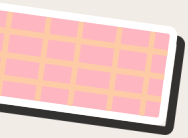
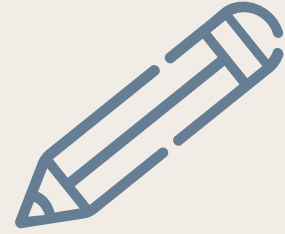


National Design Project Proposal 2023



By: Wee Jun Kai Lucius, Tu Ee Ninn Lyvia, Xie Xin Ru, Chai Yu Lei, Jomond Aw.
~Regent Secondary School~

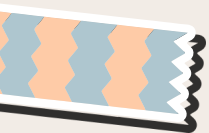


Problem statement and overview

- Students lose their valuables in class or when they move to different locations for different lessons

Who are the ones that are facing this problem (target audience)?

- Secondary school students who have more valuables such as PLDs, mobile phones, wallets etc...



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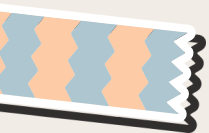


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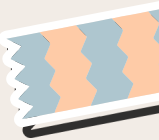
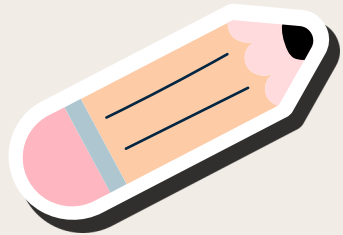
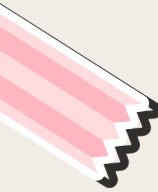
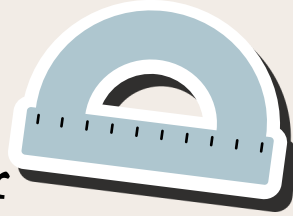
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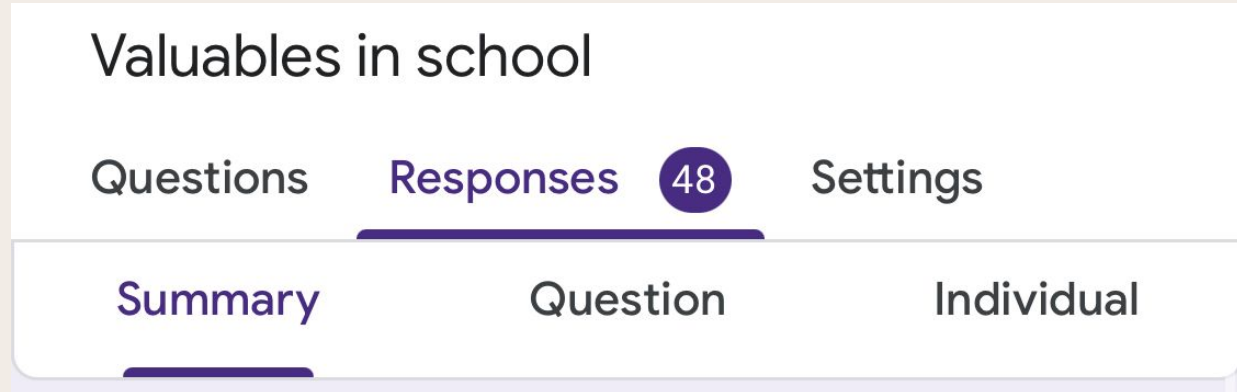
Why is this problem important to solve?

- This problem is important to solve because students can lose their valuables in class, or damage them accidentally. They have to go through many troubles when they lose their PLDs or valuables. If the problem is solved, they will be able to take their things conveniently and quickly without much worry of their items being lost or misplaced.

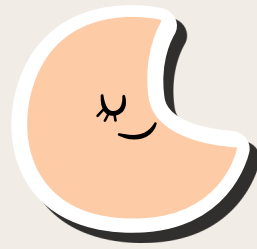


The magnitude of the given issue (Research)

- We conducted a survey with students from our school and some from other schools on losing valuables in school. The results of the survey were shocking and the problem was more severe than we thought.

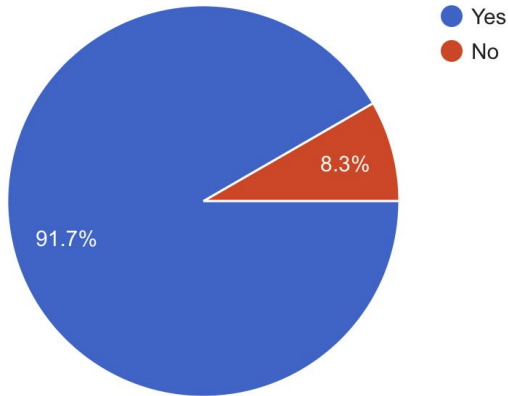


The results of the survey



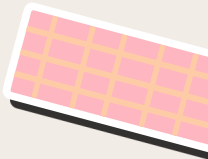
Have you ever lost your valuables in school before?

48 responses



Shockingly, the results revealed that more than 90% of students has lost their valuables in school before.

Be it theft or sheer carelessness, this is a rampant issue in the students of today. It is especially concerning as such valuables can cost hundreds of dollars.

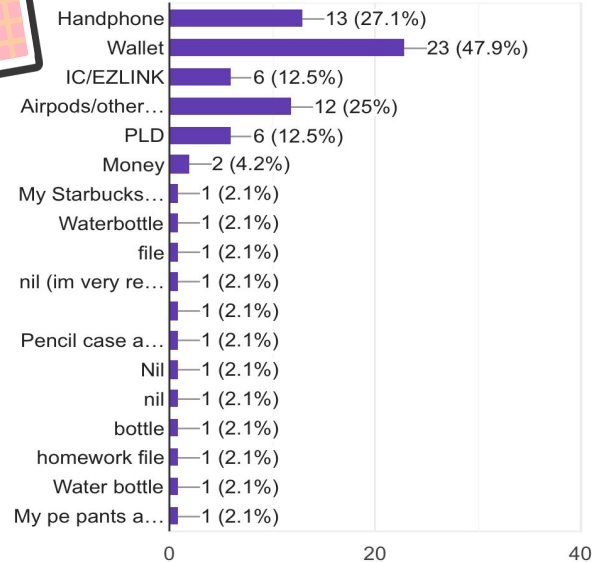


Results of the survey: Items that are lost

What are the valuables that you've lost?

 Copy

48 responses



From this bar graph, it is obvious that many students have lost their handphone, wallets and EZLINK cards, as well as money and airpods.

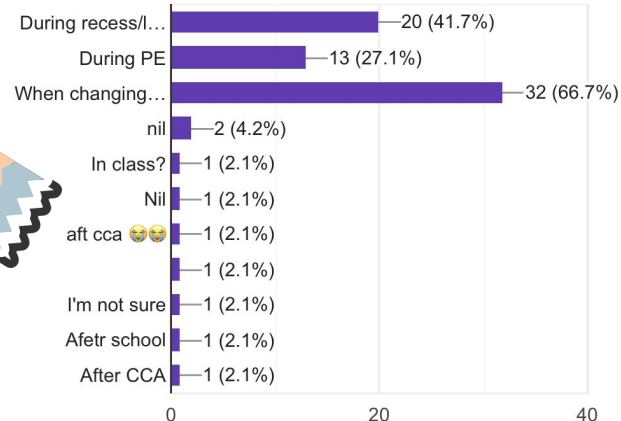
Alarmingly, more than 12% students also lost their personal learning devices (PLDs) which costs about S\$400 to purchase and is used throughout their secondary school life. Losing the PLDs can bring about many inconveniences, not only to students but also teachers and concerned parents.

Results of survey: When do students lose items?

When did you lose your valuables in school?



48 responses



From the chart, it is seen that students lose valuables most commonly during transition of classrooms. This broadens the scope of the issue as schools are rolling out Full Subject Based Banding (FSBB), requiring students to change to their banded venues for each lesson. This means that in the near future, more students are likely to lose their valuables or PLDs.

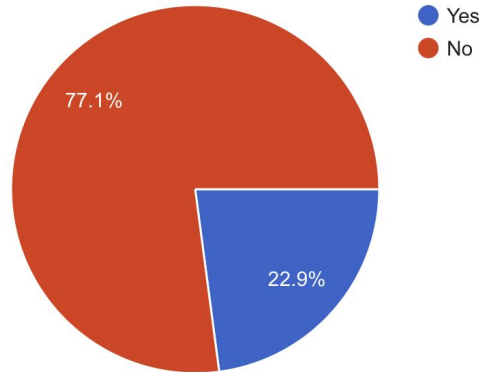
Analysis of survey results

Students are not taking good care of their PLDs

Have you ever damaged your PLD before?

 Copy

48 responses



From the survey, it is apparent that students lose their valuables, meaning that they do not take good care of them.

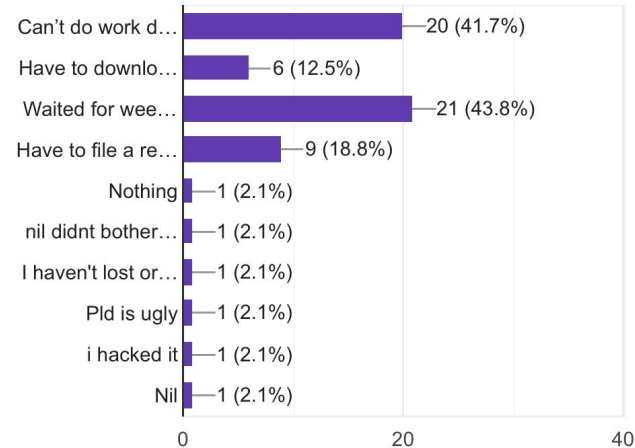
From this chart, we see another issue. It is that students are not taking care of their PLDs. About 1 in 5 students has damaged their PLDs before. This also brings about many inconveniences and much frustration.

Analysis of survey results

Inconveniences of losing PLDs for students

What are the inconveniences of losing or damaging your PLD?

48 responses



- 1) Can't do work online during HBL (home-based learning)
- 2) Have to download educational apps on personal phone, wasting precious storage space
- 3) Waited for weeks for PLD to be replaced, hindering learning
- 4) Go through the hassle of filing a report to the school

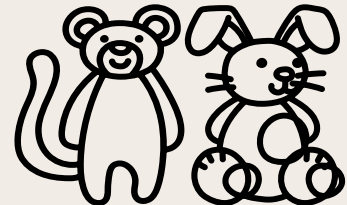


Analysis of survey results



Inconveniences of losing PLDs for Parents

- 1) Have to fork out a hefty sum of S\$400 for a replacement of PLD
- 2) Go through the hassle of filing a report to the school
- 3) Stress and worry of child lacking behind during HBL or in other PLD aided learning such as on online platforms like SLS (student learning space)
- 4) It is not easy to buy another PLD fast





Analysis of survey results

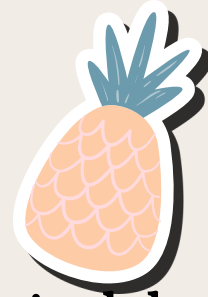
Plethora of inconveniences of students losing PLDs for Teachers



- 1) Can't assign work online during HBL (home-based learning)
- 2) Have to print hard-copy work for the student
- 3) Have to chase students to complete online assignments
- 4) Have to reset student account passwords when they forget after waiting for weeks for PLD to be replaced
- 5) Go through the hassle of filing a report to the school
- 6) It is very inconvenient for teachers to carry out lessons using PLDs



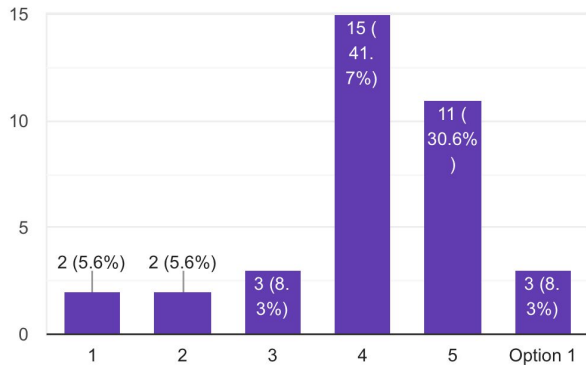
Results of survey: The solution



How effective would a detachable underdesk storage box be in safekeeping your valuables? The following is an image of the rough prototype of the given storage box



36 responses

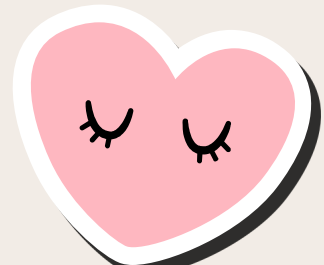


Many students emphasised that having a fixed location for safekeeping valuables would be ideal and effective to prevent theft or losing of valuables or PLDs.



How did we solve the problem?

We placed a detachable 'safebox' which can also be a briefcase/ computer carrier under the table so that it will be more convenient yet secure for the students to safekeep and take their valuables (PLDs, phone, wallet, watch).



Research findings: Similar products

A Table Product similar to our idea



Other problems that have been considered, leading us to the final product designed?



the mass of the typical PLD is about 1.4KG

- Aside from the security of safekeeping the valuables itself. Something else we observe is that students have to put the PLD in their bag and it can be heavy to carry.



Having a separate bag for it opens up a possibility or option which can be easier for the students. The briefcase is also waterproof and durable to protect their valuables, unlike the cloth computer bag given with the PLD.

Different aspects of considerations for the product

- **Accessibility**
→ Can be very accessible for students because it can be made widespread since every school uses the same table
- **Sustainability**
→ Plastic (reuseable)
- **Affordability**
→ cheap and affordable (can be made from old document boxes)
- **Scalability**
→ Able to expand the market target audience (everyone can use it not only students)



The final product

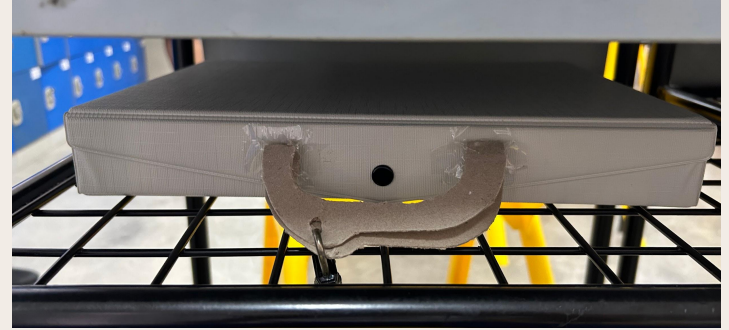


comfortable and easy to carry handle

Features of the product



Ample storage space to store PLD (as a computer briefcase) and many other valuables with its handy and not too bulky size



A padlock to lock the valuable box to the students table via the handle . The padlock is widely accessible for students due to the affordability

Functions of the different parts of the product

- Hooks under the box to clip onto the under part of the tables
- The handle has a dual function. You can lock the box to the table using the handle and it can serve as a holder.
- Large but lightweight box to hold valuables ranging from any size - wallets to laptops etc

Main Selling Points/ Appeal of product

- multi functional yet convenient
- serves as a valuable box under school tables
- a briefcase to safely and comfortably carry your laptop
- lightweight for students
- works well with the Singapore school's tables as it is standardised.
- solves issues like students losing or damaging their valuables such as laptops.
- provides space to safekeep it and can use it straight away as soon as they reach class since it is right under their table.

Future improvisations for the product

As schools get more advanced in terms of PLDs, we can expect

- Wireless charging pads as schools upgrade to wireless charged PLDS
- Other features such as sensors or thumbprint recognition, theft prevention ETC
- Have a PLD app to link to this box for locking and unlocking box, tracking location, check status of PLDs (battery percentage etc)



digital lock



wireless charging pad