CALIFORNIA STATE UNIVERSITY, SACRAMENTO

DEPARTMENT OF ENVIRONMENTAL STUDIES

Assessing Sustainability Knowledge Report Fall, 2019

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Introduction

The purpose of the survey was to assess the student body's sustainability knowledge and prior and future sustainability behaviors. We use questions developed by the Environmental and Social Sustainability Lab at The Ohio State University called, Assessing Sustainability Knowledge (ASK), in the 2017 Stinger Sustainability Survey. Sustainability survey was conducted in part with participation of the Office of Sustainability and the students in the Fall, 2017 Sustainability Science and Policy (ENVS 144) class.

Undergraduates students at CSU, Sacramento participated in this survey. The ASK question items use the three pillars approach to create domains that can be tested to produce accurate and valid measures of sustainability knowledge. The subject questions were environmental, social, economics, carbon and the inter-subject questions were economics/environmental, social/economic, and environmental/social. The ASK measures will provide a way of testing students' knowledge and their motivation to address environmental problems.

A secondary and tertiary purpose of this study and report is to provide CSUS faculty and administration with longitudinal data showing how curriculum and students sustainability knowledge changes over time. This report will also provide the Office of Sustainability information to help assess sustainability goals and ranking assessments.

Key findings:

- Students answered 50.2% questions correctly on average
- Students have low economic sustainability knowledge
- Students had higher levels of social sustainability knowledge relative to other domains

Recommendations:

- Informational campaigns to students and faculty relating economic sustainability to campus and community programs
- Discussions with faculty and staff to increase sustainability throughout the curriculum
- Need to longitudinal data to show change in sustainability knowledge over time

Methods and Materials

The 2017 Stinger Sustainability Survey was developed at California State University, Sacramento (CSUS) with the help of the Office of Sustainability and the students in the Fall, 2017 Sustainability Science and Policy (ENVS 144) class. The Office of Sustainability at CSU, Sacramento partnered with the ENVS 144 Sustainability Science and Policy class, to develop a set of questions to address the sustainability knowledge of Sacramento State undergraduate students.

 The survey was administered to a random sample of undergraduate students using Qualtrics and through email. Upon the completion of this survey, students were entered into a raffle to receive either a bike lock or a coffee voucher.

Between October 1st, 2017 and November 22, 2017-- 8,480 undergraduate students were randomly selected to answer this survey out of the approximate 31,000 undergraduate population (N = 31,000; n = 8,480). The sample was created by the Office of Institutional Research. The survey was distributed via email with a link to the online survey. The first email was sent by the Office of the President while two subsequent emails were sent by Dr. Singh. Of those who were asked to participate, 1,011 started the survey for a response rate of 12%. Out of the 1,011 students who responded to the survey, 913 completed at least 25% of the survey and 707 completed the entire survey. These results can be generalized to the student body with a confidence level of 99% with a margin of error +/- 5%.

Sustainability knowledge questions were given as a "quiz" format therefore each question had a distinct right or wrong answer. See Appendix (Prasad & Singh, 2019) for exact questions and answers.

Four of which were environmental questions that addressed both technical aspects of the environment, such as the ozone layer and cause of pollution of streams and rivers. There were two questions each for the social and economic subjects. The social questions asked students to define sustainable development and wealth distribution of Americans. The economic questions asked students what the definition of economic sustainability was as well as the economics of electricity prices.

Ordering questions required each student to answer all parts of the question correctly in order to be awarded one point.

Survey data was downloaded from Qualtrics in a comma delimited file (.csv) and stored on Sacramento State computers. The data file was cleaned to check for systematic errors. See Prasad and Singh (2019) for the published codebook and dataset.

Results

The following information regarding demographics and sustainability literacy questions were derived from the Stinger Sustainability Survey Codebook.

Demographics

California State University, Sacramento prides itself on the immense diversity of the students attending the University. Fortunately, the students who participated in this survey were also from diverse backgrounds. The various ethnic backgrounds of students who participated in this survey displays a large White/Caucasian population, Hispanic/ Latinos, as well as Asian/ Pacific Islanders (See Figure 1). A slight manipulation of this data must be noted in terms of students who described themselves as mixed racial/ethnic background as this includes both students who chose mixed racial *and* more than one ethnicity groups. A disproportionate number of females, 590, answered this survey compared to the 296 males (Figure 2).
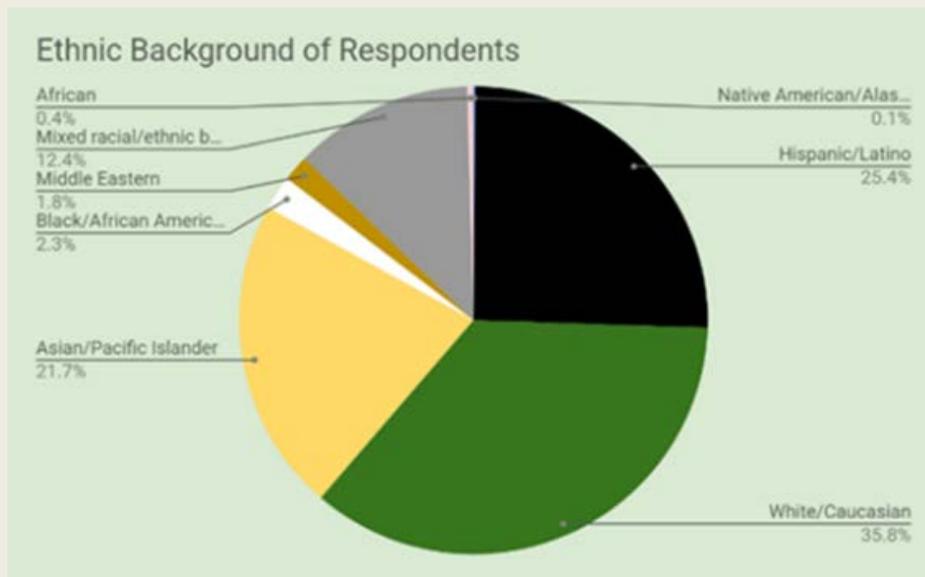

Figure 1. Ethnicity of respondents illustrates student diversity. Mixed racial/ethnic backgrounds includes individuals that chose mixed race and more than one ethnicity.
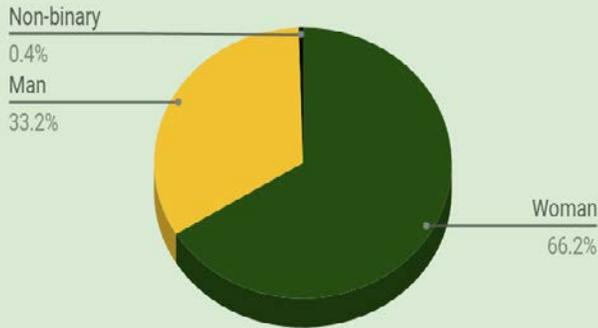
Figure 2. The gender demographics of undergraduate students surveyed. Non-binary individuals include respondents chose neither "man" or women" and then later clarified there gender identity (i.e genderqueer transman, agender-transmasculine, and nonconforming female)

However, it is less surprising to find that almost all the students surveyed live off- campus (93.2%) due to CSUS being known as a commuter campus. This means that students are more likely to live off campus instead of on campus.
The number of students who transferred from

Figure 2. The gender percentage of students who participated in this survey.

another campus was split as 52.1% of students transferred from another university while 49.2% of students did not. See Figure 3. The GPA range of most students who participated in this survey was fairly evenly distributed with the exception of students who received a GPA between 2.01 – 2.24 and 2.0 or less, See Figure 4. A variety of different colleges within CSUS were represented by the respondents as well (Figure 5).
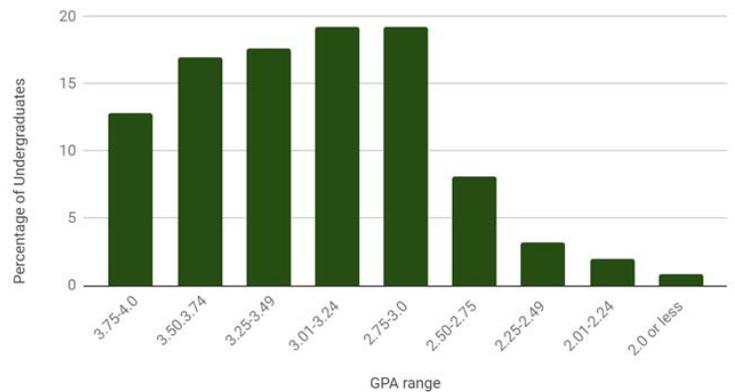

Figure 3. Percentage of undergraduates who participated in the Stinger Sustainability Survey and their GPA..

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Sustainability Literacy Per Subject

Students scored an average of 52.9% for the three subjects that they were tested in, Environmental, Social, and Economics, Figure 6. However, they scored about 10% lower in inter-subject questions with an average of 42.3% Figure 6. Table 2 illustrates the average percent correct for each question that the students were tested on.
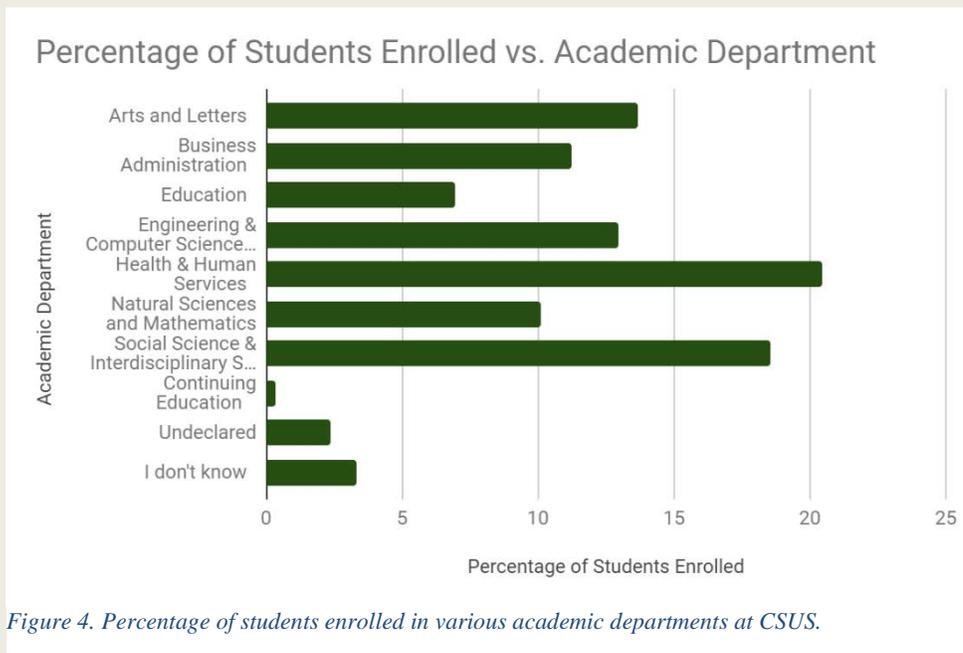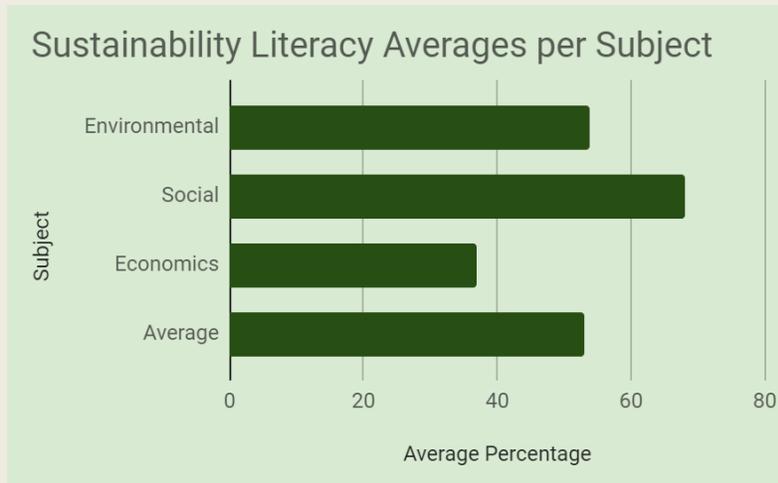

Figure 4. Percentage of students enrolled in various academic departments at CSUS.
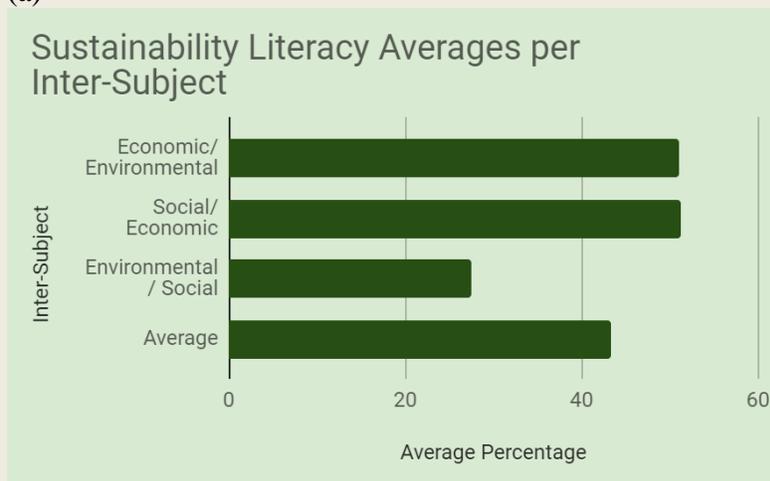
Table 2. Sustainability Literacy Questions and Average Percent Correct

Subject	Question	Percentage (%)
ENV1	What is the most common cause of pollution of streams and rivers?	32.1
ENV2	**Ozone forms a protective layer in the earth's upper atmosphere. What does ozone protect us from?**	**85.2**
ENV3	Which of the following is an example of sustainable forest management?	53.9
ENV4	**Of the following, which would be considered living in the most environmentally sustainable way?**	**44.3**
Carbon1	Which of the following is a major factor in the rise in global mean temperatures?	69.5
Carbon2	**Carbon neutrality is best described as:**	**63.2**
SOC1	Which of the following is the most commonly used definition of sustainable development?	59.8
SOC2	**Over the past 3 decades, what has happened to the difference between the wealth of the richest and poorest Americans?**	**76.4**
ECON1	Many economists argue that electricity prices in the U.S. are too low because...	38.6
ECON2	**Which of the following is the most commonly used definition of economic sustainability?**	**35.1**
EC/ENV1	Which of the following countries has now passed the U.S. as the biggest emitter of the greenhouse gas carbon dioxide?	81.4
EC/ENV2	**Which of the following is a leading cause of the depletion of fish stocks in the Atlantic Ocean?**	**20.6**
SOC/ECON	Which of the following is the best example of environmental justice?	51.3
ENV/SOC	**Put the following list in order of the**	**27.5**

Note: Average percentage was 50.2%.

Sustainability Literacy Averages per Subject

(a)

Sustainability Literacy Averages per Inter-Subject

(b)

Figure 6a. Average percent correct in the following categories: environmental, carbon, social, economics.

Figure 6b. Average percent correct in the following inter-subject categories for economic/environmental, social/economic, and environmental/social.

Figure 6 displays the averages for each subject and inter-subject. The average percent correct was 50%. It is however, important to note that there were a different number of questions per subject. For instance, there were 4 questions for Environment, and 2 for subject and inter-subjects Carbon, Social, and Econ, Econ/Env. There was only 1 question for the inter-subject Soc/Econ and Env/Soc.

Discussion and Conclusion

Overall students did not do well when it came to the literacy questions, with most students only getting half of the questions correct. Overall the most "successful" categories were the ones where the question only asked for one subject while inter-subject questions scored lower. The difference between the averages of subject questions and inter-subject questions was slightly higher than 10%.

The most successful single subject was social and the most "successful" inter-subjects were social/ economic followed by economic/environmental. However, one of the interesting things about the inter-subjects, was that the two most successful categories were economic/environmental and social/economic while the single subject questions that students scored the lowest in were in economics. This might convey that while students are not familiar with the economic aspect of sustainability, they are however more knowledgeable in other areas such as environmental and social subjects which is enough to offset their lack of knowledge in economics. Overall students did poorly in economics as well as inter-subject questions.

In the last 10 years CSUS has made immense strives in becoming a highly sustainable campus. However, this journey is far from over. Keeping in mind the University goal of being carbon neutral by 2045, the campus still has a lot of work to do in terms of making sure that students are sustainability literate.

Such awareness only comes from being conscious of problems in the first place. Therefore, requiring students to take one general education course that emphasize environmental sustainability will be the first step in having a more sustainability literate campus. However, this can be incredibly expensive and taxing on already strained University resources. Therefore, encouraging professors to incorporate environmental sustainability subject matter within their curriculum can be another option. Emphasizing social, economic, and environmental needs when possible in their original curriculum can allow students to become more mindful and literate about sustainability in their daily lives.