**Sustainable Housekeeping Final Report**  
Eco Reps 2020-2021  
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In Partnership with Penn Housekeeping Staff Joe Gaither, James Allen, and Wendy Sparks with Mentorship from Natalie Walker (Sustainability Manager)

**Abstract**

This is the third year of the Penn Housekeeping project in conjunction with Penn Sustainability Eco-Reps and the Penn Housekeeping division, aiming to enhance housekeepers' sustainability knowledge.

Initial steps were taken to create a pre-survey with basic climate questions to assess how much housekeepers knew about general sustainability, Penn sustainability initiatives, housekeeping sustainability practices, and overall care for sustainability. The content of the training slides fell under those four categories. The presentation was recorded on Zoom and uploaded on Youtube because of the limitations related to COVID-19. This was seen as the most efficient and effective way to reach out to the 400 plus housekeepers. A post survey was included to determine the effectiveness of the training.

Although the training slide has not reached the whole housekeeping team, it has shown a positive increase in sustainability knowledge through the sample data from those that have finished the training and filled out both post and pre survey. Results indicate that it would be beneficial to send the training presentation to new onboarding housekeepers and continue to cover the remaining housekeepers that have not taken the training.

**Introduction**

Penn Sustainability Eco-Reps are working with the Sustainability Office and Penn Housekeeping, a division of the Facilities and Real Estate (FRES) department, to improve the housekeepers sustainability knowledge. This aligns with the *Climate and Sustainability Action Plan 3.0 (CSAP 3.0)* goals of enhancing general sustainability education among Penn's staff.

**Project Overview**

The goal of this project is for Eco-Reps to enhance sustainability knowledge among all 436 housekeeping staff and encourage them to apply more sustainable practices to their housekeeping work and personal lives.

Due to the limitations of COVID-19, in-person training was not possible as it has been in past years. The first step was to modify the training program from last year’s Eco-Rep project to be virtual and safe for all participants. After discussions with James Allen and Joe Gaither, it was decided that a recorded video would be the most feasible option. A sustainability training presentation for the housekeepers containing general information on sustainability and climate change, Penn sustainability initiatives, sustainable housekeeping practices, and every day sustainable practices was developed and recorded. The training was made relevant to the housekeepers by highlighting the personal impact sustainability has on them and Philadelphia and was kept brief to maintain interest.
A survey was conducted before the video to determine the housekeeper’s prior familiarity with sustainability, and the same survey was conducted again after to determine the effectiveness of the training. The surveys asked housekeepers to express their level of familiarity with sustainability overall, their familiarity with penn specific initiatives, and their level of environmental passion.

**Research Findings**

Suggestions from previous years were implemented to this year’s presentation to keep the presentation interesting and personal. An emphasis was put on health risks, economic benefits, extreme weather conditions, Philadelphia climate, and visuals. The recorded video format also allowed the presentation to reach more housekeepers than in past years, especially since the 2020 training was cut short due to COVID-19.

The presentation began with an overview of sustainability and a definition of sustainability and environmental justice, followed by a clip of Leonardo DiCaprio speaking on climate change at the United Nation’s Climate Summit as he is a very well-known and respected public figure. The video was followed by a series of slides including pictures and shocking statistics on some of the most pressing climate issues today: global warming, natural disasters, air pollution, water pollution, deforestation, species extinction, and waste. These pictures and statistics effectively demonstrated the urgency at which we must act in order to save the planet with a large emotional appeal. The presentation then transitioned to Penn initiatives including the CSAP 3.0, dining initiatives, transportation initiatives, and LEED buildings around campus to give context on Penn’s sustainability commitments.

This was followed by the main part of the presentation - housekeeping sustainability efforts. The first practice highlighted was the recycling program. A reminder was given on what goes in compost, recycling, and trash bins as shown below. This was to ensure housekeeping staff are putting materials in the correct bins to minimize landfill waste.

![Figure 1. Proper waste disposal guidelines](image)

The next practice presented was Housekeeping’s transition from ready to use (RTU) to ready to dispense (RTD) bottles filled with super concentrate. One RTD bottle is the equivalent of 16 RTU
bottles. Reusable bottles can be filled with the super concentrate and water. This saves many plastic bottles, packaging waste, and emissions due to delivery transportation.

Housekeeping also transitioned from traditional trash bags to revolution bags, which are made of 100% recycled content materials. They are made in a closed loop recycling process where farmers use an agricultural film to grow their crops. Rather than the waste going to a landfill, Revolution Bag uses the agricultural film to make the trash bags.

The next focus was a new floor cleaning practice that uses water, rather than corrosive chemicals, and requires fewer applications. Not only is this better for the floors, but also for the health of housekeeping staff.

Next, a new waste management program was highlighted. Compactors are only emptied when the gauge reaches 80% full, which allows it to be emptied once a month rather than once a week. This saves emissions from waste transportation.

A new addition to the training was a lights out check, which reminded housekeepers to turn the lights off in any empty room when they are leaving in order to save energy, reduce emissions, and save money.

To close the housekeeping section, instructions were given for bird strike scenes. The purpose is to alert the sustainability office where bird strikes occur so they can work to reduce the number of bird deaths.

The presentation wrapped up with a reminder on how sustainability affects the daily life of housekeepers. This was followed by tips they can implement in their everyday life such as carpooling, composting, switching to renewable energy, following a cleaner diet, purchasing sustainable home cleaners, turning lights off, unplugging where possible, using reusable products, and of course, reducing, resuing, and recycling.

Lastly, housekeepers were asked to take part in a sustainability pledge to use this information to make a real change in their life.

**Results and Evaluation**
The pre- and post-presentation surveys had essentially the same questions to measure the amount learned from the presentation. There were 178 responses for the pre-presentation survey and 125 responses for the post-presentation survey. Ideally, all housekeepers would’ve completed both
surveys, but the results were successful considering the difficult nature of virtual programming. Both surveys had 8 questions. Questions 1, 3, and 5 asked housekeepers to rate their knowledge on a scale of 1-5 on environmental sustainability, Penn sustainability initiatives, and housekeeping sustainability initiatives respectively. Questions 2, 4, and 6 had housekeepers check off topics they were familiar with regarding environmental sustainability, Penn sustainability initiatives, and Housekeeping sustainability initiatives respectively. All topics listed were mentioned in the presentation to measure knowledge gained. Question 7 asked how much housekeepers cared about sustainability on a scale from 1-5 to determine how impactful the presentation was to viewers. The last question asked what sustainability topics housekeepers would like to learn about. The intent for this question in the pre-presentation survey was to gauge interest in certain topics to include them in the presentation. After discussion with partners James Allen and Joe Gaither, it was decided that the pre-presentation survey would be sent out at the same time as the presentation to avoid overwhelming housekeepers. This prevented us from being able to adjust the presentation accordingly. The answers for this question in both surveys can be used next year to discuss topics of interest.

**Question 1: How much do you know about environmental sustainability?**
Pre-presentation, 33.54% voted 4, and 19.25% voted 5. After the presentation, 47.54% voted 4 and 34.43% voted 5. There was a significant increase in the number of high responses, demonstrating an overall increase in sustainability knowledge.

![Figure 3. Form responses to question 1 before and after the presentation.](image)

**Question 2: What general sustainability topics are you familiar with?**
There was an increase in familiarity of all topics, especially climate change, deforestation, renewable energy, species extinction, resource depletion, and natural disasters. After the presentation, at least 60% of all participants were familiar with each topic.
Figure 4. Form responses to question 2 before and after the presentation.

**Question 3: How much do you know about Penn sustainability initiatives?**
Before the presentation, 9.82% answered 1 and 18.4% answered 5. After the presentation, the percentage of 1’s went down to 3.33% and the 5’s increased to 33.33%, also showing an increase in knowledge.

Figure 5. Form responses to question 3 before and after the presentation.

**Question 4: What Penn initiatives are you familiar with?**
There was an overall increase in familiarity, particularly in CSAP 3.0 and LEED buildings with a 29.3% and 19.6% increase respectively. After the presentation, at least 50% of all participants were familiar with each topic.
Question 5: How much do you know about Penn Housekeeping sustainability practices?
Pre-presentation, about 10% responded 1 or 2, but after the presentation there were 0 responses for 1 and only 1.65% for 2. This section was very successful because the results show that almost all housekeepers who participated have at least a mild understanding of housekeeping sustainability practices.

Question 6: What housekeeping sustainability practices are you familiar with?
There was an increase in familiarity in every category. There was less of an increase than in previous questions because participants already were quite familiar with each practice. Our goal was to expand their knowledge. Familiarity was above 75% for each topic, which is very successful.
Question 7: How much do you care about sustainability?
There was an overall increase in higher responses, but the data did not differ very significantly because the housekeepers demonstrated high passion for sustainability before the presentation. Most notably, 0% responded 1 after the presentation. The goal was to ensure housekeepers care about the environment, and the post-presentation data shows this goal was met.
Question 8: What is something you would like to learn about sustainability?

According to this word map of Housekeeper responses, there was a general interest in learning about recycling, energy, air quality, bird strikes, and Penn efforts in sustainability.
What is something you would like to learn about sustainability next year?

Figure 11. Form responses to question 8 after the presentation.

Once again, according to this word map of Housekeeper responses after the presentation, there was a general interest in learning “more”, “new” things, and specific Penn’s initiatives such as waste management, floor cleaning, and energy usage.

Conclusion
From the findings of the pre and post survey, it can be concluded that the housekeepers sustainability knowledge has increased. The findings show that there have been a significant increase in general environmental sustainability knowledge and Penn sustainability knowledge. As well as a minor increase in Penn housekeeping sustainability practices and overall interests in sustainability. This may be in part due to most housekeepers already being aware of housekeeping sustainability practices and interested in sustainability.

A benefit of the recorded video format was that it cut down the time housekeepers spent on the training, which helps maintain interest and works better with their busy work schedule. Housekeepers were also able to complete the training on their own time, which gives more flexibility but less accountability. An application of this project would be using the training video for future housekeepers. Having this video on hand would allow for quicker and more efficient training of housekeeping staff. This would let future Eco-Reps disregard creating a similar training program which relies on the basis of sustainability and instead another training program which goes deeper in sustainability topics.

Since in person training was not possible, it is difficult to judge how the housekeepers felt about the training overall. Next year, it is suggested that a question should be added to the final survey
including recommendations for change and if participants enjoyed the presentation. It was also
difficult to ensure participants were engaged the whole video. In past years, games were added in
the middle of the training to keep housekeepers engaged, which proved very successful.
Unfortunately this was not possible this year, but it should be added back once in person training is
possible again.

The Eco-Reps of 2020 also suggested switching from RTD bottles to tablets, which are even more
environmentally friendly. After discussion with James Allen and Joe Gaither, it was determined that
this is not feasible until a cheaper tablet company can partner with Penn housekeeping. This could
be an area of future research.

Another suggestion from 2020 Eco-Reps was to implement a sustainability rewards program. James
Allen and Joe Gaither were unsure how to implement this this year, so it was decided that all
participants would be entered into a raffle to win a sustainability prize pack including items such as
reusable bottles, bags, metal straws, and lunch boxes. A more widespread incentive could be looked
into next year.

It is also important to note that there is a difference in quantity of pre and post survey responses.
The pre survey had approximately 178 survey responses and the post survey had 125 responses.
This difference may influence a higher increase rate in sustainability knowledge as more engaged
participants would likely fill out the post survey compared to less engaged participants. Although this
is a good sample, the goal for the future is to train all housekeepers. The partners were not able to
make the training mandatory this year, but in the future this could greatly increase participation. An
additional followup would be having housekeeping managers among the housekeepers to watch the
training video together to make sure the video has been watched in full and both the pre and post
presentation survey have been completed. In person, this can be prevented in the future by ensuring
housekeepers finish the post survey before leaving. Another suggestion from previous years was to
include another survey weeks later to measure retention. Housekeepers were overwhelmed with
training and surveys this year, but this should also be implemented in the future.

Appendices
Key Stakeholders
1. Joseph Gaither, gaither@upenn.edu
2. James Allen, jgallen@upenn.edu

Pre-Presentation Survey: https://forms.gle/LpJNC9my2dVR2hb58
Post-Presentation Survey: https://forms.gle/8eRU4yV3RFQMfe8v8
Presentation Slides: https://docs.google.com/presentation/d/1WwaXXljYc6Bvn3QqZkgwEvTvJjcflhlqVpU7mIYWA/edit?usp=sharing

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Pre-presentation survey

Housekeeping Sustainability Survey - Pre Presentation

Name
Your answer

Email
Your answer

How much do you know about environmental sustainability?

1  2  3  4  5
Nothing at all (what is climate change?)  ○  ○  ○  ○  ○
A lot (I know most climate related issues)

Are you familiar with:

- ☐ Climate Change (e.g. rising CO2 levels)
- ☐ Deforestation
- ☐ Food Waste Management
- ☐ Composting/Recycling Waste
- ☐ Renewable energy (e.g. solar, wind, geothermal)
- ☐ Species Extinction (habitat lost, wildlife)
- ☐ Water pollution (e.g. ocean life destruction)
- ☐ Ozone/air pollution (e.g. carbon monoxide, nitrogen oxide)
- ☐ Natural Resource Depletion (e.g. fossil fuels)
- ☐ Climate-related Natural Disasters
- ☐ Climate related diseases
- ☐ Other:

How much do you know about Penn sustainability initiatives?

1  2  3  4  5
Nothing at all (What are Penn Climate Initiative?)  ○  ○  ○  ○  ○
A lot (I know all of these initiatives)
Post-presentation survey

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<th>Question</th>
<th>Options</th>
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<td>CSAP 3.0 Plan, LEED buildings, Carbon Neutrality, Fossil Free Penn, Other:</td>
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<tr>
<td>How much do you know about Penn Housekeeping sustainability practices?</td>
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<tr>
<td>Are you familiar with:</td>
<td>Composting, Recycling, New Floor Cleaning Practices, Sustainable chemicals (e.g., ready to disperse bottles), Sustainable Products (e.g., reusable bags), Lights Out Checks, Bird Strikes, Waste Management</td>
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<tr>
<td>How much do you care about sustainability?</td>
<td>1, 2, 3, 4, 5, Not at all, A lot</td>
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<tr>
<td>What is something you would like to learn about sustainability?</td>
<td>Your answer</td>
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Housekeeping Sustainability Survey - Post Presentation

Name
Your answer:

Email
Your answer:

How much do you know about environmental sustainability?

1  2  3  4  5
Nothing at all (what is climate change?)
A list (I know most climate related issues)

Are you familiar with:

☐ Climate Change (e.g. rising CO2 levels)
☐ Deforestation
☐ Food Waste Management
☐ Composting/Recycling Waste
☐ Renewable energy (e.g. solar Power, geothermal)
☐ Species extinction (habitat lost, wildlife)
☐ Water pollution (e.g. oceans life destruction)
☐ Air pollution (e.g. carbon monoxide, nitrogen oxide)
☐ Natural Resource Depletion (e.g. fossil fuels)
☐ Climate-related Natural Disasters
☐ Climate related diseases
☐ Other:

How much do you know about Penn sustainability initiatives?

1  2  3  4  5
Nothing at all (What are Penn Climate initiatives?)
A list (I know all of these initiatives)
Are you familiar with:
- CSAP 3.0 Plan
- LEED buildings
- Carbon Neutrality
- Fossil Free Penn
- Other: __________

How much do you know about Penn Housekeeping sustainability practices?

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Are you familiar with:
- Composting
- Recycling
- New Floor Cleaning Practices
- Sustainable Chemicals (e.g., ready to dispense bottles)
- Sustainable Products (e.g., revolution bags)
- Lights Out Checks
- Bird Strikes
- Waste Management

How much do you care about sustainability?

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What is something you would like to learn about sustainability next year?

Your answer: __________
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