

Net Impact Davis

# **PROJECT EVALUATION**

Planet Heroes

Sustainability is Elementary: Easy as TK to 8

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## I. INTRODUCTION

### Background

Net Impact is an international, non-profit organization whose primary goal is to encourage the development of sustainable solutions by people who take the initiative to drive change. Net Impact Davis (NID) is among one of their global chapters, being founded in 2016 by Nivi Achanta. Alongside the Innovation Institute for Food and Health (IIFH), NID fosters an interdisciplinary, project-based approach to sustainability in the community. Over the course of the year, members of the chapter work together to propose a local issue, develop a potential solution, and implement it in a local setting, producing an analytical review of their work.

### Year 1: 2016-2017

During its first year, NID had three projects: Water Management, Waste Management, and Education. The Water Management team started an initiative to connect soil science students with the UC Davis Student Farm by implementing an internship program that would benefit both parties, which included monitoring soil moisture levels with soil sensors to optimize crop yield and minimize agricultural water usage. The Waste Management team focused on increasing awareness and signage of composting around the UC Davis campus, and it held a test trial in the Peter J. Shields Library for two weeks. The Education team, now known as Project Link, a cross-cultural communication platform that combines video-chats and social media to foster engagement between UC Davis students and students at partner universities abroad to discuss global issues. While all projects were funded, Project Link was implemented and continues to remain active.

### Year 2: 2017-2018

In its second year, NID showcased an additional three projects: Poverty, Food Waste, and Waste Management. The Poverty team was interested in the process of developing and implementing a mentorship program that helps students of Grant Union High School in Sacramento, CA explore occupational and educational opportunities that they may seek after high school and help them overcome obstacles they face in pursuing these opportunities. The Food Waste team aimed to create a centralized online resource that provides transparent, accurate, and useful information on food help resources, creating a food-centered community that brings together related food help topics and issues spanning from open pantry times to food recovery etiquette. It aimed to not only feed people but also reduce food waste throughout our community. The Waste Management team is addressing the issue of massively generated waste by creating a smart trash can that can capture images of waste, process them and then automatically separate the waste into compost, recyclable, or landfill waste bins. They plan to create a prototype that implements Conventional Neural Networks (CNNs) and Computer Vision algorithms on a Raspberry Pi 3 to correctly

identify and sort trash. As a result of the IIFH's support, the Food Waste team received funding for their project.

### **Year 3: 2018-2019**

In this past year, NID reformed its project structure. Rather than having individual teams working towards separate projects, NID created a larger, more involved team-based approach to encourage emerging leaders to showcase their skills and gain experience managing a team. Hence, the organization is working together towards a communal goal. In doing so, we participated in the national Up to Us competition to raise awareness of the national debt, collecting over 140 pledges to send to the state and county representatives. The pledges served to encourage representatives to be mindful of their budget decisions by proving to them that we, as a university, have a voice and that we care about the effect of the national debt on our lives.

During the end of the year, we designed a project with a specific focus on plastic waste. We collaborated with Dixon Montessori Charter School (DMCS) to implement a recycling workshop series as well as a recycling competition. In total, we created a 5-part workshop series with 7 videos, each having a different focus regarding recycling (i.e. how to properly recycle, problems encountered when recycling, other recycling alternatives, etc.). The videos were designed in a manner that would allow for future use. The competition was carried out for approximately one month, totalling 7985 recycled items brought in by the students at DMCS and yielding \$440.22 in profit as a result. Additionally, NID rewarded the two top classes with ice cream and popsicles, and the two second place classes with reusable stainless steel straws to encourage further sustainable behavior.

Special thanks to our Year 3 team members: Viktoria Haghani (President), Amanda Taylor (Director of Finances), Grecia Ortiz (Director of External Affairs), Stephanie Tsai (Director of Internal Affairs), Carolyn Chandler (Director of Marketing and Design), Sara Cisneros, Ivan Luna, and Rylie Siegfried

### **Next Steps**

We look forward to a very ambitious and project-oriented year for the 2019-2020 school Year. First, we plan to continue the recycling competition and workshop series by expanding to three schools instead of one, which is due to the success we observed working with DMCS. Second, we intend to create a workshop series that will aim to educate students on the steps to composting and building/expanding a community garden at DMCS. Finally, we are going to participate in the Up to Us competition. Although it will be a busy year, the hard work and passion from the members will ensure that we will succeed!

## II. OBJECTIVES

### Phase One - Educational Recycling Workshops

Our main goal during our project was to encourage long term sustainable behaviors by providing educational workshops to the students of Dixon Montessori Charter School (DMCS). These workshops encompassed different types of sustainable behaviors that over a long period of time can make a drastic impact in our environment. We based our workshops on the importance of recycling and provided a simple concept that allowed students to associate new sustainability information to a topic that will be a constant symbol in life. We encouraged and maintained sustainable behaviors by providing students in the top class of each tier (TK-3rd grade and 4th-8th grade) with an ice cream party and the second place class of each tier with reusable stainless steel straws. Additionally, we created a publicly available [video series](#). By creating a self-sustainable recycling program for DMCS we accomplished two things. First, the recycling program made a positive environmental impact post-project. Second, the funds raised from recycling were returned to the school by working with the PTO Chair of Recycling of DMCS.

### Phase Two - Recycling Competition

As we developed our workshop series, we concurrently implemented a recycling competition on-campus to encourage students to bring in recyclables from home or from school. DMCS previously conducted a recycling competition, which brought in \$440.22. Through NID's intervention, we implemented a recycling program in the form of a competition. This acted both as a short-term project and a segway into a more permanent solution. This is significant because it allowed students to have experience with sustainable solutions and habits, which also brought in funds to the school. The goal was to educate students on how to recycle in their own homes by showing how to do it properly at school. In addition to the actual competition portion, the proceeds from the competition was given to the school and allocated towards supporting further sustainable behaviors (i.e. developing the community garden and composter). Additionally, through the use of a competition that provided rewards to students successful in recycling, it created a positive association with recycling and waste reduction.

### III. EVALUATION SCOPE & OBJECTIVES

#### **Promotion of Recycling**

Because the recycling program is based on our [video series](#), all the content we provided is available to watch anytime and anywhere. By making these videos public, students can watch the videos at home with their families, share it with friends, or other individuals can find them on our channel. Each video emphasized critical ideas around recycling and waste reduction, especially in regard to sea life conservation, a theme we used based off both the creativity of a student at DMCS as well as our goals in raising awareness of the problems we're facing.

#### **Entertainment Value of Videos**

According to the feedback we had received from school faculty, students have enjoyed the videos and some have watched them again on their own time. Direct student responses were never received, so we are unable to determine the accuracy of faculty comments. We were, however, told that the younger students preferred the videos to the older students on campus, indicating the need to make more age-appropriate videos for each grade tier. We aimed for students to enjoy the videos in order to help them retain the information presented.

#### **Success in Recycled Items and Funds Made**

Over the course of the month, 7,985 recyclable items were collected. Although the school has a recycling program that is currently being improved, the staff noticed a significant increase in the number of items being recycled. The 7,985 recycled items brought in by the students were taken to the local Recology recycling center, which raised \$440.22 that went to the school in its entirety.

#### **Continuation of Sustainable Habits and Behavior**

According to additional feedback we received from school, students have developed a growing interest in obtaining reusable material for various school activities, especially reusable utensils. One class sat down with the Chair of Recycling of the Parent Teacher Organization, Jenna Florent, and discussed a plan to implement reusable utensils and items in the cafeteria. Waste reduction and sustainable practices are continuous processes, which can only be successful if done over a long period of time. Fortunately, NID has helped get the ball rolling among the students at DMCS.

## **IV. METHODOLOGY**

### **Phase One - Educational Recycling Workshops**

Five workshops separated into seven different videos were made using Powtoons animation.

The workshops revolved around recycling: (1) what is recycling and what can be recycled, (2) the competition, (3) recycling problems, (4) your impact so far, and (5) why should we keep recycling. All workshops were produced in a video format, where NID members wrote the scripts, animated videos, and uploaded them to YouTube the week prior to each workshop presentation. From there, the link was given to faculty at DMCS for viewing in the classroom or auditorium. All language used in the workshop videos was simplified for a lay audience.

Workshop 1 addressed the premise of recycling and what it entails, such as breaking down terminology, addressing the different aspects of recycling, and showing examples of recyclable items. It also went into more specific examples of recyclable items and what students should be looking for in their homes, further specifying and solidifying the concept of recycling. Workshop 2 presented competition details (explained in Phase 2) to the students. Workshop 3 addressed issues we've seen with recycling (i.e. excess cans that are not clean; water bottles with water in them) or other problems people run into with recycling to further educate students. Workshop 4 included statistics about the amount of plastic students could have saved from going to the landfill and provided them with encouragement to ensure that they know the difference they are making. The final workshop concluded the competition and informed students how they can keep recycling in their lives, why it's important to do so, and introduced some alternative sustainable behaviors that can also be useful to the students.

Initially, we planned to assess the progress of students' education regarding recycling by conducting a simple survey before and after the workshop series for comparative analysis. The trial with DMCS demonstrated that schools tend to disfavor surveys, so we did not get much valuable information from the surveys and are unlikely to get significant feedback using this route in the future.

### **Phase Two - Recycling Competition**

#### **Competition Rules and Structure**

Because the primary goal of the project was to encourage and educate children on how to recycle, all students were responsible for recycling items whether that be bringing in items from home or only within the school. Students divided plastics (bottles) and metals (cans) in bags provided by the school. We initially planned that for every recyclable item brought in by the students, students and teachers would tally the number of recyclables. However, most students do not have adequate time to do this daily so the majority of the counting duty depended on any personnel who had time. Each class' goal was to reach 250 recyclable items. This was tracked in the teacher's preferred method; however, NID proposed the use of a thermometer-style progress poster in the shape of a soda can. Ultimately, the main rule was that the classes were responsible for keeping track of the recyclable items they bring in. However, the source of recyclable items

was left ambiguous to allow for students to bring in items from home. Although this may pose a conflict in some cases due to the availability of recyclables, the ultimate goal of the competition was to recycle and educate the students; thus, the source was left ambiguous.

### **Measuring Competition Progress**

NID was scheduled to pick up recyclable items twice in the span of four weeks. However, it was left open to the demand. For instance, if students bring in more items than expected, NID members may pick up the recyclables weekly instead of biweekly. NID planned to document the progress each class had made at each visit and gain feedback about progress in the workshop video series mentioned in Phase One, but our assistance appeared to be unneeded. Jenna Florent, the PTO Recycling Chair picked up the recyclables and recycled the items at Recology Dixon Recycling Center (located approximately 1 mile away from DMCS). All funds from the recycling project were obtained by the school through Jenna Florent, who will determine how the funds will be allocated/used within the recycling department.

### **Competition Results**

At the end of the competition, NID members were supposed to document progress made by each class, but this task was most easily collected by school staff due to the aforementioned reasons. The competition was split into two grade tiers: TK-3rd grade and 4th-8th grade. The first place for each tier was rewarded with an ice cream sundae party. The second place class from each tier received reusable stainless steel straws. Overall, Dixon Montessori Charter School students, 60 of which actively participated, recycled 7,985 items over the course of their 4 week recycling period.

### **Evaluation**

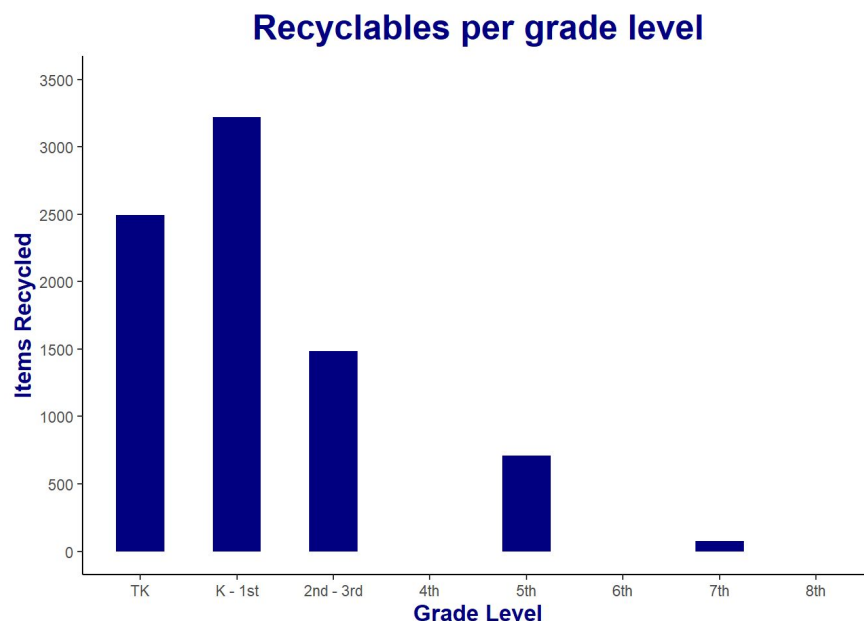
Competition success was expected to be conducted by (1) surveying school and teacher satisfaction with the results and provided material and (2) surveying student opinions using a “fun scale,” where students rank the portion of the program they thought was the most enjoyable and what they want to have improved next time. However, the surveys were not carried out as intended due to time and technology constraints. Students were only surveyed by informal hand raising to verbal questions which may not reflect the true state of knowledge of all students. There were further issues as a result of non-participation, non-aged adjusted questions, and qualitative rather than quantitative results.



## V. FINDINGS

### Findings for this Project

1. One of the recipients of the ice cream parties requested popsicles due to dairy and other food allergies and, instead, requested popsicles.
2. Powtoon is not a user friendly animation program; however, the resulting animations are of great quality.
3. Younger students (i.e. kindergarten, 1st grade) are the most active participants. This may not only be a result of parental involvement, but also of the greater interest taken by the young students because of the workshop series (see “Recyclables per grade level”).
4. Older students (3rd grade and above) were less likely to recycle as often as the younger students
5. Teacher involvement heavily influenced the likelihood of students to participate in the recycling competition



### Findings that Aid in Future Implementation

1. The use of surveys, unless administered by NID, is difficult to both implement and use as a means of assessment. Thus, a new method of assessing learning should replace the use of surveys.
2. Communication with school staff members takes time, so it is necessary to reach out and contact staff members in advance.
3. Due to the overall objective of decreasing plastic use, if funds allow for it, trash bags used for collection should be substituted with reusable collection bins.
4. Students did not count their own recyclables, so a more efficient method of counting recyclables is needed.
5. The workshop series was not as suitable for older students. Thus, a more age-appropriate workshop series can be created for older students.

## **VI. CONCLUSIONS AND NEXT STEPS**

Overall, we observed immense success in the implementation of both the recycling workshop series and the recycling competition. By encouraging students to bring in 7985 recyclables and raise \$440.22, we have helped introduce and encourage long-term sustainable behaviors.

Although we succeeded in achieving our objectives, there are a few things we plan on changing if we implement this competition again. First, we would contact personnel involved earlier and communicate the plan such that all parties know what to expect. Then, we would try to improve the speed at which recyclables were counted. For example, counting of recyclable items may be significantly faster if they are sorting by size and material then weighing out the collective amounts. For each category, the total weight can be divided by the weight of a single representative bottle to figure out the totals. Thus, counting individual items would no longer be necessary.

Ultimately, NID plans to re-implement the competition and expand to a wider audience (i.e. three schools instead of one) due to the success observed at DMCS.

## **VIII. REFERENCES**

1. [Net Impact Davis YouTube Channel](#)
2. Graph generated by RStudio (Created by Stephanie Tsai)