CATEGORY 4 RESOURCE DEVELOPMENT

4-069

PROJECT DIGITALIZE

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ABSTRACT

Project Digitalize is an integrated online resource aiming to spark primary school students' interest in coding as well as equipping them with essential computer skills. This resource provides a comprehensive, detailed, and simple-to-follow guide to teach young children basic programming and computer skills. The resource consists of a lesson site coupled with original videos which not only make the resource more interactive and user-friendly, but also makes it appeal more to young students due as simple language and visual components were used. The lesson site teaches the basics of Scratch programming, essential skills for Microsoft Office (Word, PowerPoint, Excel) as well as computer skills needed in daily life such as touch typing. There are also assignments and tasks which aim to assess the efficacy of students' learning, as well as give them opportunities to apply the concepts and skills learned.

1) <u>INTRODUCTION</u>

1.1 Rationale

In the 21st Century, technology will play a vital role in ensuring Singapore's growth as a country. Thus, it is crucial that our young generation is sufficiently equipped with skills to utilise technology such as coding and computing skills. However, many primary schools do not put much focus on teaching these skills to students, and only teach cyber-wellness and general online etiquette. Though coding classes are available to the public. they are not easily affordable. As a result, many primary school children are not exposed to the concept of coding and other essential skills, which is very worrying considering the increasing importance and relevance of coding as a skill in the future.

1.2 Objective

The resource aims to spark primary school students' interest in coding and programming as well as equipping them with essential computing skills to better utilise technology in the digitalized era.

1.3 Target Audience

Our target audience were Primary 4 students from schools that do not have coding and ICT programmes. The Ministry of Education implemented the "Code for Fun" programme in 2020, making it compulsory for upper primary students to learn coding.

As Primary 4 students are the first to encounter these new and unfamiliar concepts, we chose them as our target audience. Hence, the resource aims to help these students understand these unfamiliar concepts better and spark their interest in the field.

1.4 Our resource

Our resource is an integrated online lesson package which consists of 3 main sections, each covering Scratch programming, Microsoft Office (Word, Excel, PowerPoint) and touch typing respectively. The various videos created illustrate how different categories of code work in Scratch and show applications of coding concepts. For touch typing, video demonstrations were created to show the proper technique. For both the Scratch and Microsoft sites, we used organised and simplified language to explain concepts, and designed interactive assignments to give them opportunities to hone their skills and gauge their abilities.
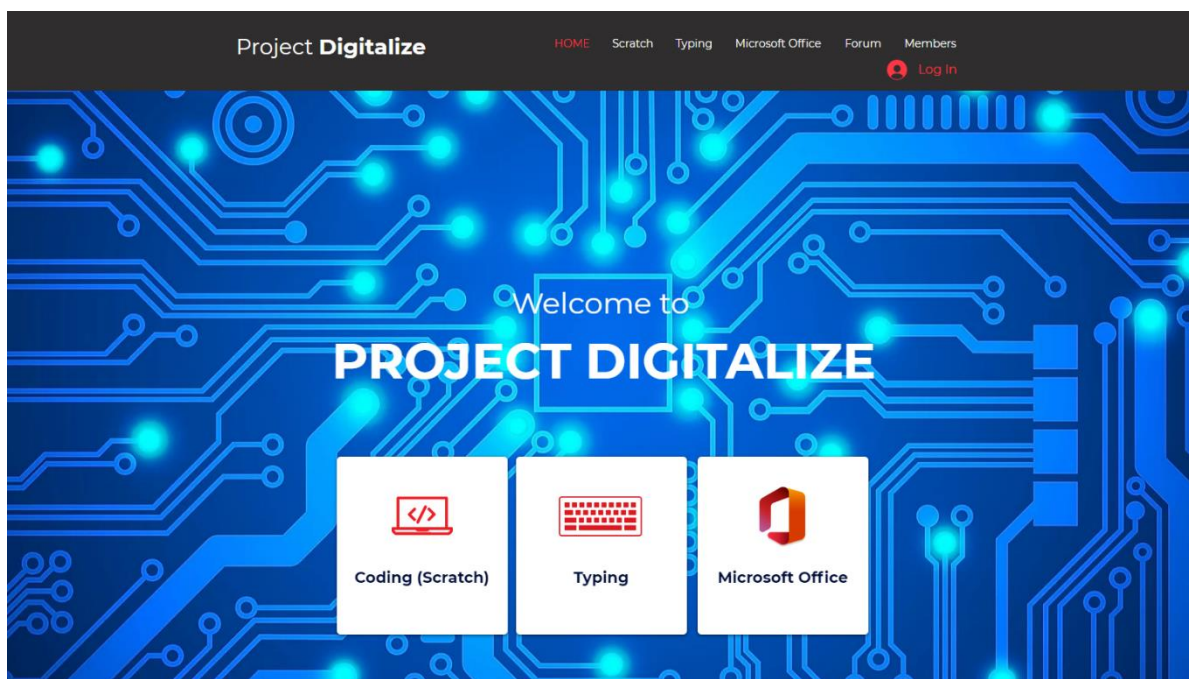
This is the main site for our online resource package, and it contains content on Scratch and touch typing. The Microsoft Office lesson site was created using Google sites, and is linked to this site as well. The Microsoft site not only provides clear and concise instructions on how to manipulate the various software and features, but also features the applications of certain concepts which relate to the lives of the students. The lesson site also provides some tips and advice from our own experiences of using the software. For instance, teaching students about basic PowerPoint presentation

skills and providing some tips on how to make a better presentation. This includes only focusing on main points during a presentation, avoid making wordy slides as well as using suitable font sizes to catch audience's attention.

2) REVIEW

2.1 Literature Review

Research was conducted to find out what experts and the Ministry of Education think about incorporating coding into the school curriculum. Research shows that the benefits of learning how to code is not limited to mastering the computer, but also gives students opportunities to develop problem-solving skills and divergent thinking. Coding also encourages "computational thinking", allowing students to think logically, apply algorithms as well as abstract and decompose information. Being exposed to coding also gives students the opportunity to consider a career in areas related to coding. Coding is gaining popularity as one of the key enrichment activities parents send their kids for and is also becoming increasingly important and relevant in the workforce.

2.2 Existing resources

Research was also conducted to find out about existing coding classes available to the public. Our research shows that weekly coding classes can cost from $300 dollars to $500 per month, while one-time workshops range from $280 to $1,400. These classes are very expensive and not easily affordable especially if a parent plans to send their kids for long-term classes. Thus, there is a need to create a resource for those who are interested in learning coding but do not have the means to afford classes.

3) <u>METHODOLOGY</u>

3.1 Needs Analysis

An online survey was carried out to justify the need for our project and determine the gaps in order to reach our desired goals. A quiz was also conducted to determine how familiar students were with coding and computing concepts. A total of 31 responses were collected. The survey results reveal that many students have insufficient knowledge on coding and computing concepts but showed a great deal of interest in learning such skills. These results clearly ascertain the relevance of our project, and at the same time provided valuable information to help put together the design of the resource.

3.2 Survey results

In your opinion, how good are you with skills such as programming and computing?

5
13.3%

1
3.3%

2
23.3%

4
30.0%

3
30.0%
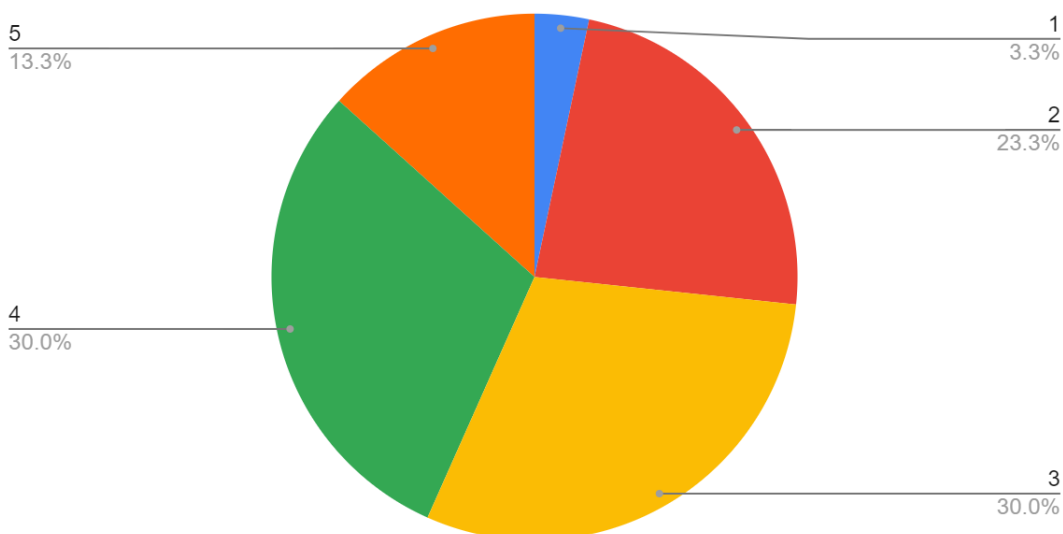
Are you interested in programming / coding? (Scratch, Microbit, etc)

- 1 — 9.7%
- 2 — 3.2%
- 3 — 19.4%
- 4 — 45.2%
- 5 — 22.6%
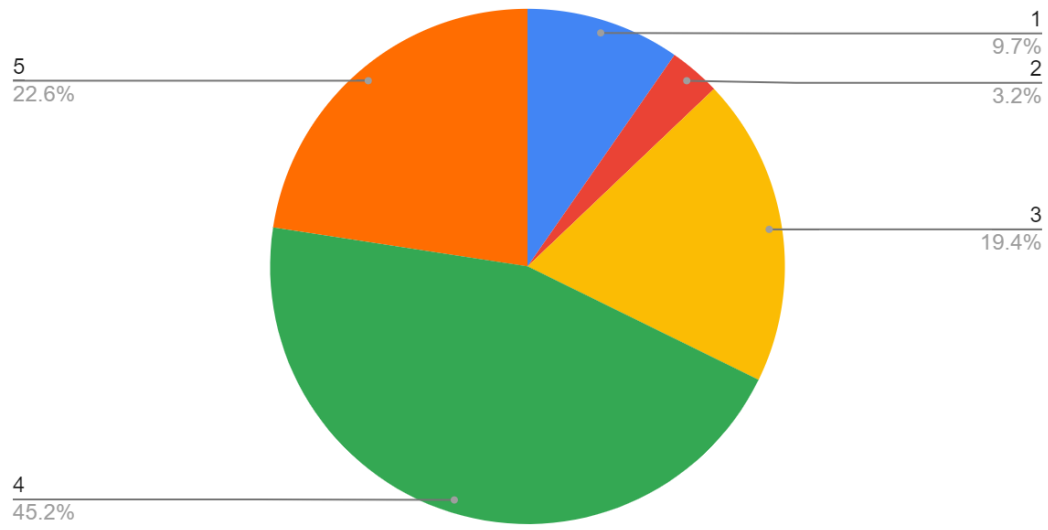
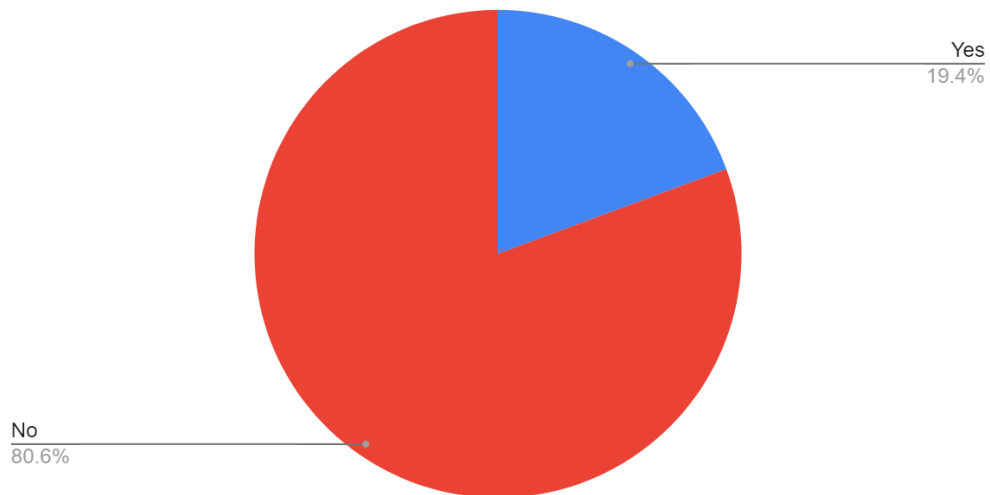## Are you interested in learning how to use advanced features of Microsoft platforms and tools? (Word, PowerPoint, Excel)

- 1 — 6.7%
- 2 — 3.3%
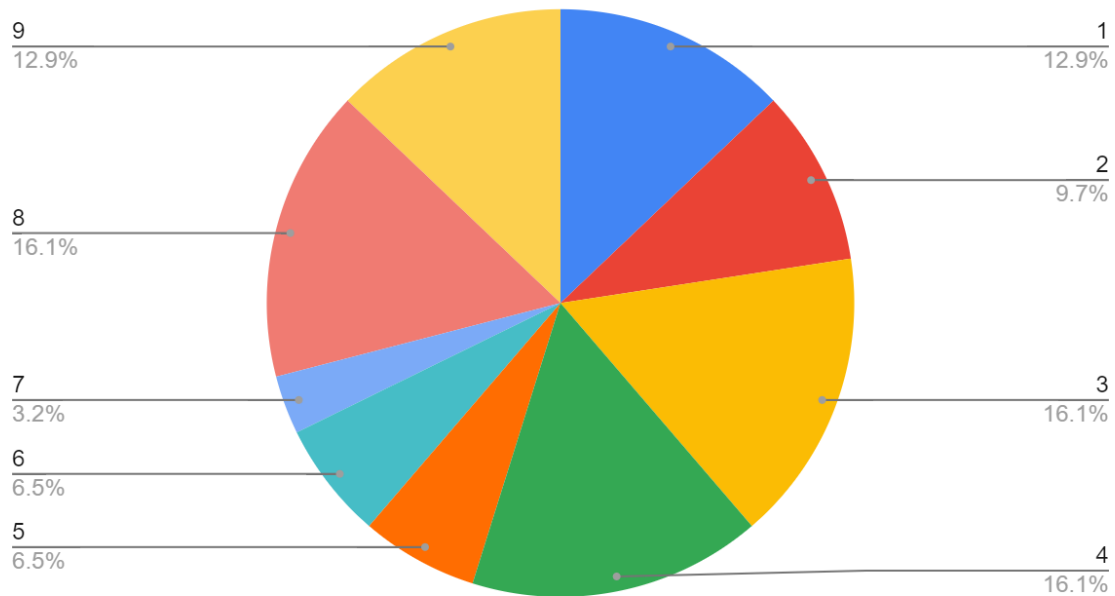- 3 — 10.0%
- 4 — 50.0%
- 5 — 30.0%
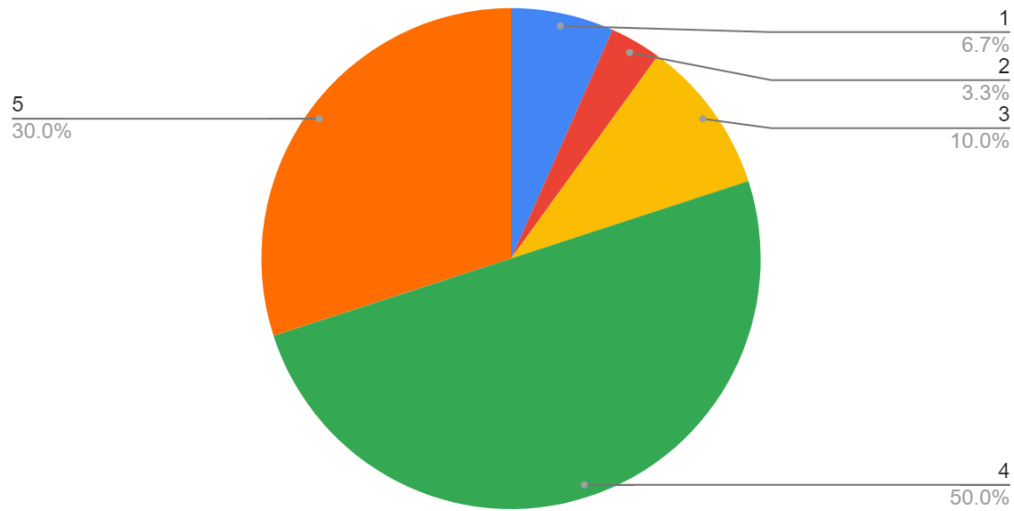
In your opinion, is your school teaching sufficient ICT content / material?

Yes
19.4%

No
80.6%
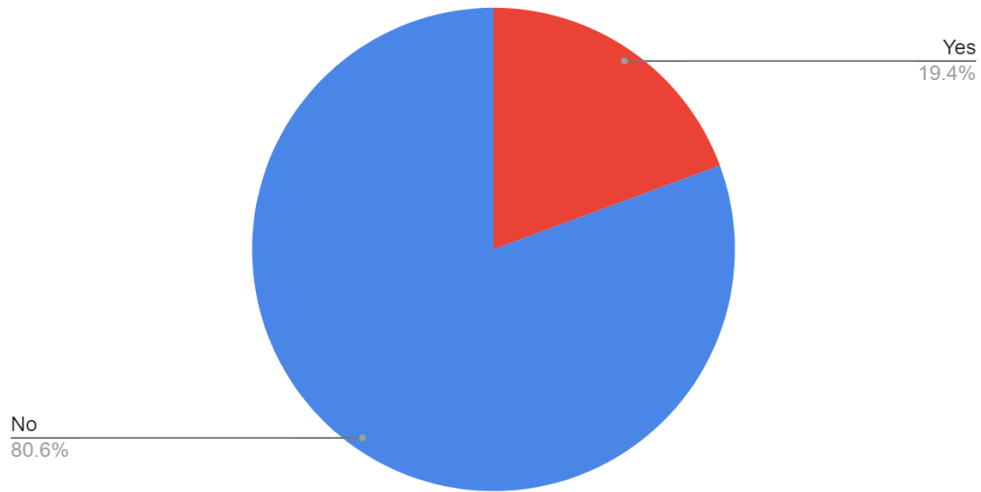
Do your parents send you to programming / ICT enrichment classes?

Yes
19.4%

No
80.6%

Quiz Score

3.3 Development of resources

The group researched and brainstormed on suitable concepts and skills to teach students so as to ensure our package can serve as a solid foundation for students who want to continue coding and applying computing skillsets in the future. Next, the group had to research, organise the information and simplify the language when explaining different concepts in the lesson package. Lastly, the group had to come up with ways for students to apply the concepts they learnt. After combining everything that was mentioned above, the group managed to create interactive activities, games and various tasks and assignments to make learning more enjoyable and effective for the target audience.

4) OUTCOME AND DISCUSSION

Mostly positive feedback was obtained from pilot-testing our resource, but there were some trends that the group had to take not of. Of all 3 areas covered in the package, the resources created for touch typing received the best reviews from the target audience. This is most likely due to the typing game that was created using Scratch which allows students to test their typing skills in a fun way.

Contribution to learning for each component

4.1 Limitations

The target audience of the resource is mainly students with no prior or little knowledge on computing concepts, thus the concepts taught are rather simple and basic. Because of this, the resource may not be beneficial for students who are already experienced with such concepts.

4.2 Improvements and future plans

The pilot-test results show that students are more attracted to resources that include interactive games. Thus, future resources created need to be more interactive and utilise the concept of game-directed learning. We plan on using this resource for a Service-learning project next year and may choose to target this resource to primary school children in student care centres (Such as "B Care" and "Big Heart" student care) instead. These children are generally less privileged children who may face financial difficulties, family problems, and lack education opportunities. We feel that targeting our resource to these children will be more meaningful and helpful to society.

5) CONCLUSION

The project had generally been smooth sailing, but the group was still met with certain challenges along the way. Firstly, the original idea of conducting physical lessons with the target audience was affected by the sudden outbreak of COVID-19. Thus, during the early stages of our project, much brainstorming, extensive planning and discussions had to be carried out to set the direction for the project. However,

this was no easy task considering the different commitments and responsibilities of different members. Secondly, because the resources cover a substantial amount of content, group members had to make time from their busy academic schedule to finish the project. The videos, from brainstorming and writing scripts to adding voiceover and video editing, were especially time-consuming.

This project has been an extremely fruitful and enriching experience. Through this year-long project, every member learnt to think creatively and picked up collaborative skills. Not all group members were tech-savvy when we first embarked on this project, and different members excelled in different areas. But in the process of creating this resource, members learnt various new skills from one another and after the final product was completed, every member was well-equipped with knowledge in all fields.

Links to resources:

https://projectdigitalize.wixsite.com/digitalize

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