

Group 4- 053

T.E.C.H. Written Report 2020

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Abstract:

Our project is a resource package aimed at equipping upper primary students with advanced coding knowledge (HTML and CSS) and cyber-wellness skills, through a series of interactive and engaging slides. The coding knowledge taught can be applied to creating websites from scratch, a skill that can be applied in the future.

1. Introduction

1.1 Rationale

We live in the 4th industrial revolution, where the use of Artificial Intelligence (AI) or algorithms are present in the computer or our daily tasks. There is an ever-increasing reliance on technology and it is imperative to teach younger minds to be competent in coding skills, and in the way they conduct themselves on the internet.

1.2 Objectives

To prepare upper primary students for the digital age by exposing them early to the knowledge of web (HTML and CSS) to pique their interest in coding and by teaching them to become a responsible cyber user. We aim to complement what the government is currently teaching, and to develop their passions through making the lessons more engaging and personalised.

1.3 Target audience

Our target audience is Upper Primary Students (P4 - P6).

1.4 Resources

We have created a resource package which comprises three interactive and engaging slides, focusing on the areas of web knowledge (HTML and CSS), and cyber-wellness related skills.

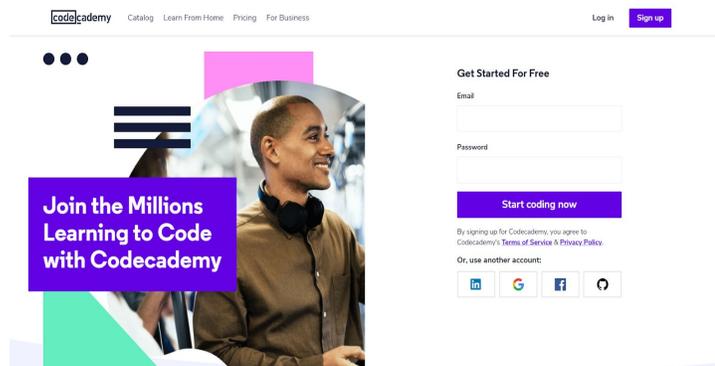
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2. Review

2.1 Existing Resources

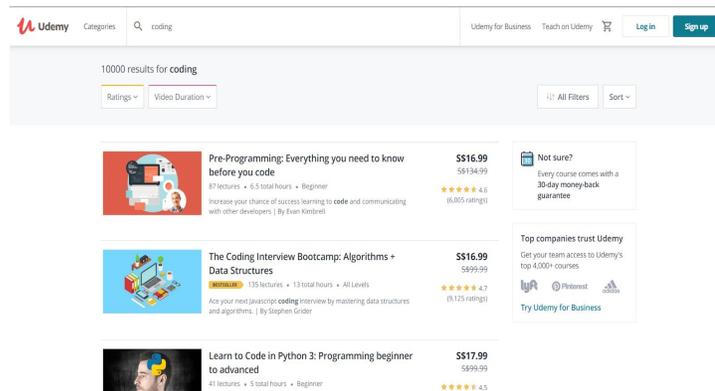
- Codecademy

The pace of the material is geared for beginners, so modules may seem pedantic. Free version adopts a one size fits all approach, thus may not be easily understandable for some people.



- Udemy

Most courses require a nominal fee for access, being business-oriented rather than teaching-oriented. Courses are also individual and do not link together.



- MOE (Code For Fun)

Aims to impart knowledge on computational thinking while barely touching the surface on coding itself, through the use of Scratch (scratch.mit.edu), involving the dragging of blocks to simulate code functions.



2.2 Comparison with Our Resource

- **Codecademy**

Our Resource Package contains both basic as well as advanced coding knowledge as well as more in-depth teaching. We also carry out face to face online sessions that allow us to adapt to the pace of the student and clarify their doubts for a more effective and efficient learning.

- **Udemy**

Our package is completely free with maximum effort, and we link all our lessons together to form one big picture for better understanding.

- **MOE (Code For Fun)**

This programme is rather shallow, and the block code used in Scratch is not reflective of coding in real life. Hence, while this is useful in piquing the interest of students, it is not as effective as exposing the student to actual coding, which we do.

3. Methodology

3.1 Needs analysis

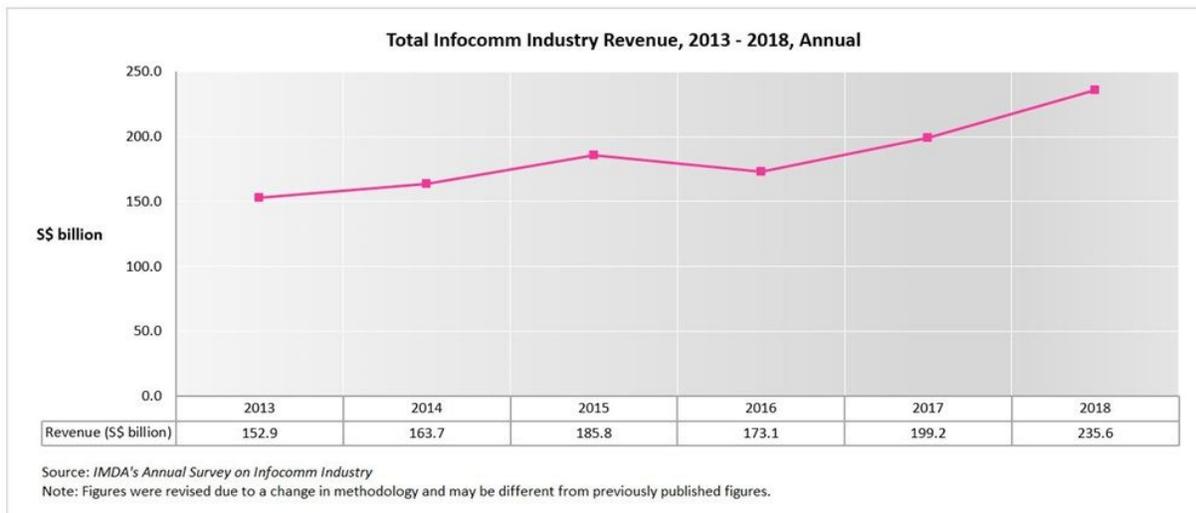
- **Infocomm Media Industry in Singapore**

According to a report in Nov 2017, the projected sector growth of the industry was 6% per year. By 2020, 16,000 jobs would have been created, 13,000 of

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which are professional, managerial, executive and technician roles (PMET) showing that Singapore's Infocomm sector is rapidly growing. As such, demands for high-skilled workers in this sector also increase.

- 1) Government is placing greater emphasis on Infocomm development, indicating greater future growth of this sector.
- 2) Equipping Upper Primary students with basic coding knowledge can spark an interest in coding and give a headstart in the Infocomm field, potentially providing them with better job opportunities in the future.



(Total revenue from the Infocomm Industry showing a sharp growth from 2013-2018)

- **School Cluster**

Researching South Zone Cluster 2, which consists of Blangah Rise, Fairfield Methodist, New Town, Pei Tong and Queenstown Primary Schools, we discovered that only 2 out of 5 of them have an Infocomm/IT programme. Furthermore, they only teach coding with Scratch, or how to use Microsoft to create slides and documents. None of them teach what is taught in our module; HTML and CSS, and learning how to make a website is not mentioned. Hence, there is a shortage of modules like ours in these Primary Schools, and our lesson package can help expose these students to these areas.

3.2 Development of Resources

- Sourcing for sources

After interviewing Ansel's father, who has prior experience in programming, we got a guideline on the key components of web knowledge, as well as suggestions on how to conduct the lessons, like using codepen.io to provide a hands-on experience without having to install an IDE (integrated development environment). He also suggested that we reference the documentation of HTML and CSS code from [w3schools.com](https://www.w3schools.com), the world's largest developer site, as it is commonly known for its concise and easy to understand explanations.

- The Resource

We decided to go with a hands-on approach, where we would design slides and teach them using Google Meet and Skype, placing more emphasis on clarifying outstanding doubts and correcting errors made on the fly. This would prove much more effective as the students would feel more engaged with how personal the lessons are. Every few slides, we would get the students to experiment with the different elements learnt, to make the lessons more engaging. At the end of every lesson, we would assign a larger-scale project to consolidate their knowledge and clarify any misconceptions or mistakes they might have made.

Block elements

Used as a container for text

No required attributes

When used together with CSS, it can be used to style parts of text

Example

```
<p>This is <span style="color:red;"> IMPORTANT</span></p>
```

This is **IMPORTANT**

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Syntax

What?

A CSS rule-set consists of a selector and a declaration block, with a few declarations.

Declarations always end with a semicolon, and declaration blocks are surrounded by curly braces

Example

```
selector(s) {  
    property: value;  
}  
  
h1, .h1 {  
    font-size: 16px;  
}
```

class attribute

What?

can be used multiple times within a web page, so the class selector is used to select a group of elements

Example

```
<h1 class="titles">  
a class name CANNOT start with a number  
  
<h1 class="names-1 names-2">  
HTML elements can have more than one class
```

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After developing the coding aspect of the resource, we included a segment to teach students about cyber-responsibility. After all, being prepared for the digital age is not just about learning how to code, but also about how to protect oneself from the many dangers arising from the internet. Making use of the slogan, “Be Kind, Smart, Safe”, we went in depth to teach the students more in these three areas, ranging from how to recognize and protect oneself from phishing scams, to issues like misuse of the internet and cyberbullying. Recognizing that students may not be interested in the lesson without any media, we made our slides more engaging and interactive through a series of photos and videos which are more relevant and would pique their interests. We also included a Kahoot quiz at the end, where they were pitted against each other in a fun and competitive manner.

How to tell between a joke and bullying?

- Jokes are OK among friends if it's just for the sake of fun and **no one takes offence to it**
- However there exists a fine line between a joke and bullying, even if friends sometimes laugh it off with a “just kidding”
- if you **feel hurt** or think others are **laughing at you instead of with you**, then the joke has gone too far
- Stand up to your friends and **let them know how you feel about it**
- If this still persists on, tell a trusted adult or break off contact with them

(Teaching the students more about cyberbullying)

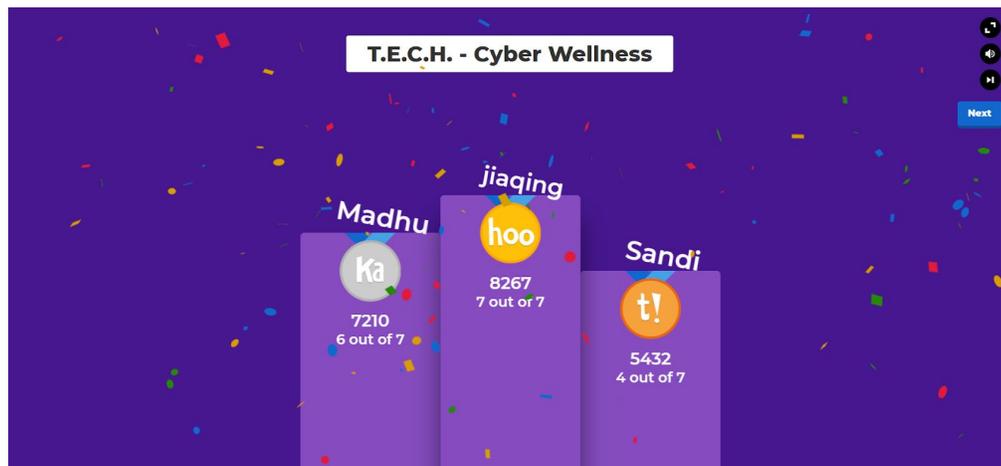
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(Interactive slides to test on the students' alertness to the signs of scams)



(Real-world examples like Amos Yee and Amy Cheong)



(Kahoot Quiz at the end of the lesson!)

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3.3 Pilot Test

- The Audience

Our original plan was to go to Queenstown Primary School to conduct physical lessons for the students. However, the worsening situation prevented such plans. Furthermore, the tighter restrictions implemented during the Circuit Breaker period and May School Holidays, such as the monitoring of live lessons (because of the zoom hacking incident), resulted in us not being able to conduct online lessons. Hence, we turned to alternative means of sourcing for students (i.e. relatives or friends/classmates), using the first session as a pilot test due to time constraints.

- Feedback

After the first session, we carried out a survey to gain insight into our strengths and shortcomings. The students generally enjoyed the engagement of the lessons due to how interactive it was, coupled with the humour. However, some felt the duration of the lesson was too long and hence the next session, we gave them a few recesses to break the lesson up into more digestible parts. Furthermore, we went into the first session with a general idea, but not a definite plan. The next session, we made a plan to follow before jumping into the lesson.

4 Outcome & Discussion

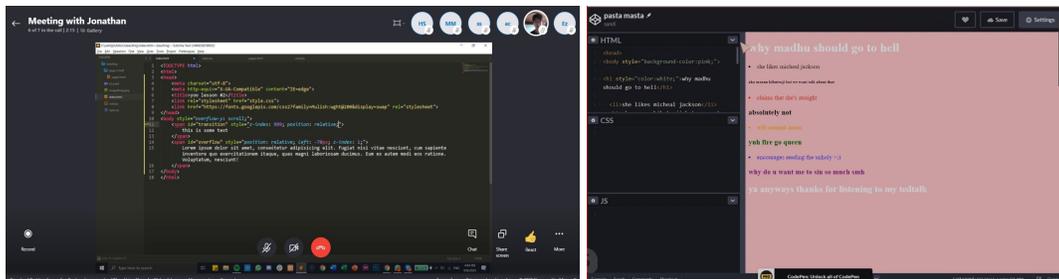
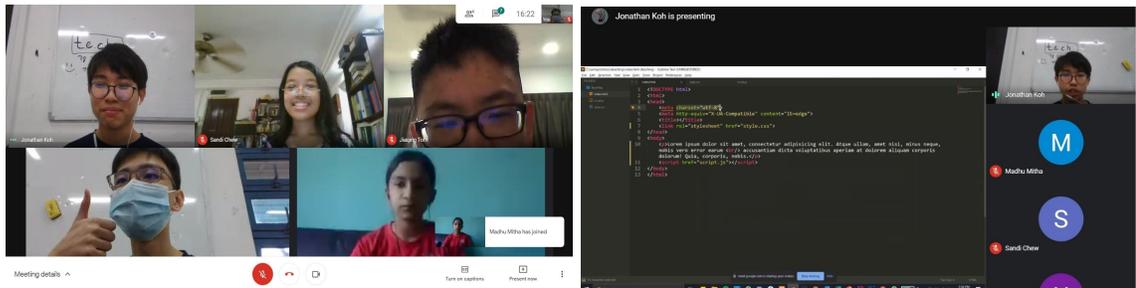
- Final Outcome

Our final product will be several sets of slides which focus on teaching basic HTML and CSS elements to Upper Primary Students, equipping them with the basic tools to create a website, as well as teaching them about cyber responsibility in order to protect themselves from the dangers of the Internet. These slides are made to be easily presented through the share screen function present in Google Meets, Skype and Zoom. Our package is more catered to

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online lessons because of the social distancing measures, which prevents us from holding the lessons face to face.

However, we placed more focus on the engagement aspect of the lessons. We allowed for a more informal tone and gave the students the freedom to inject their humour into their assignments, hence prompting them to be more interested in the lesson due to the interactivity.



(view the website at <https://codepen.io/sirsand/pen/JjXYNBy>)

Resources: <https://171433w.wixsite.com/website>

5 Conclusion

T.E.C.H was a very turbulent journey with many unexpected twists and turns. The original plan of physical teaching fell apart due to the coronavirus outbreak and the lockdown order. Then, we faced another roadblock when we were informed that setting up zoom meetings with the students was not possible, and we faced yet another roadblock. Eventually, we had to rely on our connections with friends and family to get in touch with a few students from Boon Lay Garden Primary School, so we could conduct our lessons and test our package. This project pushed us to innovate and think on our feet, adapt and improvise. Even during the lesson, we had to learn how to close the age gap and seem more engaging. In the end, our perseverance, innovation and quick thinking, as well as valuable guidance from mentor, Ms Elizabeth Lee, led to the successful completion of this project.

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