

Net Impact Davis
March 6, 2019

PROJECT PROPOSAL

Planet Heroes

Sustainability is Elementary: Easy as TK to 8

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1. Summary

Net Impact Davis (NID) will be working with Dixon Montessori Charter School (DMCS) to implement a project targeting plastic waste. The project consists of two phases: (1) presenting recycling workshop series to students to teach them how to properly recycle and (2) implementing a competition among the classes on-campus to encourage students to bring in recyclable items.

The purpose of this project is to teach both parents and students how to develop and maintain sustainable behaviors, resulting in a self-sustaining recyclable program at DMCS. By self-sustainable, we mean without NID intervention, in that once we step back from the project, DMCS is able to continue on with the implemented projects, particularly with involvement from the Parent-Teacher Organization (PTO).

We expect the total budget to be approximately \$150, including travel costs, rewards for students, and other items required for collaboration with DMCS. NID is requesting monetary support in order to fund the project and allow NID to work with DMCS.

2. Introduction

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. 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.

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.

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.

In its current year, NID has found itself reforming its project structure. Rather than having individual teams working towards separate projects, NID has 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 have 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. For the current quarter of the 2018-2019 school year, we are working on project design with a specific focus on plastic waste. Due to collaboration with Dixon Montessori Charter School (DMCS), we have narrowed our focus to recycling and plan to implement a workshop series and recycling competition at DMCS.

3. Needs/Problems

Phase One - Educational Recycling Workshops

Children are the future, and in a point of their life where they're the most influenceable, it is important to intervene and introduce positive sustainable behaviors. By teaching them different ways to properly recycle, we hope to engrain these habits as a normal part of daily life. We intend for their learned behaviors to carry on throughout their life and to be shared with their family. The workshops will focus on different ways of recycling, what is recyclable, how to properly recycle, and why we should recycle. In presenting these workshops, we are planning to integrate fun and interactive activities with an educational presentation to make it memorable and ensure that students gain an effective understanding of the importance of recycling.

Phase Two - Recycling Competition

DMCS has previously conducted a recycling competition, which brought in approximately \$400 of profit. They do not, however, have a maintained recycling program on-campus. Through NID's intervention, we are implementing a recycling program in the form of a competition. This will act both as a project short-term, and it will also segway into a more permanent solution. This is significant because it allows for students to have experience with sustainable solutions and develop them into habits as well as bringing in funds to the school. The goal is to educate students on how to recycle in their own homes by showing them how to do it properly at school. In addition to the actual competition portion, the proceeds from the competition will be 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 provides rewards to students successful in recycling, it will create a positive association with recycling, encouraging students to continue recycling.

4. Goals/Objectives

Phase One - Educational Recycling Workshops

- Encourage sustainable behaviors in the long run by providing educational workshops to students regarding different types of sustainable behaviors
- Teach students at Dixon Montessori Charter School to minimize their impact on the environment by teaching and encouraging them to recycle

- Encourage maintenance of sustainable behaviors by providing students in the top three winning classes with reusable stainless steel straws
- Create a self-sustainable recycling program that continues having a positive environmental impact and returns funds to the school by working with Jenna Florent (PTO Chair of Recycling)

Phase Two - Recycling Competition

- After a workshop series, implement a recycling competition on-campus to encourage students to bring in recyclables from home or from school
- Encourage maintenance of sustainable behaviors by providing students in the top three winning classes with sustainable goods (i.e. reusable straws)

5. Procedures/Scope of Work

Phase One - Educational Recycling Workshops

The workshops will consist of five separate workshops all revolving around recycling: (1) what is recycling and what can be recycled?, (2) the competition, (3) addressing recycling problems, (4) your impact so far, (5) why should we keep recycling? All workshops will be conducted in a video format, where NID members will write a script, record the video, and upload it to YouTube the week prior to each workshop. From there, the link will be spread to the faculty at DMCS for viewing in the classroom. All language used in the workshop videos will be simplified for a lay audience, particularly an audience of children, to understand.

Workshop 1 addresses the premise of recycling and what it entails, such as breaking down the meaning of the term, addressing the different aspects of recycling, and showing examples of recyclable items. It also goes into more specific examples of recyclable items and what students should be on the lookout for in their homes, further specifying and solidifying the concept of recycling. Workshop 2 presents competition details (explained in Phase 2) to the students. Workshop 3 addresses 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 is another update regarding students' progress. It will include statistics about the amount of plastic they have saved from going to the landfill, showing their growth and providing them with encouragement and ensuring that they know the difference they are making. The final workshop will conclude the competition and tell students how they can keep recycling in their lives and why it's important to do so, fulfilling NID's goal of effectively educating the students at DMCS.

In order to assess the progress of students' education regarding recycling, a simple survey will be given to students before and after the workshop series for comparative analysis. This method of evaluation is further elaborated on in Section 9 (Evaluation).

Phase Two - Recycling Competition

Competition Rules and Structure

Because the primary goal of the project is to encourage and educate children on how to recycle, all students will be responsible for recycling items whether that be bringing in items from home or only within the school. Students will divide plastics (bottles) and metals (cans) in bags provided by NID. For every recyclable item brought in by the students, students and teachers will tally the number of recyclables. Each class' goal is to reach 250 recyclable items. This will be kept track in the teacher's preferred method; however, NID will propose the use of a thermometer-style progress poster in the shape of a soda can. Ultimately, the main rule is that the classes are responsible for keeping track of the recyclable items they bring in. However, the source of the recyclable items is left ambiguous to allow for students to bring in items from home.

Measuring Competition Progress

NID is scheduled to pick up recyclable items twice in the span of four weeks. However, it is 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. All recyclables will be stored in classrooms inside bags given to DMCS by NID. NID will document the progress each class has made at each visit, providing feedback about progress in the workshop video series mentioned in Phase One. NID members will drive to DMCS, pick up the recyclables, and recycle the items at Recology Dixon Recycling Center, which is located approximately 1 mile away from DMCS. All funds will be returned to the school, particularly Jenna Florent, the PTO Chair of Recycling, who will determine how the funds will be allocated/used.

Competition Results

At the end of the competition, NID members will document progress made by each class. A total count will be determined as feedback for the school. The class with the highest number of recyclable items will receive an ice cream sundae party. The top three classes will receive reusable stainless steel straws. The timeline is broken down below for details regarding event timing.

Evaluation

Competition success will be evaluated 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.

6. Timetable

Phase	Description of Work	Start and End Dates
Phase One	Educational Recycling Workshops	April 6 - May 24
Phase Two	Recycling Competition	April 19 - May 31

Phase One - Educational Recycling Workshops

- Workshop 1 (April 12, 2019): What is Recycling and What Can be Recycled?
- Workshop 2 (April 19, 2019): The Competition
- Workshop 3 (May 10, 2019): Addressing Recycling Problems
- Workshop 4 (May 17, 2019): Your Impact So Far
- Workshop 5 (May 24, 2019): Why Should We Keep Recycling?

Phase Two - Recycling Competition

- April 19, 2019: Competition Announcement
- April 22, 2019: Competition Begins
- May 10, 2019: Competition Update #1
- May 17, 2019: Competition Update #2
- May 24, 2019: Competition Closes
- May 27, 2019: Competition Winners Announced
- May 31, 2019: Ice Cream Sundae Party!
- May 31, 2019: Pass out reusable straws to top three classes

ACTIVITY	DUE DATE	RESPONSIBILITY
1 Design and implement educational recycling workshops for students at DMCS	May 24, 2019	All members
1.1 Write the script for Workshop 1	April 6, 2019	Viki, Grecia, Carolyn, Stephanie, Zanny
1.2 Film Workshop 1	April 7, 2019	Viki, Grecia, Carolyn, Stephanie, Zanny
1.3 Edit and upload Workshop 1	April 10, 2019	Viki, Grecia, Carolyn, Stephanie, Zanny
1.4 Email Workshop 1 to DMCS	April 11, 2019	Viki, Grecia, Carolyn, Stephanie, Zanny
1.5 Write the script for Workshop 2	April 13, 2019	Rylie, Amanda, Ivan, Sara
1.6 Film Workshop 2	April 14, 2019	Rylie, Amanda, Ivan, Sara
1.7 Edit and upload Workshop 2	April 17, 2019	Rylie, Amanda, Ivan, Sara
1.8 Email Workshop 2 to DMCS	April 18, 2019	Rylie, Amanda, Ivan, Sara

1.9 Write the script for Workshop 3	May 4, 2019	Carolyn, Amanda, Stephanie, Rylie, Henry
1.10 Film Workshop 3	May 5, 2019	Carolyn, Amanda, Stephanie, Rylie, Henry
1.11 Edit and upload Workshop 3	May 8, 2019	Carolyn, Amanda, Stephanie, Rylie, Henry
1.12 Email Workshop 3 to DMCS	May 9, 2019	Carolyn, Amanda, Stephanie, Rylie, Henry
1.13 Write the script for Workshop 4	May 11, 2019	Grecia, Viki, Ivan, Rylie, Zanny
1.14 Film Workshop 4	May 12, 2019	Grecia, Viki, Ivan, Rylie, Zanny
1.15 Edit and upload Workshop 4	May 15, 2019	Grecia, Viki, Ivan, Rylie, Zanny
1.16 Email Workshop 4 to DMCS	May 16, 2019	Grecia, Viki, Ivan, Rylie, Zanny
1.17 Write the script for Workshop 5	May 18, 2019	Stephanie, Grecia, Amanda, Viki, Henry
1.18 Film Workshop 5	May 19, 2019	Stephanie, Grecia, Amanda, Viki, Henry
1.19 Edit and upload Workshop 5	May 22, 2019	Stephanie, Grecia, Amanda, Viki, Henry
1.20 Email Workshop 5 to DMCS	May 23, 2019	Stephanie, Grecia, Amanda, Viki, Henry
2 Design and implement a recycling competition for students at DMCS	May 31, 2019	All members
2.1 Announce competition	April 19, 2019	Rylie, Amanda, Ivan, Sara
2.2 Competition begins	April 22, 2019	N/A
2.3 Recycling Pick-Up #1	April 26, 2019	(TBD BY MEMBER AVAILABILITY)
2.4 Recycling Pick-Up #2	May 3, 2019	(TBD BY MEMBER AVAILABILITY)
2.5 Competition Update #1	May 10, 2019	Carolyn, Amanda, Stephanie, Rylie
2.6 Recycling Pick-Up #3	May 10, 2019	(TBD BY MEMBER AVAILABILITY)
2.7 Competition Update #2	May 17, 2019	Grecia, Viki, Ivan, Rylie
2.8 Recycling Pick-Up #4	May 17, 2019	(TBD BY MEMBER AVAILABILITY)
2.9 Recycling Pick-Up #5	May 24, 2019	(TBD BY MEMBER AVAILABILITY)

2.10 Competition closes	May 24, 2019	N/A
2.11 Competition winners announced	May 27, 2019	Stephanie, Grecia, Amanda, Viki
2.12 Ice Cream Sundae Party	May 31, 2019	All members
2.13 Pass out reusable straws to top three classes	May 31, 2019	All members

7. Budget

	Description	Start and End Dates	Estimated Cost
Phase One	Workshop Videos	April 6th-May 23rd	\$0
Phase Two	Recycling Competition	April 19th-May 31st	\$148.53
		Total	\$ 148.53

Phase 2 Projected Budget		
Description	Estimated Cost	Notes
Transportation to DMCS	\$6.01	per round trip
Transportation to Recology	\$0.52	per round trip
Reusable Straws	\$66	100 straws
Ice Cream for Party	\$14	2 flavors
Bowls/Spoons	\$30	
Toppings	\$12	Chocolate, Caramel, Sprinkles
Garbage Bags	\$20	
Total:	\$ 148.53	

In calculating the budget we assumed that Net Impact will be covering all costs related to running the competition. The recycling collected will be turned in for profit which will return to the school and the recycling program in efforts to make it self-sustainable without any additional money coming from the school.

8. Key Personnel

Client	Dixon Montessori Charter School (DMCS)
Key Clientele	Benjamin Ernest (Principal) Jenna Florent (PTO Chair of Recycling) Derek McGovern (6th Grade Teacher)
Sponsor	UC Davis Innovation Institute for Food and Health
Project Manager	Viktoria Haghani
Team	Carolyn Chandler, Sara Cisneros, Ivan Luna, Grecia Ortiz, Henr Reich, Rylie Siegfried, Amanda Taylor, Stephanie Tsai

9. Evaluation

The main goal of this project is to encourage children and their families to be more mindful and sustainable in their waste management. Because this is a multi-part project, we will be independently evaluating feedback at the conclusion of each topic, so we can gauge the effectiveness of program activities.

Phase 1 and 2 Assessment - Recycling:

An initial evaluation using Google Forms (for teachers) and Kahoot (for students) will be conducted at the beginning of the program to establish the student’s and teacher’s baseline knowledge regarding recycling and sustainability. Kahoot will be used with students because it is more interactive for them to use, while being fun and good for data collection. Results from the evaluation will be compared to a final knowledge and satisfaction survey at the end of the recycling program to analyze educational effectiveness of the program. A sample of questions asked are shown in table 1.

Additionally, we will collect verbal or written feedback from students, teachers, and parents at each workshop to tailor instruction styles for effective lessons.

Classroom recycling competition will be monitored by teachers and staff at DMCS. Teachers will be counting collected items to track the amount of recyclable waste throughout the program. The NID team will report and deliver recycling funds generated at a weekly or biweekly basis to monitor overall recycling success.

Table 1: Sample Questions

For Teachers

Question (1-5 scale)	What the results tell us
Was this recycling program easy for you to implement?	Gauges how much work teachers felt they needed to do.
Did you like the video format?	Tells us if teachers were satisfied with YouTube style instruction.
Did you think the content was adequate for your class level?	Gathers teacher’s opinion on if content is at the proper literacy and comprehension level.
Do you fill the collection bins were intrusive in the classroom?	Evaluates if we need a less intrusive collection bin.
Was the recycling picked up fast enough?	Evaluates if we needed to do more trips or find a more efficient way to pick up trash.
Did you need to re-sort the recycling at any	Evaluates if students are properly sorting and

point? (were any items misplaced in the wrong container)	cleaning their items.
Which of the following would you like to see added on? (handouts, interactive activities, other)	Determines if teacher's feel students need extra material.
Additional comments	Collection of any pressing thoughts teachers have about the recycling program.

For Students

Question	What the results tell us
Did you have fun with recycling?	Determines if students enjoyed the time they spent.
Name one thing you learned about recycling	Figure out what idea they remember most.
Did you tell your family about what they should be recycling?	Determines if they are actively recycling at the family level.
Did you like learning about recycling with videos?	Determines if students enjoyed the time they spent.
Did you like the videos, recycling competition, or both or none?	Determines what portion of the program was most engaging to students.
Is there anything you want to say to the people in the videos?	Anything is possible, so this can just be a space where students can say anything that stood out to them.

10. Endorsements

UC Davis Innovation Institute for Food and Health (IIFH)

Dixon Montessori Charter School

11. Acknowledgements

NID would like to acknowledge Jorge Lopez and Ivan Luna for proposing to work school children and implementing sustainable practices at the school, respectively. We would like to thank Grecia Ortiz for connecting us to Dixon Montessori Charter School. Additionally, we would like to thank the UC Davis IIFH for their continuous support and feedback on the project. Finally, we would like

to thank Benjamin Ernest, Derek McGovern, and Jenna Florent from DMCS for their enthusiasm towards the project and for allowing us to work with their school.

12. Next Steps

- Both the recycling project and garden project will need volunteers, such as parents, teachers, and/or school administrators to oversee the operation when NID takes a step back.
- To better ensure that the recycling system remains operational after NID steps away, a guide, such as a book of contacts, addresses/locations, and steps for individuals involved, should be passed off to those taking over the project/system at DMCS.