

7-17

PROJECT DIGITALIZE

Project Type: Single year

Group members:

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SECTION 1: PROJECT OVERVIEW

1.1 Area of Concern

As the world becomes increasingly digitalized, coding and computing skills hold an unprecedented amount of significance today. According to research, benefits of learning how to code not only hones our IT skills, it also develops problem-solving skills, divergent thinking, and computational thinking¹. Coding has been dubbed as one of the most important job skills of the future, hence learning the skill can open up many career opportunities². However, chances to learn this essential skill is not open to all, especially for those without sufficient resources.

1.2 Challenges identified

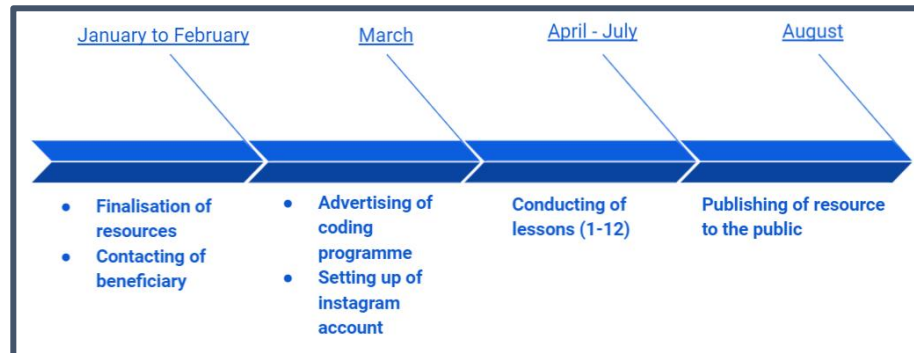
The main challenge is that existing coding classes available to the public are relatively costly. Weekly coding classes targeted at children can cost from \$300-\$500 per month, and coding workshops can range from \$280-\$1,400³. Thus, those from under-privileged families who are interested in coding, lack a learning platform for them to pursue their passion. Even though MOE implemented the Code for Fun programme for Upper Primary students, it only includes 10 hours of coding lessons a year, thus the content taught is severely limited⁴.

1.3 Underlying problem

Given that students from less-privileged families lack resources and opportunities to gain exposure on coding and pursue their passion in the area, how might we provide them with easily accessible resources and opportunities to learn essential coding and computing concepts and spark their interest in the field?

1.4 Plan of Action

1.4.1 Timeline:



1.4.2 Beneficiary

We decided to collaborate with the Chinese Development Assistance Council (CDAC), a non-profit self-help group which offers various schemes and services to help the underprivileged in the community.

1.4.3 Target Audience

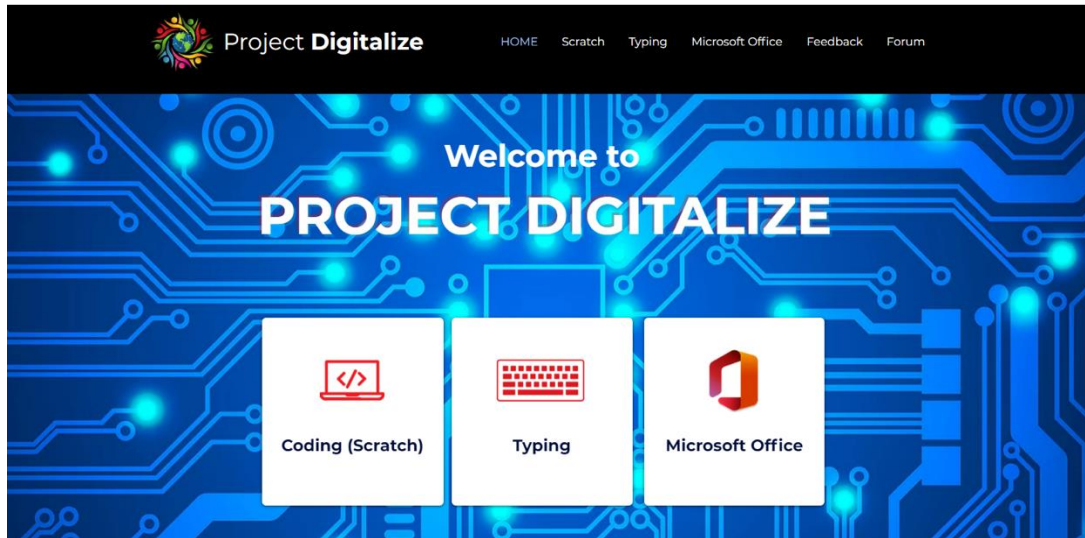
The main target audience of our project are Primary 3 and 4 students under CDAC's Programme Fee Subsidy Scheme. Resources will also be made available to the public via social media platforms such as Instagram.

1.4.4 Lesson Plan

The content of lessons for the target audience is split into 3 main parts: Scratch block-based programming, Microsoft (Word / Excel / PowerPoint) and Touch Typing. A total of 12 lessons, each lasting 1.5 hours, were carried out with the students.

1.4.5 Resources

All learning resources used during the lessons are compiled into a comprehensive website. Our website is designed to be a self-teaching resource and contains a total of 8 self-made video tutorials with voiceovers. It also contains interactive elements, tasks, step-by-step walkthroughs and tips for users to better grasp various skills.



SECTION 2: IMPLEMENTATION OF PLAN

2.1 Coding and computing lessons @CDAC

The first 4 lessons were carried out physically at CDAC@Jurong. We utilized drawing and brainstorming activities to get to know the students better. Aside from slideshow presentation, we also made use of interactive learning platforms such as Kahoot to further their understanding of coding concepts. However, due to Covid-19 restrictions, we had to shift lessons 5-12 online via Zoom. Thus, we had to explore new methods to keep students engaged during lessons, which include changing the presentation style and pace, using more learning games and utilizing more applications instead of pure theory.

2.2 Collaboration with Project Halcyon

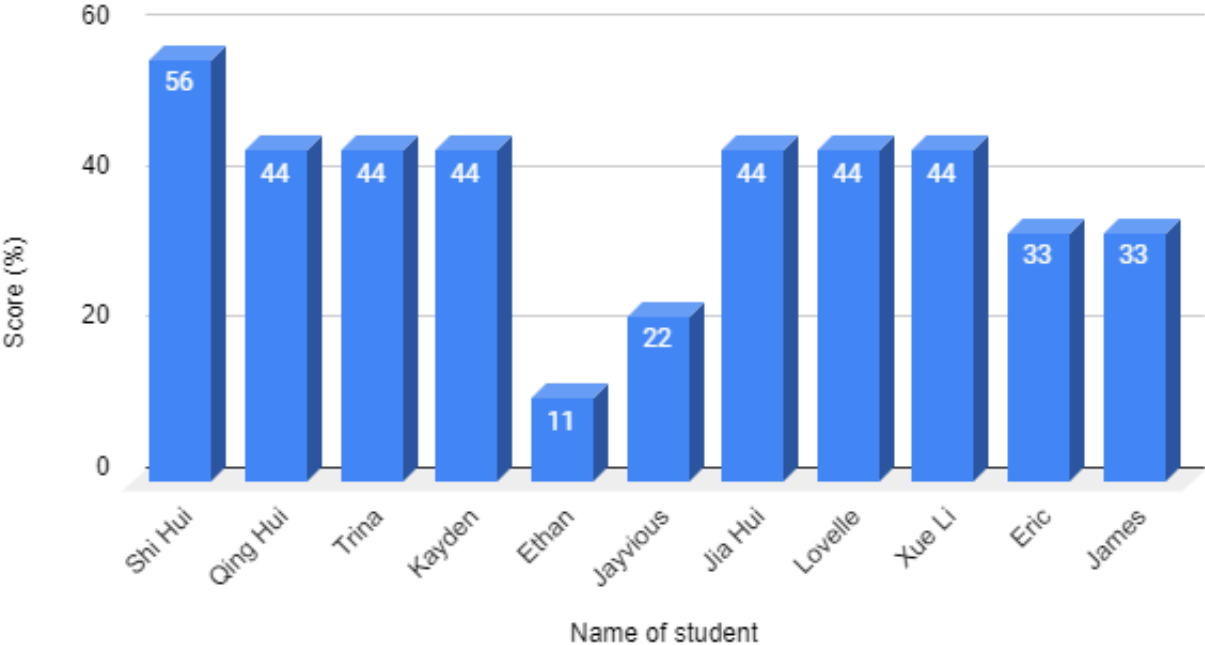
From 7-9 June, we partnered with Project Halcyon, which works with Care Corner to support and raise awareness for under-privileged children with learning difficulties. During the two-day coding workshop for the children at Care Corner, they were taught basic coding concepts as well as how to apply them by creating their own Scratch games.

2.3 Publicizing online resources

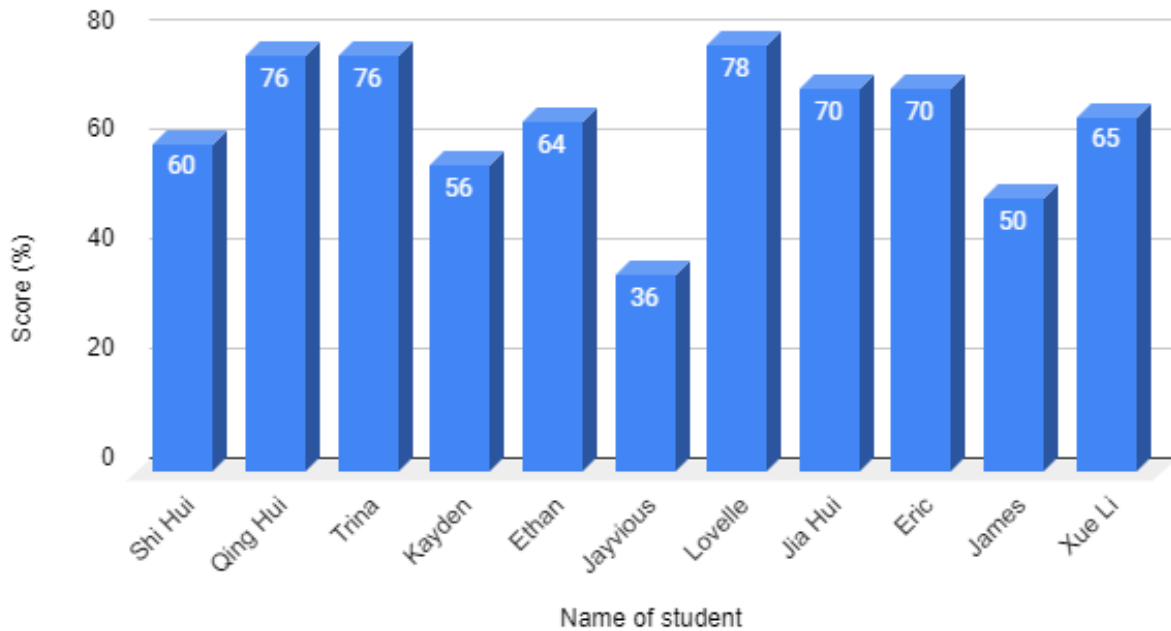
We made use of Instagram to extend our outreach to the public by publicizing our website on the platform. We have also reached out to CDAC to send out the link of our website to the children under their charge.

SECTION 3: PROJECT OUTCOMES

Kahoot Quiz 1 (After)

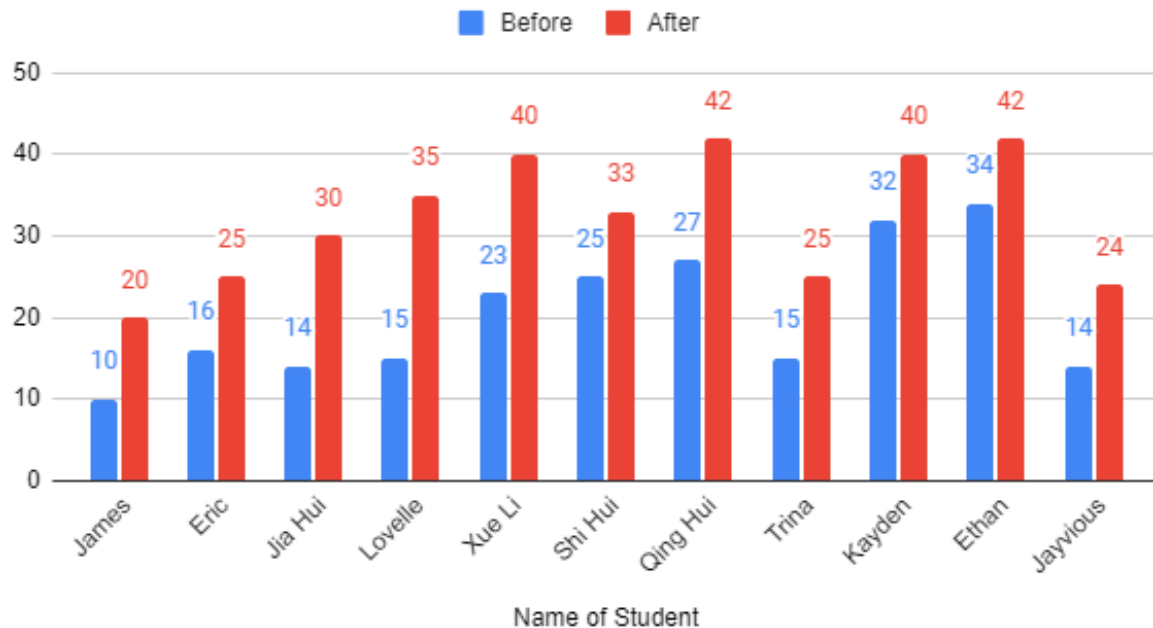


Kahoot Quiz 2 (After)



We conducted 2 Kahoot quizzes with the students during the first and last lesson respectively. In the first quiz, containing 12 questions on basic concepts, the average score was **38%**. In the second quiz, comprising of 25 questions on more advanced concepts, the average score was **64%**, an increase of close to **70%**.

Before and After: Typing Speed by WPM



We also measured the typing speeds of the students. After the Touch-Typing lesson module, the average increase in typing speeds was **12WPM**.

Here is a section of an interview that we carried out with Ms. Goh Yan Lin, the head of CDAC@Jurong.

Question: In your opinion, on a scale of 1-10, how beneficial has our coding and computing programme been to the children at CDAC? Why?

8.5. The programme provided a great opportunity for the student beneficiaries to **learn different IT knowledge that might not have been taught in school**. These knowledge would definitely be useful for the children to apply to their school projects in the near future.

3.2 Reflection

Over the course of the project, we not only learned to contribute as individuals, but also work together as a team. We gained deeper understanding of the difficulties faced by under-privileged children. Under Covid-19 restrictions, carrying out the project was not easy as we were forced to transition to online lessons. We had to improvise on ways to design interactive online lessons so as to keep students engaged. Comparing the results of the students before and after the programme, we were very heartened to see that they have benefited from the lessons, noting a major improvement in their understanding of coding and computing concepts. Over the course of 3 months, we were also able to connect with the students and forge bonds with them. Lastly, we will also work closely with the next batch of Project Digitalize members if possible and share with them valuable experiences and possible ideas to aid them in bringing the project to greater heights.

3.3 Scope of project

3.3.1 Community impact:

First, the CDAC students were able to learn essential coding and computing skills from the 3-month programme. The collaboration with Project Halcyon further enhanced our project's outreach, giving us the opportunity to interact with and teach students with learning difficulties at Care Corner. Lastly, we made the self-teaching website available to the public, giving those interested in coding and computing an accessible and efficient way to learn the basics and even grasp more advanced concepts.

3.3.2 Resolution of UP:

With this project, we could extend the opportunity of learning coding and computing skills to under-privileged children. We witnessed their improvement as well as their passion for coding. The self-teaching online resources are also made available to the public, enabling those interested to learn these skills for free.

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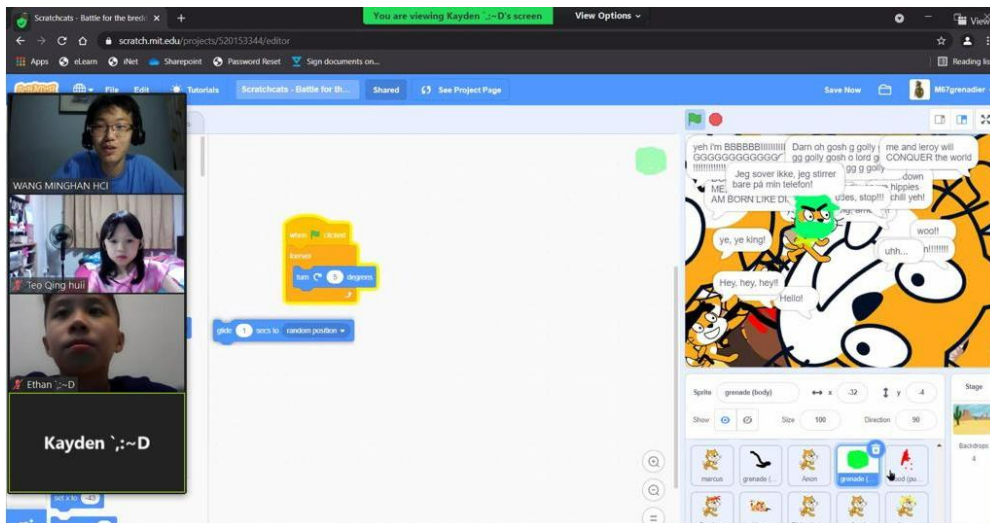
APPENDIX A: BIBLIOGRAPHY

- 1) Lauw, H. W. (2018, February 18). *Commentary: The hidden value of learning how to code*. Retrieved from <https://www.channelnewsasia.com/singapore/commentary-coding-programming-enrichment-classes-children-value-841971>
- 2) Dishman, L. (2016, June 14). *Why coding is still the most important job skill of the Future*. Retrieved from <https://www.fastcompany.com/3060883/why-coding-is-the-jobskill-of-the-future-for-everyone>
- 3) Hio, L. (2016, March 9). *Coding classes for kids in high demand*. Retrieved from <https://www.straitstimes.com/tech/coding-classes-for-kids-in-high-demand>
- 4) The Lab, S. (2020, February 10). *What is Code for Fun?* Retrieved from <https://www.thelab.sg/what-is-code-for-fun/>

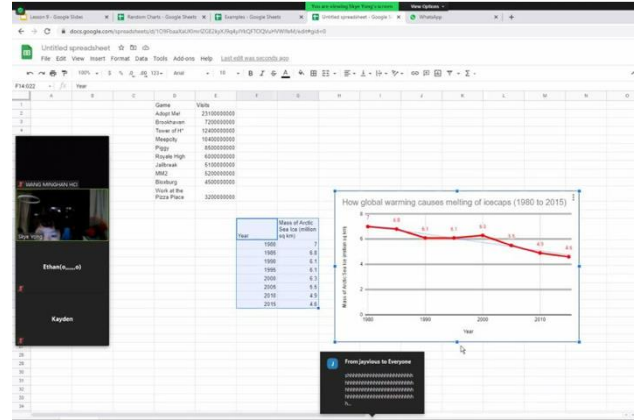
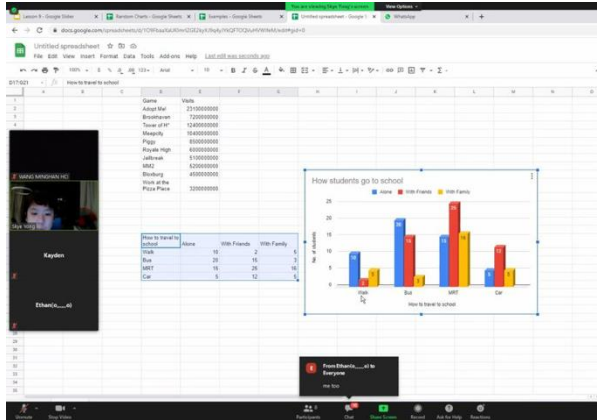
APPENDIX B: DOCUMENTATION OF PROJECT



Lessons 1-2 (Physical): Scratch movement blocks and costumes



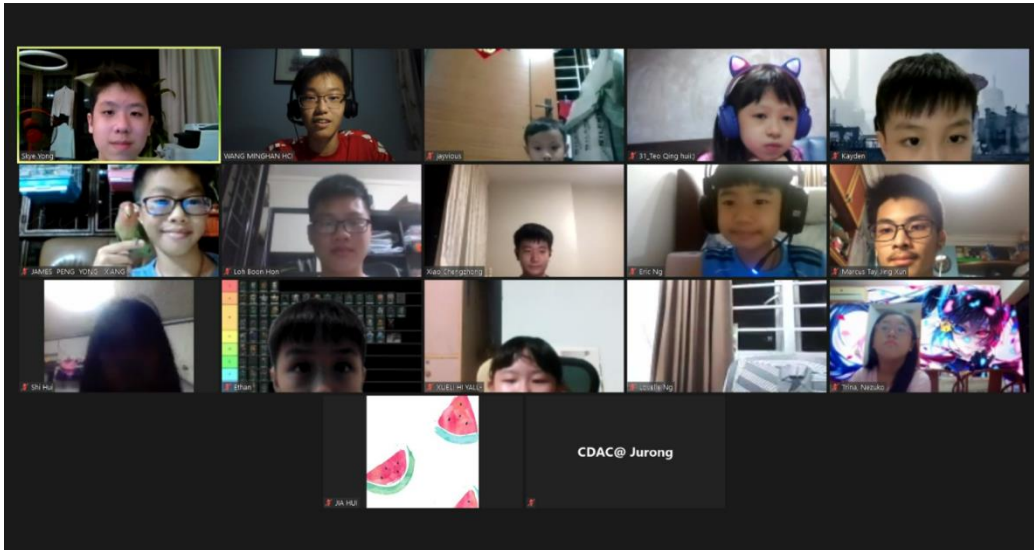
Lessons 5-6 (Virtual): Making of Scratch games, animations and math quizzes



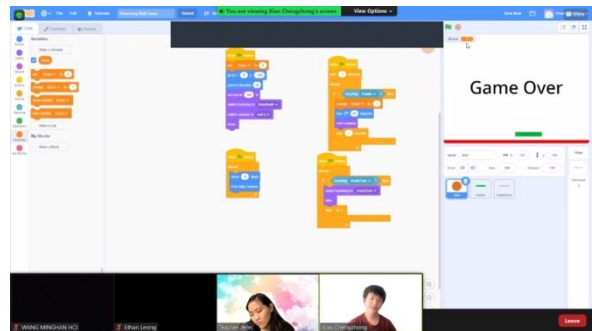
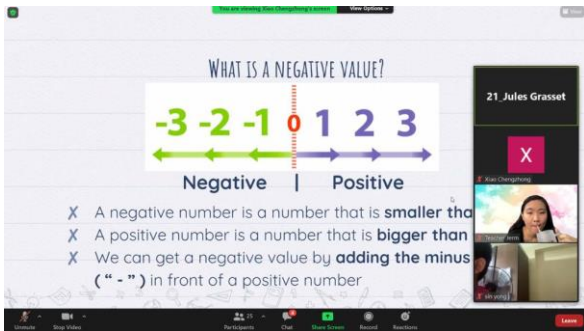
Lesson 9 (Virtual): Google sheet cell basics, application of formulas, charts and graphs

Lessons 10-12 (Virtual): Touch Typing activities and typing game Bomb Party

Kahoot Post-test



Final lesson: Group photo



Two-day coding workshop: Making of platform games, racing games, flappy bird and game physics (ex. Gravity)

APPENDIX C: DUTY ALLOCATION:

Member	Role
Skype Yong	Leader: Supervises entire project, communicates with beneficiary
Xiao Chengzhong	General Secretary: Plans project timeline, organizes lesson schedules
Wang Minghan	Publications: Manages Instagram account and online resources
Marcus Tay	Events: Plans and documents lesson activities

Loh Boon Hon	Logistics: Ensures availability of resources for activities, manages lesson logistics
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APPENDIX D: LINK TO ONLINE RESOURCE

<https://projectdigitalize.wixsite.com/digitalize>