

Makerspace

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2. PROJECT DESCRIPTION

Manurewa High School (MHS) Makerspace is an incomplete project that began at the commencement of 2018. Manurewa High School's Makerspace is a place that is accessible to all students, teachers, and staff to investigate their ideas and projects utilizing technology.

2.1 Project Overview

We initially started Makerspace as an extra-curriculum project hence students could access Makerspace outside school time. MHS Makerspace has a weekly session, which is open for all students from 2:30 pm to 4:30 pm. Every Wednesday, we have a mentor that arrives at Makerspace that facilitates all learning. Due to our mentor and teacher's clear and humble speech, and the freedom they have provided, we have been able to create a warm, welcoming and safe environment. As a result, the students have been able to express their creativity with no restrictions. Makerspace has a variety of technology to cater to numerous students' interests. For example, GOGOBoard, Makey Makey, CNC Router, Laser Cutter, 3d Printer, Photo Booth, Adobe products, VR Headset, Sewing Machine, Vinyl Cutter.

2.2 Lessons Learned

Throughout the year, we have learned several valuable lessons and gained significant success. From our many prominent successes, one would be drawing and sustaining the students' interests. Makerspace started with 20 students who would attend regularly. Although most of us students were foreigners to each other, we were able to bond immediately over the love for technology. Eventually, we attracted numerous students to Makerspace by our video that highlights what Makerspace is and what it offers. Despite the increase in members, we maintained the family-like environment. As a result, we realized that the students love Makerspace because of the safe, welcoming and entertaining space we have created. We welcomed all students, staff and our community by disregarding their skill level with technology. I believe that the environment of a fabrication space is crucial. Despite a place possessing state of the art technology, if the nature of the area is unsettling, unwelcoming and negative, the consumers will not stay.

Through our journey, we realized that the learning that takes place in Makerspace is astoundingly different from learning in class. For example, Year 10 electricity standard, the teaching in class is theory based and involves a tremendous amount of comprehension when a teacher explains. Though in Makerspace, we receive the same knowledge but in an interactive way without a teacher's presence through technology. Makey Makey is a circuit board that teaches the laws of electricity. It allows the user to connect everyday objects that are conductive and convert it into a controller. If education becomes more interactive and entertaining, the student's passion and curiosity to explore increases.

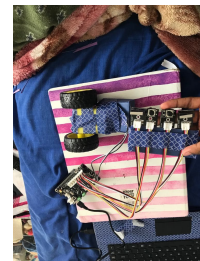
Another lesson Makerspace taught was using practical instead of theory-based learning worked better for students. The students were thrilled about making tangible products. They had to overcome a steep learning curve and problems to produce products. In Makerspace, there is freedom to explore technology at your own pace. Hence, they gained numerous and unexpected information. Additionally, they presented a tangible product that showcased their learning.

2.3 My Experience

I was attracted to Makerspace by the coding workshops and my interests in robots. I began to indulge in basic programming, learning how to utilize the GOGOBoard. Through this venture in technology, I learned how to create an alarm-controlled car using GOGOBoards.



This is the setup of the alarm



This is the setup of the wire controlled car/motor.

During my coding phase, I learned how to use the Makey Makey circuit board. From the Makey Makey, I transformed a fruit into a piano key and succeeded in making a Guitar Hero.



In this image, you can see that the grapes are used as controls using Makey Makey



In this image, we have the circuit of the guitar hero is complete.

A different type of technology caught my attention, which was the laser cutter. I was hesitant to use the laser cutter as I was a beginner in designing. However, I learned how to use Adobe Illustrator to design and RDWorks to manipulate the laser cutter for diverse designs. From this venture in Makerspace, I was able to combine my coding skills and the laser cutter to produce a 3d version of my Guitar Hero.



We cut out multiple guitar, each having different measurements



We stacked each cut-outs on to each other



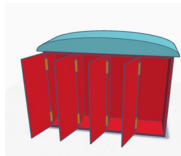
After stacking the 3d guitar was built and cables were fitted.

Through Makerspace's welcoming and open atmosphere, I was able to combine another extra-curriculum project into Makerspace. I am apart of All for One Locker Project, which has built lockers for homeless people. All for One has entered into Future Problem Solving. The group slowly became a conjoined project with Makerspace. AFO started in 2017 - if Makerspace had been available to us, our group would have been able to accomplish their goals quickly. For example, we had to approach an organization outside the school to help us in building the lockers.

Recently, the group has decided to make more lockers for other communities. Makerspace has provided us with connections to our school's trades academy, which has shown interest in manufacturing lockers.

Makerspace and All For One Locker project have produced a video together, to highlight AFO's journey. We entered the video into Outlook for Someday 2018 film challenge. We were selected as one of the 20 winning films and won the Karma Cola; Planet & People's Award. [Our video >>](#)

AFO will utilize Makerspace's 3d printer and laser cutter to make a miniature model of the lockers. AFO will be presenting the models at the International Future Problem Solving 2019 in Massachusetts, USA.



This is the design of the lockers on TinkerCad



This is the 3d model we have made

To raise funds for my trip to America and Makerspace, I have established a social enterprise. I have used the laser cutter to make custom goods.



This one of our products (Christmas ornaments) packaged.



Another product, Turtle Keychains that has been made from the laser cutter



This is the packaged product that we are selling

While establishing, I learned to write a business plan, manage cost, understand the ways to make profits, the importance of packaging and grasped the general methods of advertisement.

3. BIOS

I am Yashna Kumar. I am in Year 11 at Manurewa High. My interests are Making, Science, Problem Solving.