



Written Report

Group 09-05

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1. Introduction

1.1 Description of project

Our project features SAFE@HCI, an app that mainly helps to ensure the safety and well-being of the students and teachers in HCI. This app can help the teachers mark attendance, remind and ensure that everyone in the school has finished their Safe-entry, remind everyone to wipe down, allow the teachers to take down the students' health and travel history for contact tracing purposes.

1.2 The Rationale of our Project

Currently, amid the battle against COVID-19, a lot of safety measures have to be put in place, for example, we have to wipe down wherever we go, we have to check-in for contact tracing purposes, we have to take temperature daily to make sure of our well-being, lastly, students also have to tap our student card to mark attendance every day, while teachers have to ensure everyone's attendance.

1.3 Focus and importance of project

SAFE@HCI is not only to provide a quick and convenient solution to allow students to better conduct safety measures put in place during this COVID-19 situation but to provide a solution to all of the problems more effectively and efficiently. It can also allow the teachers/CMC to save time on checking the rest of the class's temperature, Safe-entry. SAFE@HCI also acts like a recording system where you can view data for the past 14 days or more from the database.

1.4 Scope of project

SAFE@HCI is mainly targeted to facilitate the well-being of fellow Hwa Chongians by allowing them to easily mark their attendance, give daily reminders for wipe down, record down the daily temperature of students and allow teachers to access the app to mark students attendance and check on students wellbeing.

2. Literature review

2.1 Case Studies

As we all know, the coronavirus and its many variants have affected society greatly. For example, as of the 3rd of August, there have been more than 199,645,100 cases and 4,250,200 deaths in the whole world because of the coronavirus. (“COVID-19 Coronavirus cases”, Worldometer) Thus, to keep the community safe, we need to maintain at least a 1-metre distance between ourselves and others to reduce our risk of infection when they cough, sneeze or speak, make wearing a mask a normal part of being around other people, regularly and thoroughly clean our hands with an alcohol-based hand rub or wash them with soap and water and many more. (“COVID-19 advice for the public”, World Health Organisation)

One of the more critical actions we must take is to play a part in helping the government with contact tracing, a key aspect to keep our country safe as doing this can swiftly stamp out any possible clusters. Thus, the government implemented the SafeEntry system, where individuals are required to use their mobile phones to scan QR codes and enter some personal information. This way, they can be alerted if an active carrier happened to be in the same spot at the same time. This is combined with the TraceTogether program, which uses a smartphone application or portable electronic tokens to track close encounters between people using Bluetooth wireless technology. In school, all students, staff and visitors are expected to use the TT App or Token to check-in too. (“FAQ, COVID-19 Related Matters”, Ministry of Education) (“How Singapore fights COVID with contact tracing”, NikkeiAsia)

2.2 References to support issues raised

Detailed references can be found in **Section (7) Bibliography**.

3. Study and Methodology

3.1 Ideation

Our group got the idea in school. Every day, the class monitor had to take the temperature of everyone and submit it to the form teacher. It was very time consuming and troublesome for him. Furthermore, we also observed that some students would forget to wipe down their tables. Sometimes some of our classmates will forget to tap our cards on the tap reader to mark our attendance. Our app provides a solution to solve these problems.

3.2 Investigations of people's needs

The survey we conducted, with a total of 28 respondents, showed that 53.6% of the respondents forget to wipe down their tables, 60.7% of the respondents prefer marking their attendance on their phone than tapping their card on the card reader, 75% of respondents think that it is time-consuming for the class monitor to record temperatures every day. Overall, 92.9% of the respondents like our app very much. (Survey charts in Annex B)

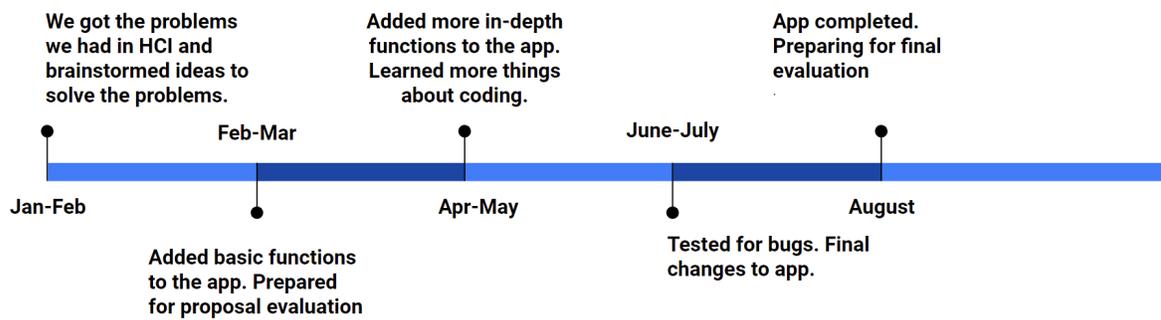
3.3 Development platforms

| Tool | Description | Rationale |
|-----------------------------|----------------|--|
| Flutter | UI Toolkit | Flutter can develop iOS and Android apps using the same programming language, Dart, with great UI. |
| Cloud Firestore | Database | Simple and easy to use as a database. Stores thing systematically and help greatly with our project |
| Firebase Authentication SDK | Authentication | Since we were only using Google Sign In, it was much easier to implement due to the pre-available Google Sign-in page (See Fig 8.2 for more) Acted as an excellent security system as we could link the Cloud Firestore to Firebase Authentication to allow only those that are logged in to view the data from Cloud Firestore. |

3.4 Job distributions

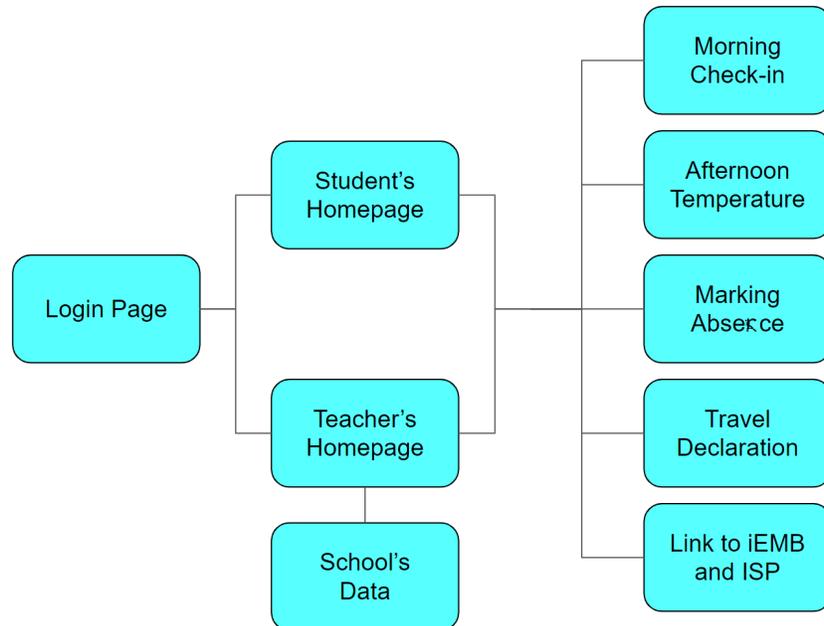
| Members | Job roles |
|------------------|--------------------------------|
| Jun Hao (Leader) | Main Programmer |
| Darryl | Presentation / Report Writer |
| Caelan | Side Programmer/ Report Writer |
| Rylie | Presentation / Report Writer |

3.5 Project timeline



4. Outcomes, analysis and descriptions

4.1 Flowchart of app features



4.2 Overall features of apps

1. Attendance
 - a. Students will have to complete a Morning Check-in every day whereby they would need to mark their attendance on the app.
2. Notifications for wipe down
 - a. Every Morning At 7.30 am, students will be reminded to wipe down their tables through the sending of a notification.
3. Temperature Recording
 - a. Every day at 7.30 and 1 pm, students will be required to take down their temperature on the app. They will also be reminded through the pushing out of notifications.
4. Safe-Entry Check
 - a. Students will be asked to upload a snapshot of their safe entry onto the app whereby the app will scan the snapshot for relevant keywords. Students can also opt for the option where they have tapped their trace-together token.
5. Travel Declaration
 - a. Students can manage their Travel Declaration. They can add, check and delete their declaration.

6. School's data (Teachers only)

- a. Teachers can check the school's data from their app. For example, they can check who has done their Morning Check-in, who has not, and who is absent.

5. Implications and recommendations

5.1 Area of improvements

Right now, the app is only available and designed for Hwa Chong Students. If we can widen the scope so that students and teachers from other schools can use it, that will benefit the rest of the people. However, that would be difficult such that it will be difficult for us to differentiate teachers and students. Thus, we need to create a bigger database for more students to use. Keeping more students data, allowing for more students to use the app to check-in although they are in different schools.

6. Conclusion

6.1 Reflections and learning points

Jun Hao: I feel that I have accomplished taking up a new programming language and learning it within 6 months. I have learnt a lot about coding and look forward to future opportunities to boost my coding skills.

Darryl: From this project, I have learnt that coding is not as easy as it may seem. At first, I would think that typing in instructions for the computer is using literal meaning, such as typing in the computer and asking them for their name. However, after this project, I learnt that coding is very much more complex and interesting. We also must work as a group and cooperate to get our project work done properly whilst handling our academic work.

Rylie: From this project, I have learnt that programming is not very easy, just coding a simple app like this takes months just to get the prototype, and then we have to go through trial and error to find a perfect and final product. I also learnt that we each have to learn more about coding to more efficiently work on projects like this next time.

Caelan: From this project, I have learnt that teamwork is significant in completing the project, especially when we have to cope with academics as well. Also, many problems will surface during the process, so we will have to work as a team to figure out a solution. Overall, this experience has made me realise the importance of teamwork.

7. Bibliography

7.1 Citations

- a. COVID-19 Total Cases Live Update, WorldOMeters, retrieved on 3 Aug 2021, from: <https://www.worldometers.info/coronavirus/>
- b. Advice for the Public, WHO, retrieved on 3 Aug 2021, from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>
- c. COVID-19 FAQ, MOE, retrieved on 3 Aug, from: <https://www.moe.gov.sg/faqs-covid-19-infection>
- d. Singapore contact tracing, AsiaNikkei, retrieved on 3 Aug 2021, from: <https://asia.nikkei.com/Spotlight/Coronavirus/How-Singapore-fights-COVID-with-contact-tracing-5-things-to-know>
- e. Flutter Documentation, Google, from: <https://flutter.dev>

8. Annex A

Login Page

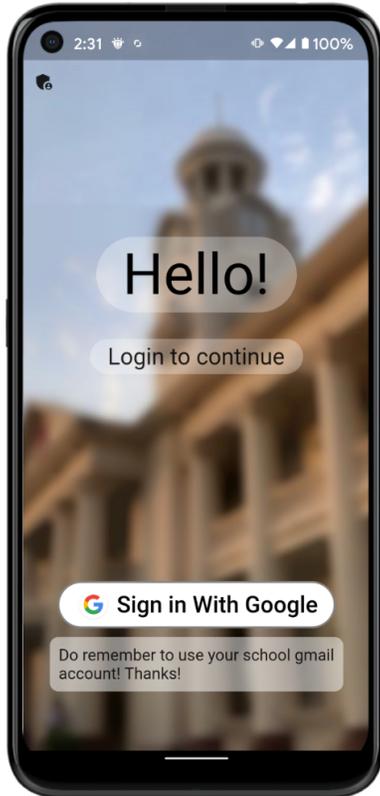


Fig 8.1: Login Page

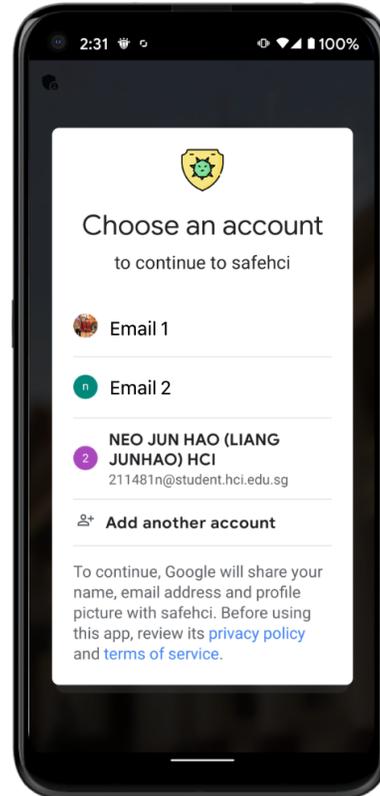


Fig 8.2: Google Sign-in. Denied entry if the user uses his personal email. Separates students and teachers into their respective homepages

Student's Homepage



Fig 8.3: Student's Homepage

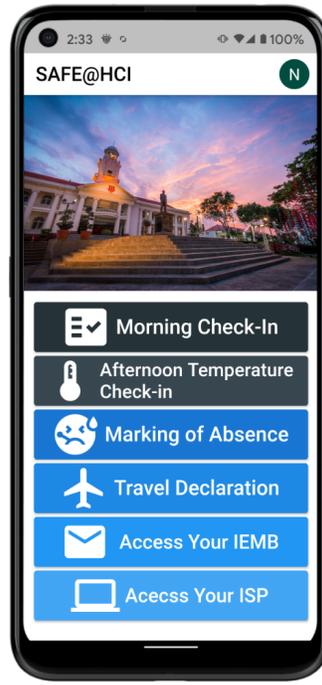


Fig 8.4: Student's Homepage after completed both Morning Check-in and Afternoon Temp

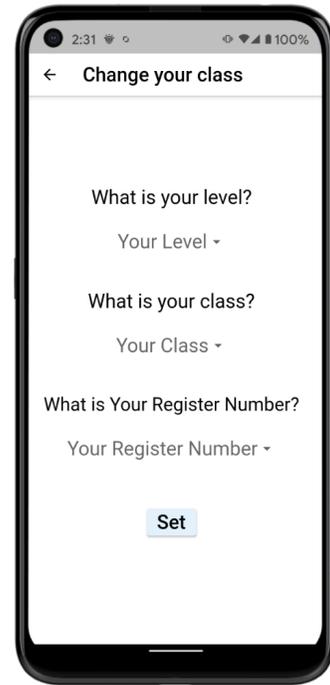


Fig 8.5: Settings for students to change their class and register number. They can help their friends do the Morning Check-in

Morning Check-in (Both Students and teachers)

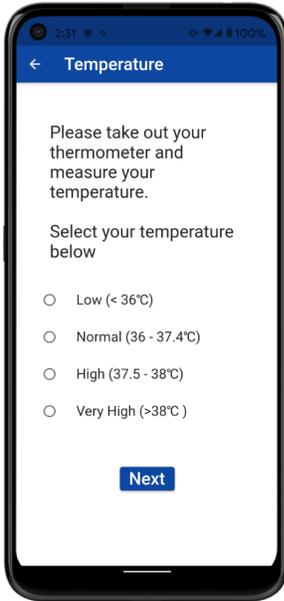


Fig 8.6: Checking of temperature

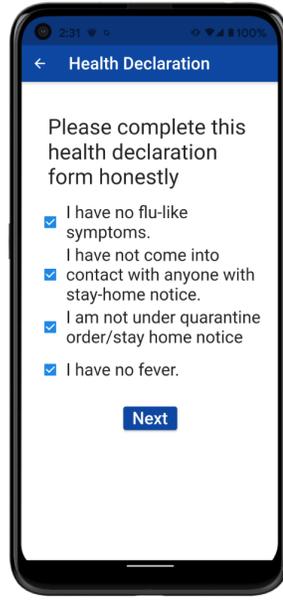


Fig 8.7: Health Declaration

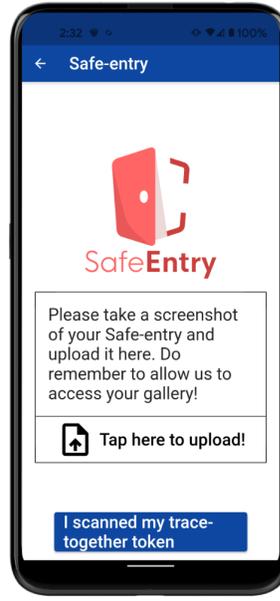


Fig 8.8: Uploading Snapshot of Safe-entry Check-in

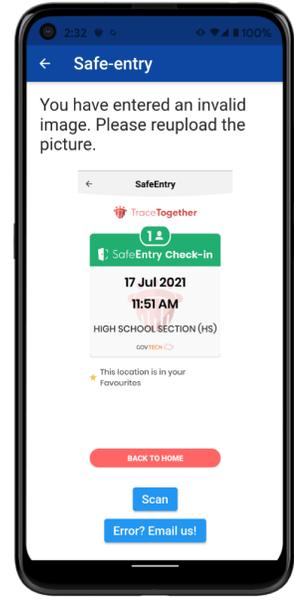


Fig 8.9: Checking of Safe-Entry Snapshot (Above has the wrong date)

Afternoon Temperature Check (Both Students and teachers)

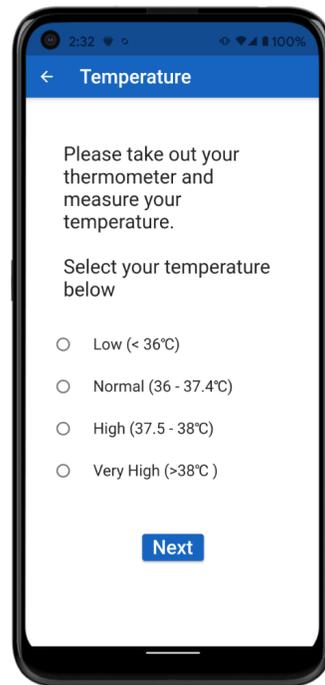


Fig 8.10: Afternoon Temperature Check at 1 pm

Marking of Absence (Both Students and teachers)

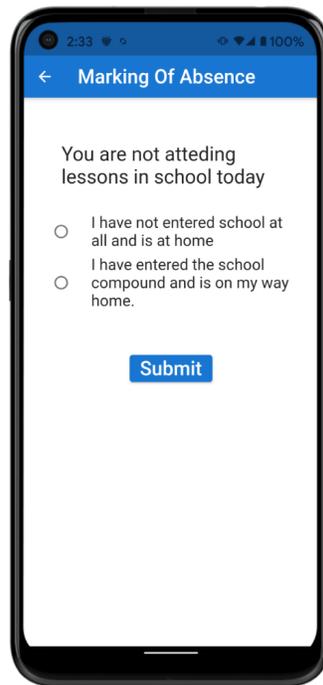


Fig 8.11: Marking Absence

Travel Declaration (Both Students and teachers)

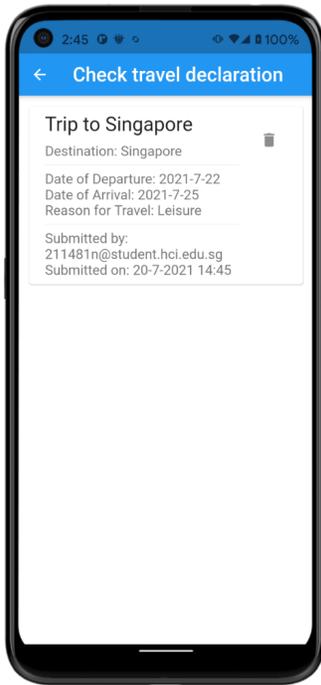


Fig 8.12: Check Travel Declaration

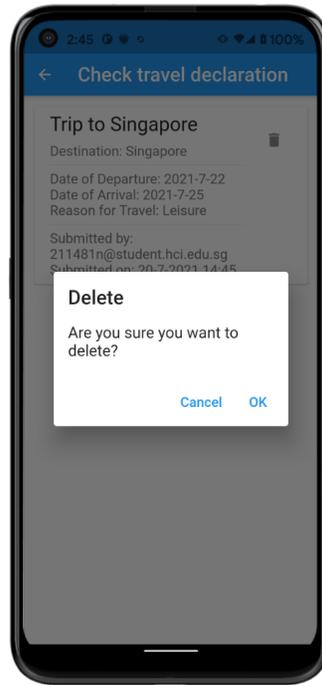


Fig 8.13 Delete Travel Declaration

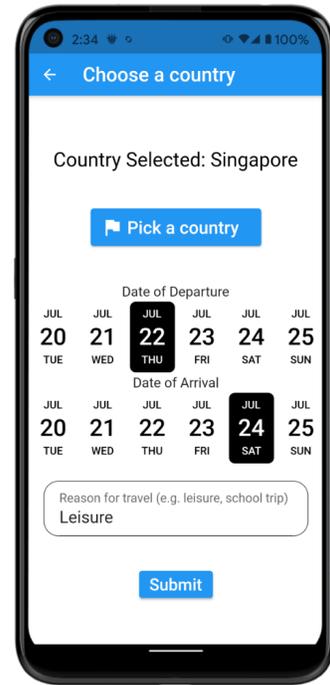


Fig 8.14: Add Travel Declaration

Teacher's Homepage

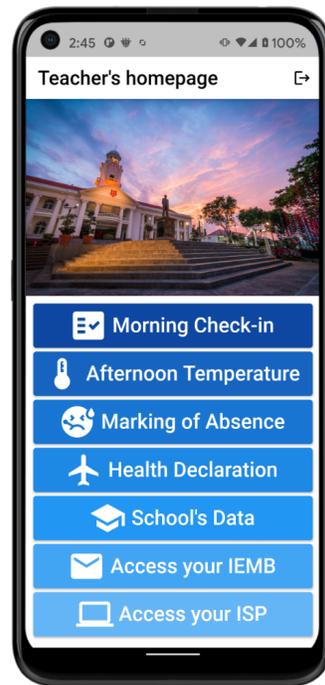


Fig 8.15: Teacher's Homepage (No changing of register no. and additional School's data)

School's Data (Teachers only)



Fig 8.16: School's Data Morning Check-in. Allows Filter.

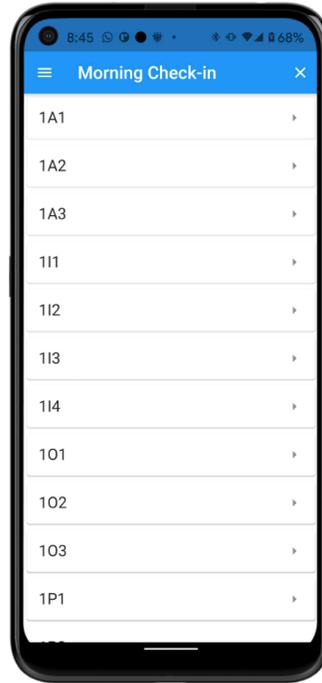


Fig 8.17: School's Data Absentees



Fig 8.18: School's Data Travel Declaration

Note: The teacher's data is similar to the ones above.

Notification

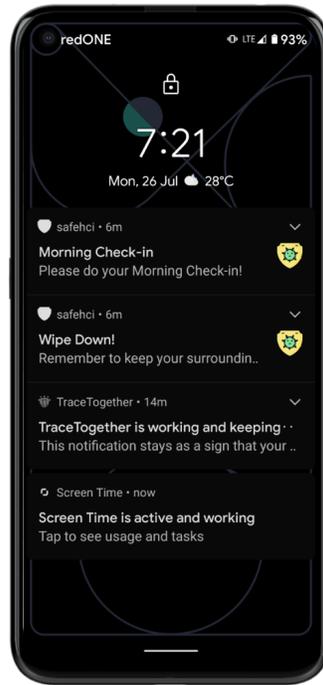


Fig 8.19: Notifications

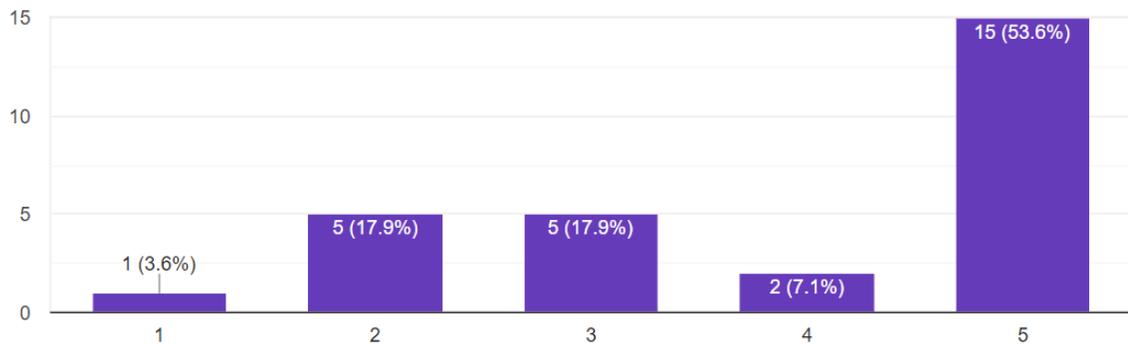
9. Annex B

Survey Results

On a scale of 1 to 5, how likely are you to forget to wipe down your tables every day?



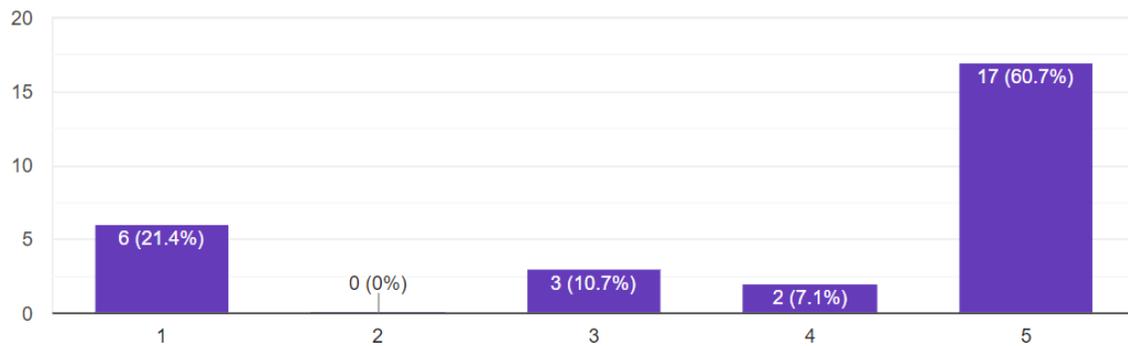
28 responses



On a scale of 1 to 5, how much would you prefer to mark your attendance on your phone instead of tapping your card?



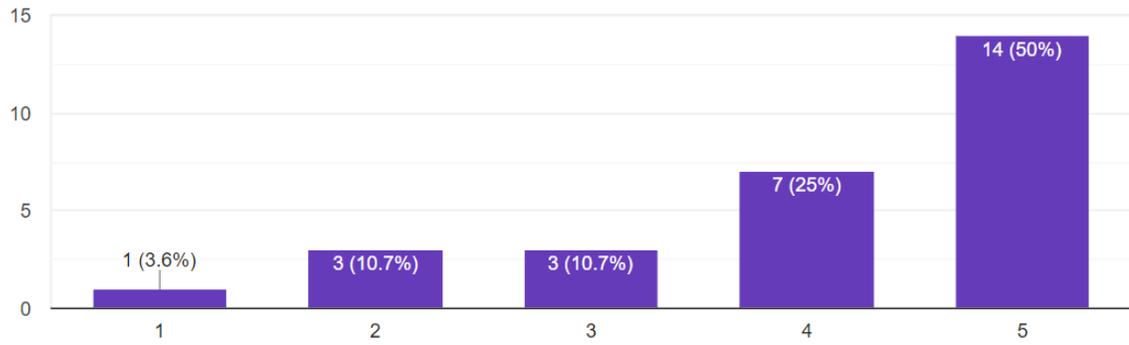
28 responses



On a scale of 1 to 5, how time consuming do you think it is for your class monitor/teacher to make sure everyone takes their temperature and does their safe-entry?



28 responses



On a scale of 1 to 5, how would you like an app that does all of the above?



28 responses

