive I thought or knew	11	"Sustainability does not just encompass the natural world, it also includes socio-economic views." (Biology) "Mainly they broadened the interrelation of economics, the environment and how people and animals consume and treat the environment. Also, I learned more about how laws and regulations play a large role in being more sustainable." (CHHS) "I've never applied it to culture or languages." (ENVS) "This experience has got me thinking about sustainability in terms of social equity and economics." (HCOM) "There was this question relating to poverty levels and I didn't know that sustainability had to do with any of that. I had always thought that sustainability involved being green and stuff." (Liberal Studies)
Increased specific content knowledge	17	"I had no idea that GDP would decrease if nothing's done." (Biology) "There's a lot of information that I didn't know about climate change." (CHHS)
Increased knowledge about actions – from individual to policy	7	"Made me aware of the many efforts in place and taking place to improve sustainability globally." (Business) "A lot of people have to be involved to make a change globally." (Biology) "It made me more interested in the matter and want to participate and help." (Global Studies)

Question 5 Responses

When you consider the broad framing of sustainability as in the survey you just took, what would you like to see more of in your CSUMB experience? N=107

Students said they would like to see more education (33%), infrastructure improvements (26%), and co-curricular changes (21%) that focus on sustainability improvements after taking the test. Of these groupings, students specifically mentioned increased education about social justice disparities as part of sustainability (7%) for education, and changes to the campus food (7%) for infrastructure.

Category	Number of Surveys (n=107)
More Education	35
Sub-category: social justice and global disparities as part of sustainability education	7 of 35
Infrastructure	28
Sub-category: food	8 of 28
Co-Curricular (Activities, clubs, learning outside the classroom)	22
More communication	15
No changes – good as is	5
Outside speakers/professionals	4
Support from administration	1
No Response	21



Category	Number of Responses	Sample Quotes
More Education	35	I would like teachers or guests to explain what is sustainability and how can I make a contribution towards sustainability (Liberal Studies) <u>Mostly</u> education. People don't really know much about sustainability yet we pride ourselves on being a "Green Campus." (Liberal Studies) I would like to see more direct education about sustainability rather than a brief overview in classes (ENVS) More hands on sustainability classes (ENVS)

		A class on economics and sustainability (Biology) More activities/info sessions/classes about the topic. Besides the BIO/MSCI/ENVS major, I do not think other students would know much (Biology) An easily accessible approach to sustainability education. The survey was not a survey at all, but a means to inform the participant. However, the material presented was much to technical and specific to be retained. (Global Studies) I would like to see a greater emphasis on sustainability in a wide range of classes and on campus (Global Studies) Support for sustainability in all majors (Global Studies) The spread of knowledge outside the classroom, and in more classes that are not directly about the environment (ENSTU 211) Classes about policy for sustainability in the professions (Biology)
More Education Sub-category: Social Justice and Global Impacts	7	More classes built just around sustainability on both a global and individual scale (Biology) I would like a larger array of individuals to be taught about sustainability and how it impacts the entire world (ENVS) More information to students about "grim realities" in our world, especially those regarding 3rd world economic disparity (Liberal Studies) International statistics and efforts (Business)
Infrastructure	28	Solar panels, specific bins for unwanted food, water regulation, green transportation services (Liberal Studies) Facilitation for students who want to make a change, for example charging stations for electric cars, or a sustainable food section at the DC (ENVS) More sustainable development on land already taken up by abandoned Ord (ENVS)

		More bike paths to encourage students to ride instead of bike; more water fill stations in older buildings; composting food from food venues to be used in garden (ENVS) Ways to reduce waste caused by students whether it be water waste or food waste (ENVS) Zero food waste (at least minimize), local food, campus clean ups, bear (racoon)box trash cans = less trash in the streets, Ord (ENVS) More conservation (CHHS) Would like to see more events on campus. Would also like to see a compost section in the dining locations (HCOM) I'm not really sure what I'd like to see. I still don't feel like I know enough. Probably more solar panels. I think I would be hard to do more since our school is still growing and will probably be taking away from the forest. (Global Studies) Less unnecessary electricity usage (Global Studies) Sustainable buildings (Global Studies) More opportunities for students to get around campus without having to drive (ENSTU 400/403) Yes, better food service, fixing housing issues, live water pressure and wasting water, so it gets hot (ENSTU 211)
Infrastructure Sub-category: Food	8 of 28	Zero food waste (at least minimize), local food, campus clean ups, bear (racoon)box trash cans = less trash in the streets, Ord (ENVS) More on campus farming and farm research that would supply students food at a farmers market/farm stand (ENSTU 400/403) Healthier, tastier foods in the DC and OE on campus (ENSTU 211) Sustainable practices with trash, waste, composting (Biology)

Co-Curricular (Activities, clubs, learning outside the classroom)	22	I would like to see more cleanups on and near campus. There's a lot of trash and litter on the ground, so I think it would be beautiful if we had a group put together a campus clean-up. (Liberal Studies) We realized CSUMB is focused a lot on sustainability. I would like to see more about how we can help to implement it. (Business) I would like to see more student clubs and orgs make an effort to be more sustainable (ENVS) I'd like to see more incentives for being sustainable, more educational workshops about how to be more sustainable, and more access to sustainable products. (CHHS) Examples of sustainability we can do as students (CHHS) Every freshman should be required to take a class/session on recycling. I say this because I personally want to help but sometimes I don't even know if things can be recycled so I throw them away. Why aren't we taught this? (ENSTU 211) I would like more workshops and competitions dedicated toward finding, creating and implementing sustainability solutions (ENSTU 211)
More communication	15	More signage promoting sustainability (Business) I would like to see more posts around the school about sustainability and why it's important. Also, ideas on how we can make a difference and be more sustainable (Biology) I do not come across much of this information here at CSUMB, so more awareness would help (CHHS) I think that if we had a weekly email like "the Burns" that gave weekly/monthly tips with simple solutions about how to be more "green" it would help me realize how easy it can be to be more considerate about my carbon footprint. (Global Studies) More promotion of sustainability. I have no clue what is going on where, regards to sustainable action (Global Studies)

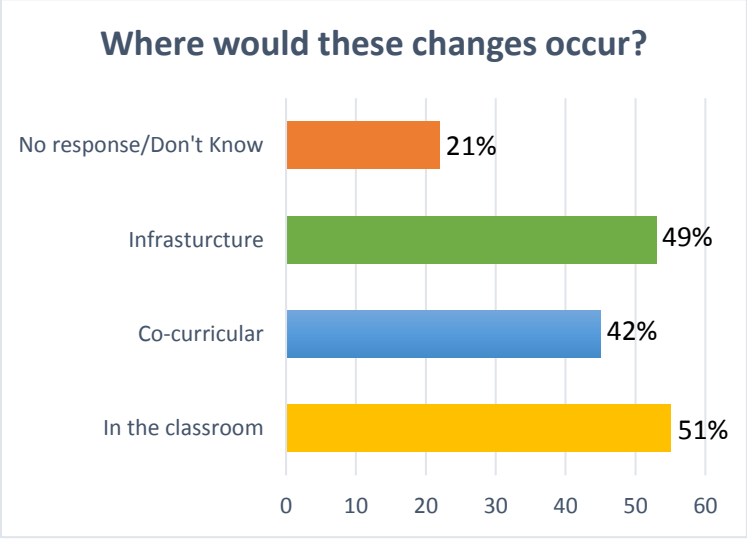
No changes – good as is	5	Our school's infrastructure in my opinion is already pretty "green" (Biology) I don't know I think we have a very good understanding of what sustainability is and CSUMB makes the knowledge available to us (Global Studies) I feel that my class intro to environmental politics is already helpful enough when it comes to understanding sustainability (ENSTU 211)
Outside speakers/professionals	4	Outside conversations for professional experience/jobs (ENSTU 400/403)
Support from administration	1	The school's infrastructure, the students work the hardest and there are many student groups and leaders on campus who are interested and concerned with sustainability (Liberal Studies)

Question 6 Responses

Would these changes be in the classroom, in university activities and clubs, in the school's infrastructure, or something different? (N=107)

Many students said they wanted to see changes in sustainability across multiple areas on campus, with 51% saying the classroom, 49% infrastructure, and 42% in co-curricular areas.

Response Category	Number of Responses
In the classroom	55
Infrastructure	53
Co-curricular	45
No response/Don't know	22



Response Category	Number of Responses	Sample Quote
In the classroom	55	These changes would be made in the classroom by teachers and if more guest speakers come to our classroom and discuss what it is and how I can contribute (Liberal Studies) A good place for it to start might be in FYS classes (Liberal Studies) Classroom. More service-learning opportunity focused classes (ENSTU 400/403) Classroom - require students to take sustainability courses (ENSTU 211)
Infrastructure	53	The school's infrastructure, the students work the hardest and there are many student groups and leaders on campus who are interested and concerned with sustainability (Liberal Studies) Mostly SODEXO would need to be more sustainable, use less plastic wrapping at the OE (HCOM) Infrastructure: support of zero waste in all offices (Global Studies) Create bike check-out stations where students can rent a bike from a self-check out area (ENSTU 400/403) Meal plans, we pay all this money for garbage food (ENSTU 211)
Co-curricular	45	In schools infrastructure initiated by groups and surveyed student demand (ENSTU 400/403)
No response/Don't know	22	

Many students also said that they wanted to see changes integrated across all areas of campus. These include:

I think they can be changes in all aspects of CSUMB: classroom, university activities, and clubs (Biology)

They would be in everything. For example, one thing I noticed was that the school created more speed bumps in order to reduce traffic and the amount of pollution that cars generate on campus.

However, they also bought a bunch of new police cars that are huge gas wasters. So they are striving for something, but not actually reprsenting that ideology. The focus on sustainability needs to come from the administration as well and should be represented in the budget allocations. (Business)

With great knowledge I can apply this everywhere. Plus it will be beneficial to everyone. (CHHS)

Focus Group Process

Four students participated in a photo-elicitation focus group. Students were asked to take a total of 10 pictures that represent i) social, ii) economic, and iii) environmental aspects of sustainability (3 each), and one that represented sustainability as a whole. Three students submitted photographs. These photographs were printed and displayed in a gallery setting. All focus group participants completed a gallery walk in which they reviewed the photographs, responded to specific questions, and then discussed the photographs. Photographs are presented in the appendix. One student submitted graphics that represent these concepts (not photographs), which are not included in the appendix but were hung in the gallery and were included in the discussion.

After the photo-elicitation discussion, students also discussed the survey they had taken and sustainability initiatives on campus.

Photo-Elicitation Results

Students saw that many of the photographs reflected aspect of nature – the beach, trees, plantings, ocean or sky. They reflected that these photographs in some way reflected how humanity interacts with the environment, through exchanges of money, directly with the environment, or people and other people.

In general the photographs evoked positive feelings among the participants, with students describing feelings of unity, "mutual and universal need for interaction," an "appreciate for the beautiful environment we live in," a "desire for change." Photographs of natural features evoked feelings of peace, happiness, and appreciation (Figures 1 and 2). One student commented that the photographs evoked "happiness that others care for the environment, too" and "a desire and motivation to make that important to as many people as I can. Nature preserving requires as much effort as we can manage." Students also responded positively to pictures that displayed people caring for or interacting with each other, such as two friends at a beach or a picture at a soup kitchen (Figures 3 and 4). One student took a photograph of a playground saying that it represented an economic investment in getting kids and families outside.

A few of the pictures evoked negative feelings or a "call to action." Photographs that evoked negative feelings included those that represent the "crazy development happening" along the coast and on the beach, where "all of a sudden there's all these houses" (Figures 5 and 6). Other images that evoked negative feelings included those that viewed the economy as money only rather than within

Figures 1 and 2. Photographs of nature, evoke feelings of happiness and peace

Figures 3 and 4. Photographs that represent social equity and evoked feelings of people being together and helping others

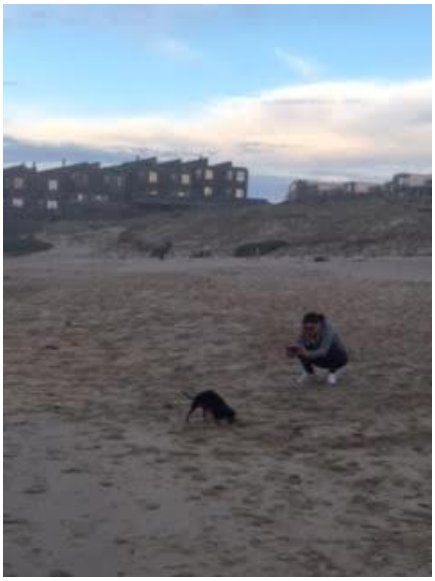
frameworks that promote a sustainable economy. Finally, a photograph of the dumpster evoked discussion about animals getting into the garbage, getting trapped, and creating litter.

Photographs that promoted feeling a "call to action" included those that showed coastal development and housing. Students wanted to take action against development) (Figures 5 and 6) and simultaneously want to promote "justice for all" (Figure 7) by providing more affordable housing options, for students. Students also discussed pictures that motivated them to think about future generations and integrating sustainability into work and school (Figure 8).

Figures 5, 6, and 7. Photographs that prompted a desire to take action. Figures 5 and 6 (left and center) were in response to coastal development and a lack of equity in housing. Figure 7 in general motivated students to think about justice and action.

Figure 8. This photo represented economy for one student who works at this site. It also prompted discussions to think about sustainability and inter-generational equity for future generations and how to integrate more sustainable practices into schools. Two students saw this picture as a "call to action," finding it motivating and stimulating thought about sustainability in practice.

As part of the initial photo-elicitation assignment, students were asked to select a single photo that represented sustainability as a whole (Figures 9-11). One student represented solar paneals saying that "solar energy is the best option for power. This means that people's well-being is best served by using it. It creates jobs, eases pollution, and improves the health of people." Another took a photograph from the Monterey Bay Aquarium which re-enacts the natural history of peoples – from the Ohlone to early fishing villages – who have made their living from the Bay. The third photograph reflects people interacting with nature as a view of sustainability.



Figures 9-11. Photographs that represent "sustainability."

During the focus group, students were also asked to select one image from the gallery that reflected sustainability. Students selected photographs that reflected infrastructure and investments (Figures 12-14) as well as people promoting sustainability (Figure 15). In general, students discussion reflected a sophisticated understanding of the complexity of sustainability and its inclusion of social equity, economy, and environmental protection, care, access, and education.

Figures 12-14. Photographs that reflected infrastructure and investment in sustainability.

Figure 15. People promoting sustainability.

Focus Group Discussion of Sulite Test

Students found that the test mirrored or expanded their current thinking about sustainability. The test "gave a perspective we don't really get, putting it in a real world context, getting us to think critically, put beyond our comfort zone, makes us think about how we could get there." Some of the global policy students had not learned previously, including some of the actions the United Nations takes on the environment and global policy and action.

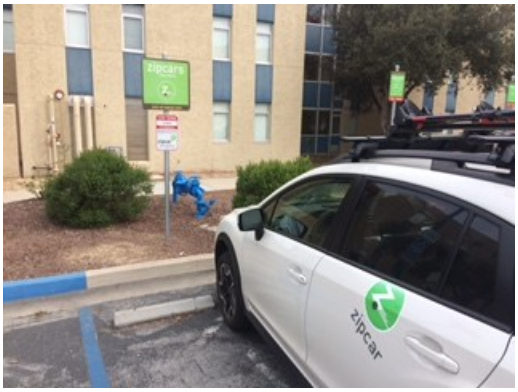
Focus Group Discussion of CSUMB Curriculum and Campus

While all participants expressed interest in sustainability and had knowledge of it, only 2 of the 4 said that they had sustainability integrated into their courses in any way. One student was from Environmental Studies, so sustainability was infused in many classes.

All students questioned why and how sustainability could be better integrated across majors and curricula. One student reflected, "we talk about social equity a lot," but why not sustainability? Another commented, "my major isn't about environmental science, we learn a lot about people, it would be cool if my courses incorporated random bombs of sustainability, we talk about the economy, why not talk about people?" A CHHS major suggested that adding sustainable housing placement options for internships required within the major "would be an awesome thing" and reflected that in general, the "environment is absent, links between equity and environment are missing." Students also suggested that maybe the First Year Experience courses would be a place to integrate sustainability across the campus. "If you make it about sustainability, especially what is happening on campus. If you don't know about it, how do you know you have an interest in it?" Students also thought about sustainability being integrated through the Common Read.

Students had a number of observations and suggestions for programming outside the classroom and infrastructure as well. Students had noticed many infrastructure improvements, including solar light poles. Infrastructure suggestions were for transportation, better energy usage and production, food, water, and waste. One student observed that the CSUMB police had new cars in their fleet that did not seem environmentally "friendly; there were "brand new huge trucks and vans. Our campus isn't so big to need that many police cars and they are driving around all day long."

In terms of programming, students said that they liked the earth day festival and environmental affairs committee. Students commented both that they wanted more information, such as a green guide for campus that located all sustainability in one place. One student responded to learning about the sustainability newsletter by saying, "that's cool. We get so many emails from the school, you just start ignoring them."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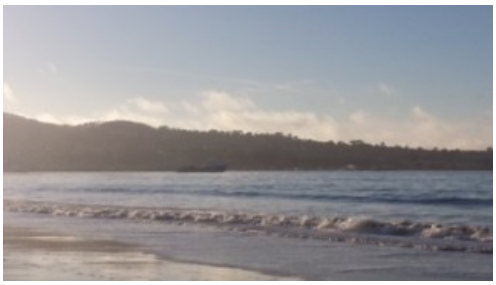
NO CHANGE GIVEN
VISA
STEP 1
PUSH BUTTON TO SELECT PURCHASE TIME
STEP 2
INSERT PAYMENT
STEP 3
TAKE RECEIPT PLACE ON DASH
PERMITS ARE REQUIRED AT ALL TIMES AND VALID IN ALL PARKING LOTS


OTTER

Economy



Environment

Social Equity

Sustainability