



A Bittersweet Design Thinking Journey:
The Story of How An Egg Becomes A Bird

CHAN Chun Hin

Table of Contents

About the Author	3
Preface	4
Reflection on Each Lecture	6
Reflection on the Project	30
The Best Thing in This Course	40
Suggestions for the Course Instructor	41
Epilogue	42

About the Author

This short story is written by Mr. Vincent CHAN Chun Hin. He is currently a Year 3 HKUST students majoring in Computer Science. He is currently enrolling in an extended major program in artificial intelligence, with a minor in big data technology.

His hobbies are swimming, watching movies and programming. His favorite dish is Carbonara pasta.

During September 2023 to November 2023, he enrolled in a course called Cross-disciplinary Design Thinking (course code: EMIA2020), which is related to design thinking. In this course, he had a good time cooperating with his four fellow teammates and presented an excellent final prototype called “T-AI” at last, an online platform to answer undergraduate students’ questions anytime, anywhere to relieve the workloads of PGTA. Based on what he has experienced, he decided to write a short story to reflect on what he has learned, and let the readers know about how he felt after this 3-month course.



Preface

In the nature, it is very hard for an egg to grow and turn into a bird since there are many dangers everywhere that they need to overcome. Design a successful product is not an exception at all. In fact, my design thinking journey is very similar to the growing of a bird from an egg. Some experiences are bitter, like I need to do frequent interviews with some students I have never met before, or even some professors; some experiences are sweet, like the joyful procedure when I work with my teammates and build a lovely final prototype at last.

If you look carefully, an egg looks like a zero (0). Breaking the egg also means that I break many zeroes during these three months: I have the first interview with professor to capture those important small details, I have the first experience to make storyboards, I have the first experience get my hands dirty to use Figma to build a working prototype, ...

Anyway, this is one of the most valuable courses I have taken in the past 20 years of my life so far. Professor Zhang Rong has taught me a lesson about the philosophy of our society in reality: There are always some spaces for you to improve your product as it cannot satisfy the needs of some extreme users. This revokes to me the idea of nothing is perfect. However, I remember what Sun Tzu (孫子) has said in The Art of War, "If you know the enemy and you know yourself, you need not fear the result of a hundred battles." (知己知彼，百戰不殆) This is similar to what Professor Zhang Rong has quoted from Charles Kettering (the head of research of General Motors), "A Problem Well Stated is Half Solved." In my opinion, if I can capture almost all kinds of users' requirements well, plus I fully understand the available resources and the ability I can have, then the final product that I create would at least can attract most of their eyeballs. Even though it is not perfect, we can still iterate the 5 critical process again and again, until we get it good enough.

Meanwhile, I would also like to present my sincerest thanks to Professor Zhang Rong, the head teaching assistant (TA) Miss Natalie Chan, all other TAs, my fellow classmates and all the interviewees. Without them, I would not have enjoyed such a fruitful journey in these three months.

My journey has just begun, I am sure that there is still a long way for me to explore ahead in the rest of my life. Let's hope that I can have an even more exciting journey in the near future!

Written by Vincent Chan on 1 December, 2023



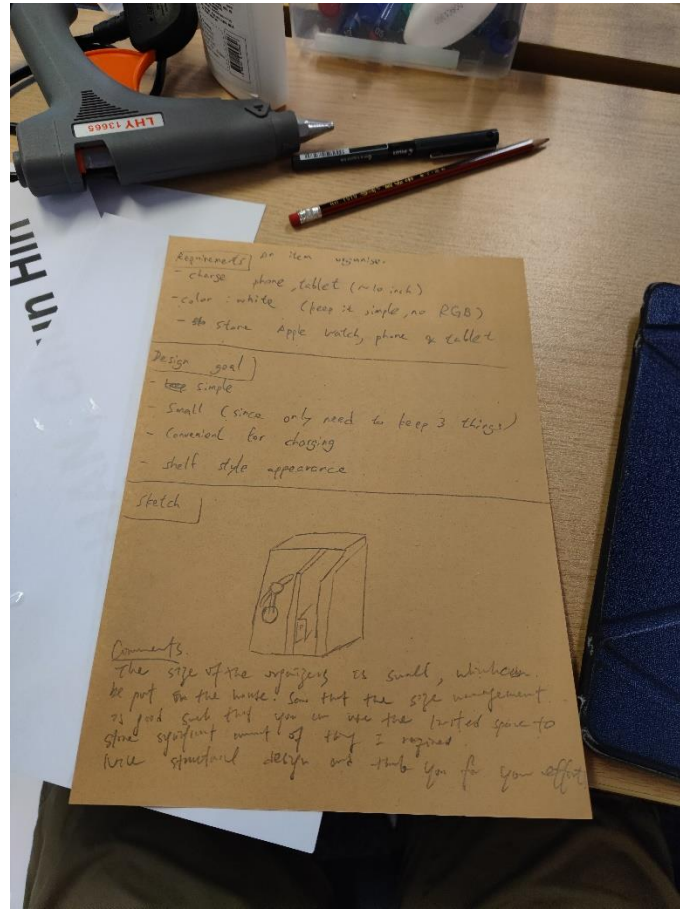
Reflection on Each Lecture

Lecture 1: Introduction

In the first lecture, I was assigned to do a mini rundown on the 5 critical processes of design thinking (i.e., Observe & interview, Focusing on the challenge, POV & Ideation, Start making it, Demo). In fact, I was paired up with a classmate I have never met before. I asked about his requirements and built a prototype in a quick and dirty manner. At last, I needed to show the ugly prototype and explain to him.

Without any experience in design thinking, this is obviously a huge failure for me: the hot glue gun and glue were not a good medium to stick the cardboards together firmly in a short time as some time was needed to allow them to condense, which made my prototype appeared as some broken parts packed together.

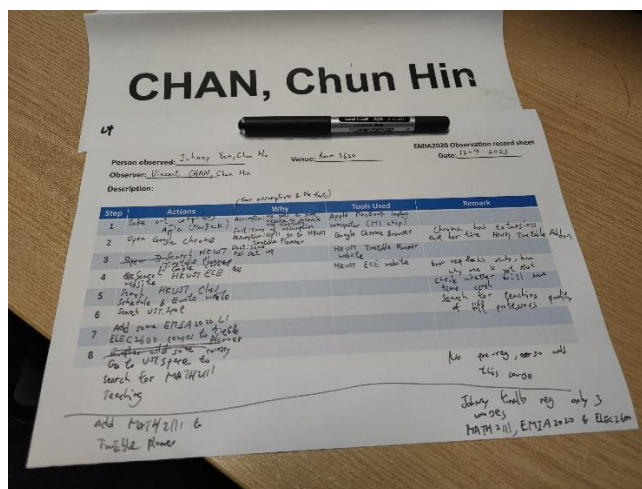
However, at the same time, this was the very first time I broke an egg: I had the very first experience in designing a prototype and show it to my client. Although eventually my prototype is a huge mess that I did not know what it is, this gave me a very brief overview of what I should be aware of when I was doing the group project in the coming 3 months. For example, it is not very hard to collect user requirements and set goals as it is relatively easy to come up with many questions. Once adequate requirements are collected, it is relatively to come up with a clear goal and sketching is an easy job since only some rough drawings are needed. In fact, the most challenging part would be the time and space provided is too limited. Based on this point, I remind myself that I should not spend too much time on collecting ingredients and try to build a scale down version of the prototype model first, so that I can have enough time to give a first overview of the prototype to my client. I also learned that these challenges would be the one I would be facing in the coming group project.



Lecture 2: Empathy

In lecture 2, I was paired with a classmate that I did not know before. I was required to observe the partner on how he built the timetable for the coming semester, and jot down every action he had done as detail as possible. I was instructed that I could not interrupt him, and the partner could not explain anything to me. After we performed the same thing by switching roles, we would need to interview each other to check whether our assumptions were correct and ask why you did such steps.

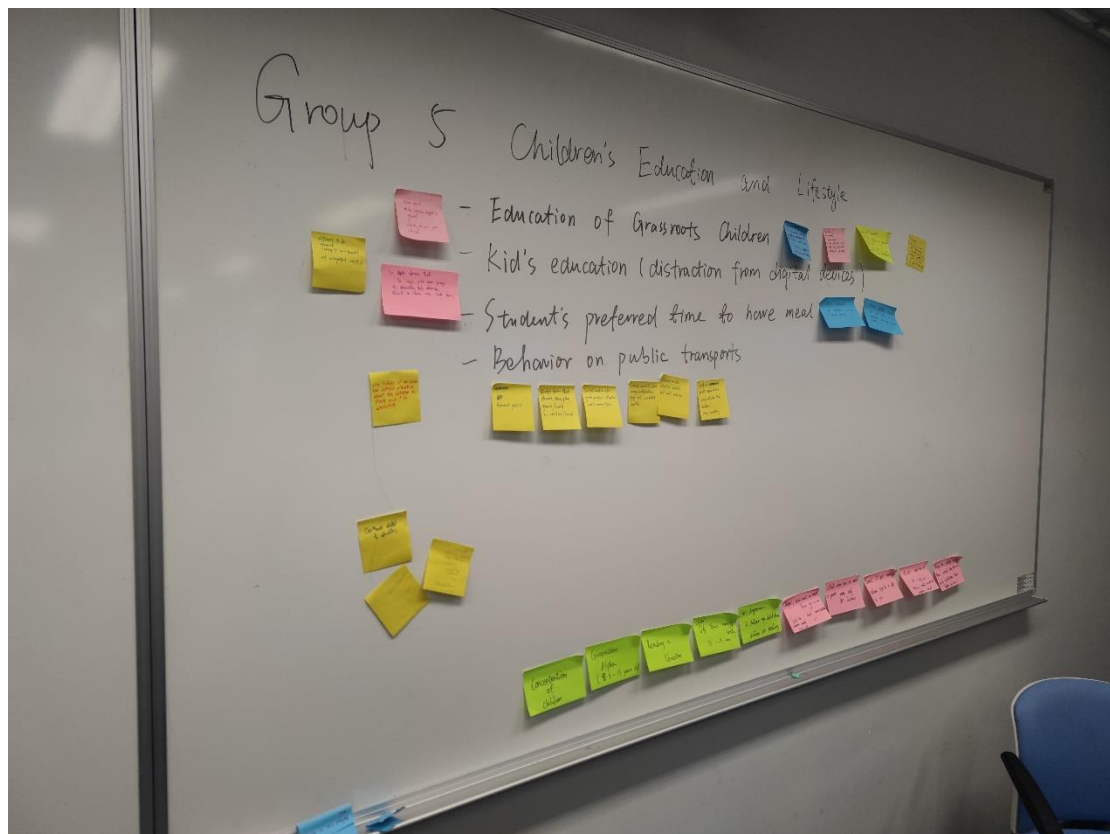
From this activity, the biggest challenge I have faced is that I need to be a good observer. I found that it was very hard to write down all the details based on what I observed. Luckily, I managed to do that when I figured out that I could use some abbreviations, symbols, and even simple drawings to achieve that. But still, the biggest failure I had is that after I interviewed with the partner, I discovered that for some of the time, my assumptions can be wrong. After some thinking, I believe this was since everyone's actions should be quite different as everyone is different when we are born. Also, during this activity, it was very surprising that I got some unexpected discovery as some of the actions done by my partner was something I did not know before, for example, my partner would search his major department website to know the prerequisites of the course he would like to take, this was something I would never do. This reminded me of a picture presented by Professor Zhang that showed the parents of the baby said loves the baby toy that hang on baby bed so much, but actually the baby only see the butt of those toy animals. This was a reminder for me that it was crucial to have different perspectives sometimes as my assumptions may not always be what I expected.



Lecture 3: Interview Sharing

In lecture 3, I gave a 90-second elevator pitch to explain all the key points for the individual presentation of our chosen topic in Assignment 1. My topic is called “Engineering Education”, so my topic is categorized to the group “University Studies”.

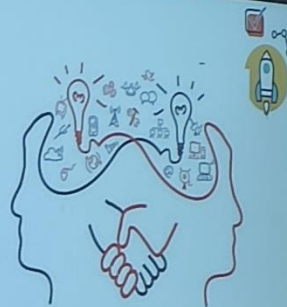
This was my first time to give an elevator pitch in front of my classmates and professor. Therefore, in my opinion, I think my presentation was not that ideal since I face quite a challenge in presenting all key points to my audience in such a short time. I did not have enough time to present all necessary things to them. But I still learn something according to the feedback from Professor Zhang and my digestion: I should be careful on not to set a topic that is too vague since my topic is a bit out of focus. For example, I should just focus on only one of the department in the School of Engineering since engineering education is too board. Moreover, it was important to skip all the details, just keep the key parts of the research is enough when I am presenting a 90-second elevator pitch.





Action Items

- **Sharing:** Go to the discussion station that interest you. Exchange your field study experience and findings. Build upon each others information.
- **Things to share:**
 - Observation findings
 - Interviewees: User/stakeholder? Regular/extreme?
 - Assumptions. Proved or rejected?
 - Pain points
 - Highlight moments from your interview. Why did these stick out to you?
 - Difficulties
- **Preparation:** Each one prepares a 90-sec presentation to share your experience/findings.
- Cover the things discussed above.
- **Presentation and Q&A for each**



➤ Use post-it to summarize your findings on the white board

➤ One key point per post-it



Lecture 4: Problem Definition

Lecture 4 is one of the important lecture in this course since defining a problem well can determine how good the final prototype/product would be. I remembered that Professor Zhang showed a quote from Albert Einstein, "If I had an hour to solve a problem, I'd spend 55 minutes thinking about the problem and five minutes thinking about solutions." This was one of the valuable quotes I have learned: Solving a problem is not hard, the hardest thing is that whether you define a problem good enough. Also, I remembered Professor Zhang gave a scenario that some villagers want a bridge. After he showed multiple slides showing some questions, such as "Why do they want a bridge?", "Why they need to transfer goods?", etc., he eventually showed that there were many kinds of bridge shown up but still, they are bridge in nature. This gave me a valuable lesson that I should always ask more "Whys", especially in the project, so that I could have more insights and more possible ways to solve the same problem. This also provided a warm reminder for me that we should avoid directly jump to the solution or otherwise we would limit the choices to solve a problem.

I also participated in two activities in this lecture. The first one was about describing the details of brushing the teeth. In this activity, the thing that impress me the most was when Professor Zhang mentioned about how what if the disabled people who lose one of the hands did the same thing, and some pictures showing automatic faucet, the flip lid instead of screw design like lid, special design toothbrush with thick handle to suit their needs. This was something I was not expected to think of and the consideration of empathy of both normal users and extreme users thus deeply printed in my mind later in doing this project. This was a great help for me to achieve a marvelous final prototype in the end of this course.

The second activity I participated was related to solving the mute and unmute problem in using Zoom during the COVID-19 pandemic. Many classmates presented many ideas and the most exciting part of this activity was that I actually presented an solution similar to what a start up company has proposed: a physical button with indicator light to indicate whether Zoom is unmute or mute. The shocking fact was that when I was known that this physical button worth millions of dollars on Indiegogo. This was surprising as I could not believe such a simple hardware can be so useful to tackle this problem. This influenced me and also my teammates to use a simple approach to solve the problem of postgraduate teaching assistants (PGTAs) not able to solve undergraduate (UG) students in a convenient way.

CHAN, Chun Hin

Problems: mute/unmute is troublesome (in Zoom)
 → students need a way to ~~avoid~~ prevent hitting the "mute" button
 because students don't want to say something secret/private to other participants
 on Zoom accidentally
 → Company staff that have children at home need a way to avoid their children
 to disturb their computer because they don't want their children open the mic
 and interrupt the meeting

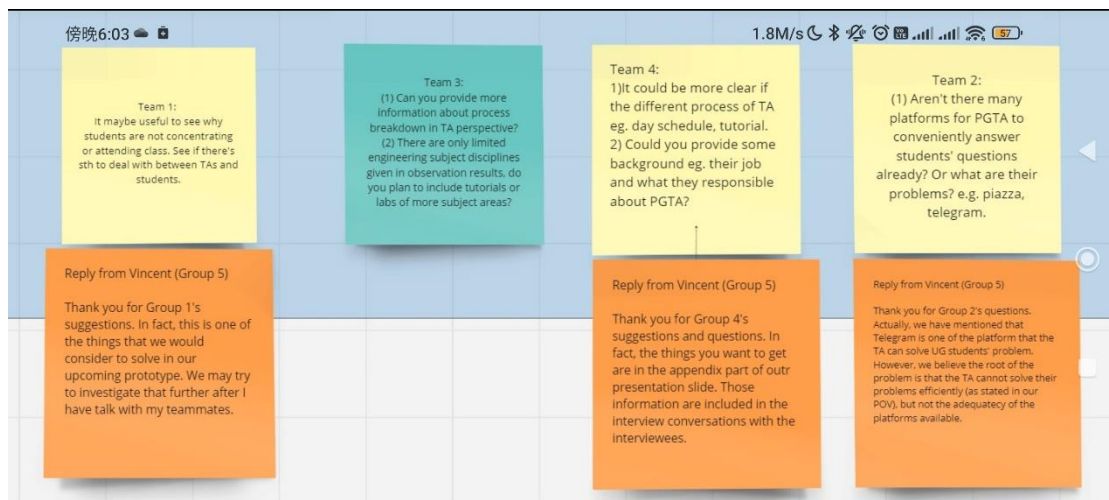
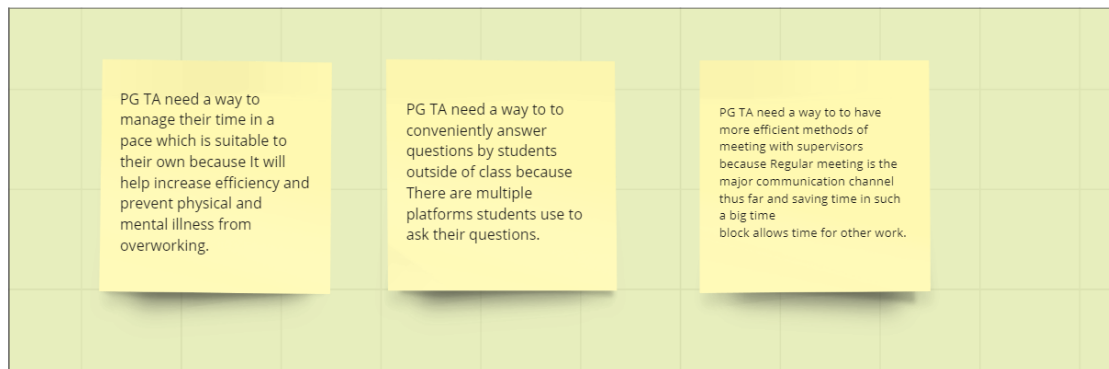
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- Prison. Brush the teeth
- ① Get my cup
 - ② Open tap water and fill the cup with water until 80% full
 - ③ Pick up the toothbrush
 - ④ Get the toothpaste and squeeze pea-size toothpaste ~~down~~ on the brush
 - ⑤ Grab the handle of the toothbrush and start to brush my teeth
 - ⑥ Start brushing ~~bottom~~ bottom row of teeth (the outward, top, the inward)
 - ⑦ Brush the upper row of teeth (the outward, top, the inward)
 - ⑧ Drink water and spit water
 - ⑨ Done (Put back)

Lecture 5: 3-Challenge Presentation

In lecture 5, my teammates and I presented our Assignment 2. This was the first time my teammates and I worked together to present our very first group assignment. We also received much useful feedback from other groups of classmates. Overall, our presentation was quite good. We asked Professor Zhang for some further advice for the Assignment 3, and he suggested us to dig more deeply in the grading done by the PGTAs. It was because the ideas of the grading we presented was of too high level, and we should talk about some details like the grading criteria for them to grade UG students' assignments.

Through this lecture, I discovered that our group was actually doing quite well according to what Professor Zhang has said. I have learned that there are many things you can learn from working with my teammates, for example, some of my teammates can fill my weakness in case I am not good at something, it is always a good thing to critically think of other groups' idea, collect and listen the feedbacks from other people always make your prototypes better and better.



Lecture 6: Divergent Thinking

Lecture 6 is one of the key lecture as the way of divergent thinking help me and my teammates to find a good approach to solved our defined POV in our project. In this lecture, we have done quite a lot of activities.

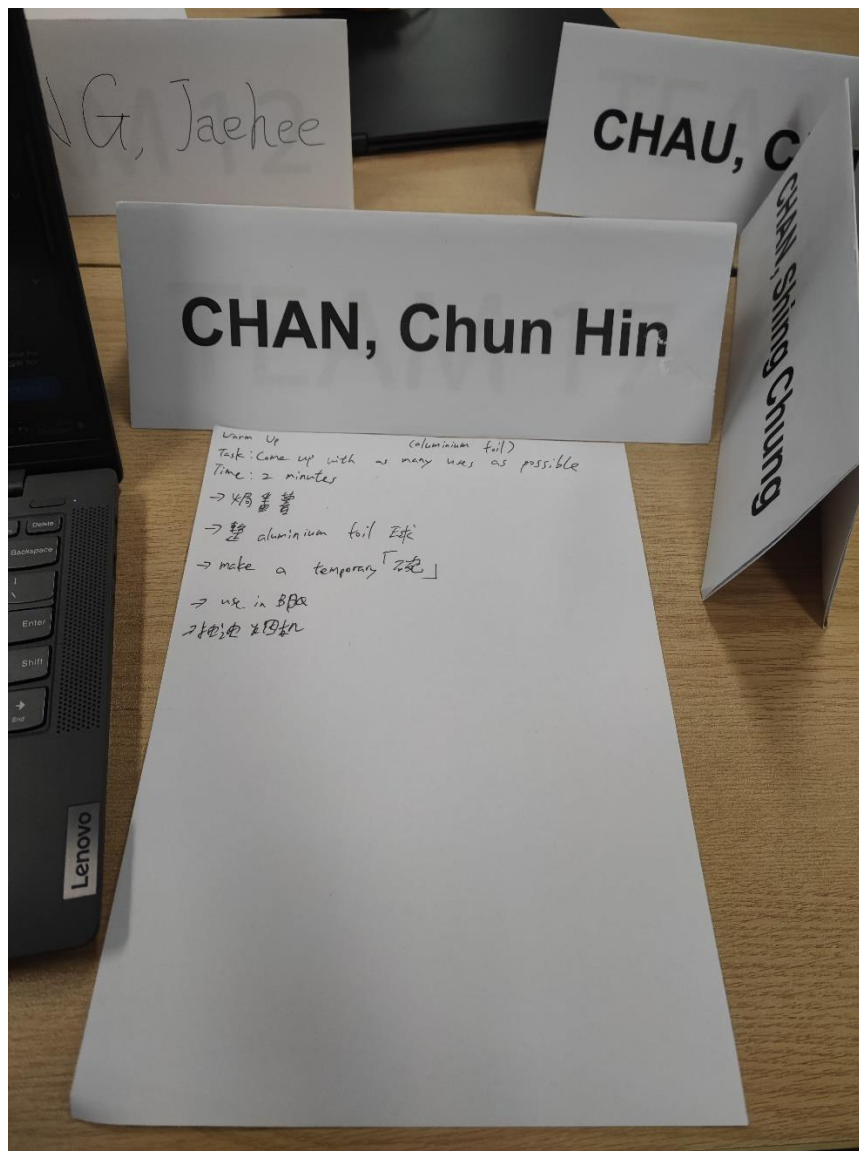
The first activity was that I needed to come up with as many possible usage of aluminum foils within two minutes. I have come up with around 5 usage, like used in BBQ, used in range hood, baked potatoes etc.. However, the valuable things I learned was that when I saw some of my classmates could come up with 10 or even 20 ideas, I noticed that it was always good to have as many wild ideas as possible when you are still searching for possible solutions. Sometimes, it may be a good idea to defer the judgement as otherwise you may overthink and reject some of the good potential wild ideas in this stage. Just like the big umbrellas located in the Great Mosque of Mecca that Professor Zhang has mentioned in this lecture to allow the people stay cool under a big hot sun, although the big umbrellas seems like a crazy idea, it turns out this idea works quite well!

The second activity was my group needed to plan an event / an activity to celebrate Amy's graduation. We were assigned to use two different mindset to approach this problem, which were "Yes, but..." (i.e., give a better suggestion) and "Yes, and..." (i.e., supplement with additional details). After this activity, we found out that "Yes, and..." seems to be the better mindset. In my opinions, I think accept ideas and build on other's idea (i.e., collaborative thinking) is a better way since "Yes, but..." mindset would easily reject other's good ideas. The "Yes, and..." mindset let me learn that I should not obsess with our first a few solutions as there are always some additional details or new things to make you first few solutions better.

The last activity was that Professor Zhang trained us to have a divergent thinking mindset using Miro. I have though of many crazy ideas and through this activity, although this made my brain exhausted, this was actually a quite fun activity since sometimes my teammates and I would come up with some interesting ideas, in which this could be useful for the next stage of finding a good solution and thus a good final prototype.

All in all, this lecture allows me to use net of opportunities to come up with as many wild ideas as possible (quantity is the key in this stage!) and reminded me not to

overthink or judge any ideas. It would also be better if we could build on other;s ideas and make something better.



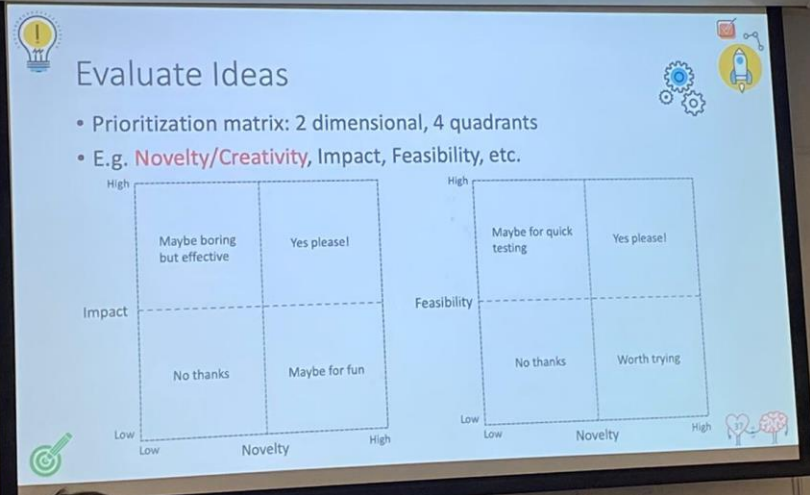
Lecture 7: Convergent Thinking

In this lecture, Professor Zhang has introduced some useful tools that would be helpful for convergent thinking, which were affinity group (which is similar to clustering) and prioritization matrix (with 2 dimensions and 4 quadrants). Then, we were given 30 minutes to use prioritization matrix to filter out the best ideas my group had come up with and voted for the best a few candidate ideas. This activity ended with a 6-minute presentation on the chosen POV, the why chain, the how chain, and three candidate ideas.

Based on this activity, I have learned that the prioritization matrix was a really good tool to visualize the quality of our group's ideas. This activity provided a good chance for me to learn how to pick the best candidate ideas for prototyping the product later in this course. With the reminder from Professor Zhang that we should be affirmative thinking, think critically and analytically to decide (sort out) some very good ideas, this further strengthens our confidence in choosing the right direction to build our prototype.

Apart from that, one interesting I had enjoyed was the clip of the movie Beijing with Love (國產凌凌漆) showed by Professor Zhang, in which the clip showed a man invented an all-in-one weapon but he eventually killed by the villain by a simple gun. This interesting movie clip also taught me not to be too greedy to cram all functionalities into only one product, otherwise this made the prototype worse instead.

Last but not least, Professor Zhang showed two promotional videos of two products (both products were related to GPS tracking), one was called LYNQ and another one was called goTele. After the careful consideration from me and my classmates, we thought LYNQ's promotional video was better. And in fact, LYNQ got more financial and investor support. Based on this, I figured out the key reason was because in LYNQ's promotional video, it demonstrated different usage environment and explicitly specify even 3 years old kid can use. This gave us a big hint that later in the promotional video of our prototype, we should consider demonstrating the use of our prototype in a few different situations.



Lecture 9: Prototype, Test & Project Management

Lecture 9 is one of the most useful lectures in this course, as well as one of my favorite lectures. Among all the things I have experienced in this lecture, here were the top three things I loved the most.

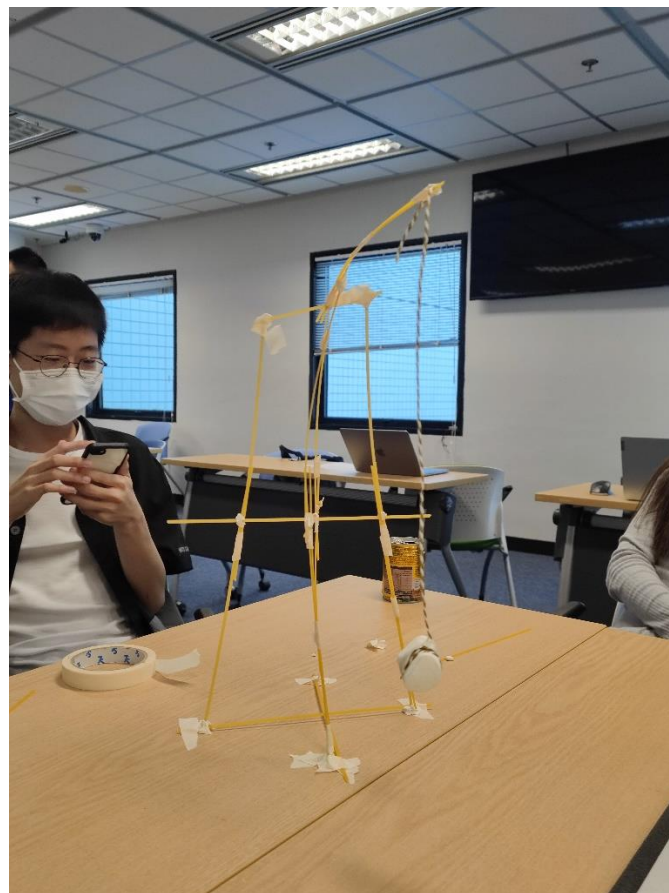
The first topmost thing I liked the most was the activity to make something in a quick and dirty manner, which was building a tower using 20 spaghetti and some tapes and blue tabs. This was another new experience I have never tried before. The mission I was required to do was to cooperate with my teammates to build a tower as tall as possible, while it can endure the weight of a marshmallow that was tied on the top of the tower. Although we did not build the tallest tower, this was indeed a golden lesson for me when Professor revealed that in reality, the engineers and the architects build the tallest tower on average, follow by the cooperation of the CEOs and the executive administrators, and then follow by kindergarten kids, while business school students being the last position. This taught me that both specialized skills and facilitation skills were the key to the success of the prototypes/products. By reflecting on this activity, I thought our group's cooperation skills were actually quite strong due to that we could always make very good quality assignments in this course, maybe the only reason we lost the first place was because nobody has a rich knowledge in civil engineering.

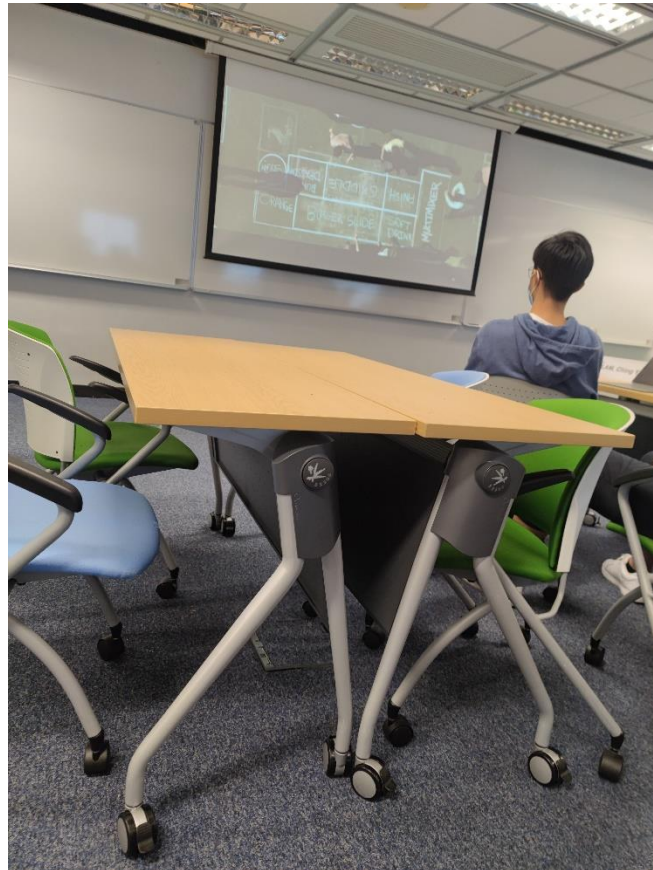
The second topmost thing I liked was the videos about how McDonald's became a fast food chain kingdom in the world. In particular, the scene that when the people iteratively repeat clean the chalk pen mark and draw new rectangles in a tennis court, and then simulate different staff standing at different rectangles to pretend they were doing their job was the most impressive one for me. I just could not believe that even such a big company just started from such an ugly prototyping in a tennis court. This again let me think of the maxim that Professor Zhang always said, "Quick and dirty."

The third topmost thing I liked the most was the storyboard. Admittedly, Professor Zhang has introduced many concepts and tools that would be helpful to boost the development of our project, like proof-of-principle prototype, prototype-user-environment interaction, Gantt charts, meeting minutes, etc., though, storyboard was one of the most supportive tools throughout the second half part of our project. I believed without storyboard, we would not have come up with such a great prototype and promotional video at last. Invented by Walt Disney in 1930s for the

production of animation and cartoons, storyboards had supported our group to visualized and predicted the user experience with our project. I would say that storyboard was a critical element in the development of our project since storyboards help us to design some possible using environments, and indirectly guide us what content should be put in the promotional video.

All in all, with all the quotes that Professor Zhang has mentioned in this lecture, I have learned that I should never afraid to the ugly and dirty prototype since this is a fundamental steps towards to success of your product. And just like what Steve Jobs has said, "Stay hungry, stay foolish." I should always remember to collect user comments after they test the ugly prototype, so that me and my teammates can find the defects in our prototype and keep improving it persistently.





Johnny's Boat Party

- Johnny has many friends. He normally organizes events to get them together. He wants to organize a boat party for 20 friends.
- Johnny doesn't know how to book a boat and what types of boats are suitable for the budget and date.
- Johnny finds this app that shows many boats options, features, prices and packages.
- He selects a few viable options and add them to favorites. He finds the app is helpful because it let him create a tentative trip and invite his friends. The friends can then vote for the options.
- After voting, his friends collectively select an option. Johnny accepts the option and confirms it. The app confirms and sends reminders to everyone.
- Johnny has to pay 50% down payment for the trip. The app helps to send reminders to friend that they owe Johnny "x" amount of money.
- One day before the trip the app automatically send a reminder to everyone with the meeting location and contact numbers.
- Johnny successfully organizes the party. His friends are happy and so thankful to him.

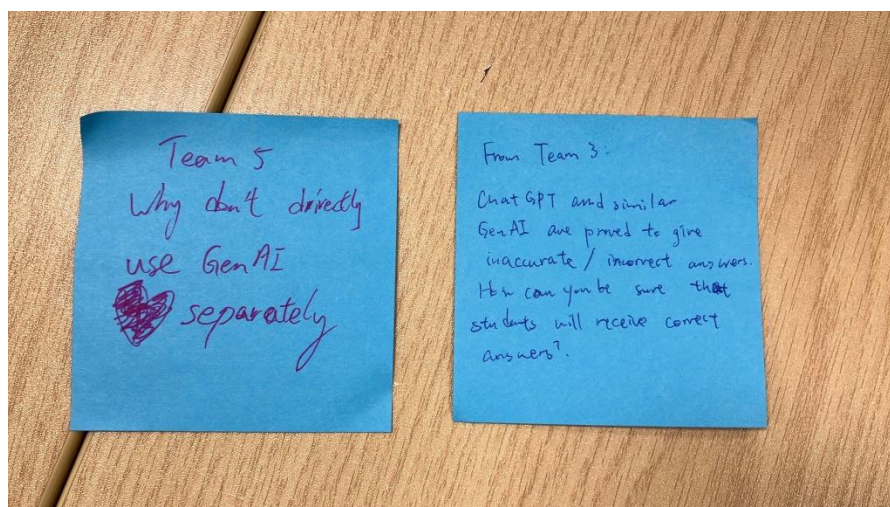
Lecture 10: Reflection on 1st Prototype

This lecture was the day my group present our very first prototype to the classmates. We were given 15 minutes to prepare, and then follow by 8 minutes of presentation. After around 2 months of hard work, it was really excited to see our prototype was finally presented to my audience, as well as other group's prototype.

To be frank, among all the other group, I liked Team 3's prototype that called SENyatta. It was because that prototype provided a very good platform for SEN students to train themselves to have better communication skills. I also loved the design of their website.

Other than that, after the presentation, we also received some advice from Professor Zhang, and the classmates. For instances, they asked why don't we use Generative AI instead, how to minimize hallucination effect. All these valuable opinions from our users provide a huge influence on how our final prototype would look like eventually. Like what the founder of LinkedIn Reid Hoffman has said, "If you are not embarrassed by the first version of your product, you've launched too late." Hence, this again told me the importance of collecting feedbacks from users and refine the prototype.

Overall speaking, this lecture gave me a sense of satisfaction that when our first prototype was done and presented it to my classmates. It was such an enjoyment to continuously working in this prototype and get useful feedbacks from my users.



Lecture 11: Storytelling & Progress Presentation

In lecture 11, Professor Zhang has played several promotional videos. The most impressive one was the video when Steve Jobs launched the first generation of iPhone. I would say that there would be a masterpiece of promoting product to the customers as I have learned the elements for a perfect product promotion. After my digestion, I came up with the following three fundamental principles.

The first principle was “no jargons! Keep it nice and clean”. It was because that I noticed that no matter the setup of the stage and presentation slides, the dressing of Steve Jobs, and even the words coming from Steve’s mouth, all things are really simple and straightforward. I discovered due to such effect, this leaves the audience automatically only concentrate on the most significant thing on the stage, the first generation of iPhone. Plus, everything Steve has said were just some plain text that everyone can understand, with the help of some visual elements, this further make the audience more clear about what was an iPhone. Such a simple present style affects our groups’ prototype to be clean as well. The user interface (UI) of our prototype was developed in a clean style that the side bars only contain a few buttons while the main part of the website just show a few available courses to choose from.

The second principle was “highlight the existing products pain points”. It was because without comparison, it would be hard for you to specify the unique features only your product can do. For example, Steve pointed out that all those phones from Motorola, Palm and Backberry had a huge physical keyboards, and then he showed that iPhone only has a home button, which allows a bigger touch screen. I believe such a big touch screen was one of the major reasons that attract many customers.

The third principle was “give some twists before you official announce the product”. This principle was actually copied from the idea of some famous horror/mysterious films like Jaws, Predator and Aliens. You should always make the customers curious before the main characters (which was iPhone in Steve’s iPhone launching event), so that we can keep the audience excited. Sometimes borrowing some elements from films can be a bonus for a better promotion of the product.

And as always, my group once again interview Professor Zhang and we collect many useful details. “The details are the demons”, through this user comments collection, our group found out something that were useful, but we have never figured out

before, such as a search bar for searching a particular topic, a mind map to summarize the content of each course, give the user an example for each question. Although some of these elements were not adopted in the final products due to the shortage of time, we still be able to improve our prototype by accepting and implementing some of the suggested functions. This taught me that I should never underestimate any details from my users.



Lecture 12: Testing in Class

This is the second last lecture before the end of this course. To be frank, this is also one of the most important lectures in this course. As mentioned in the title of the lecture, our group have allowed three other groups, Professor Zhang and the head TA Miss Natalie Chan to test our prototype. It turned out that most of them were very satisfy with the prototype. In that moment, I realized that all the important thing that we have strictly follow were right: always ask for users feedback, be quick and dirty, using storyboards, etc.. This lecture was a joyful afternoon for me when I saw my users were smiling and appreciating us after they have tested out prototype. But still, thanks to their feedback, this allow us to refine our prototype for the last time and got us prepared to shoot the promotional video.





Lecture 13: Final Demo

Time flies, here came to the final lecture of the course. This was a very big day, and also the most unexpected and touching lecture throughout these 3-month journey. Our group and other classmates played the promotional video, followed by a live demonstration of the final prototype.

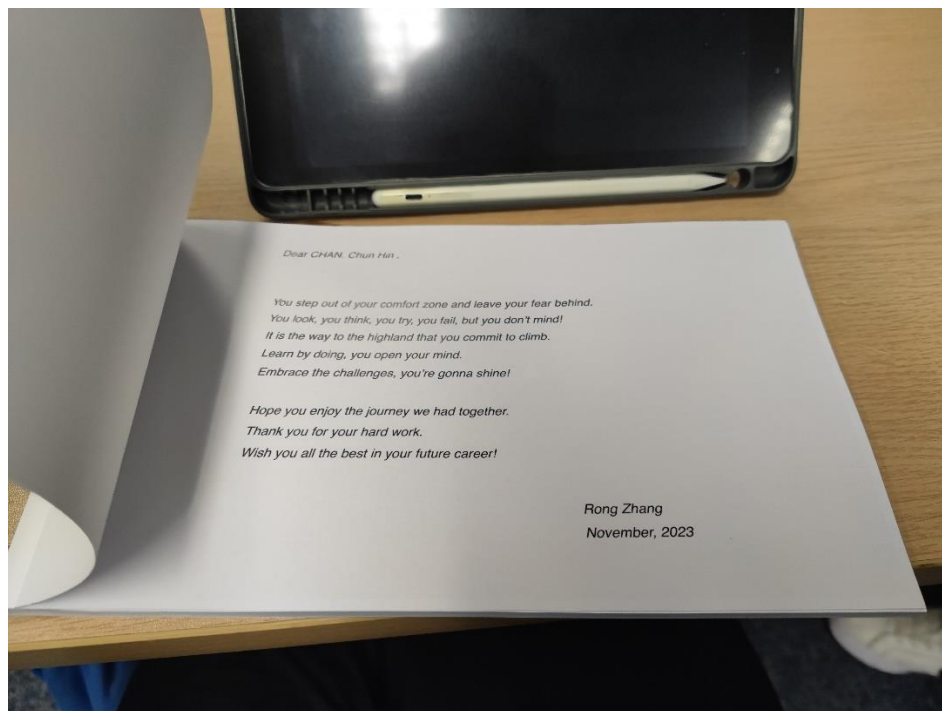
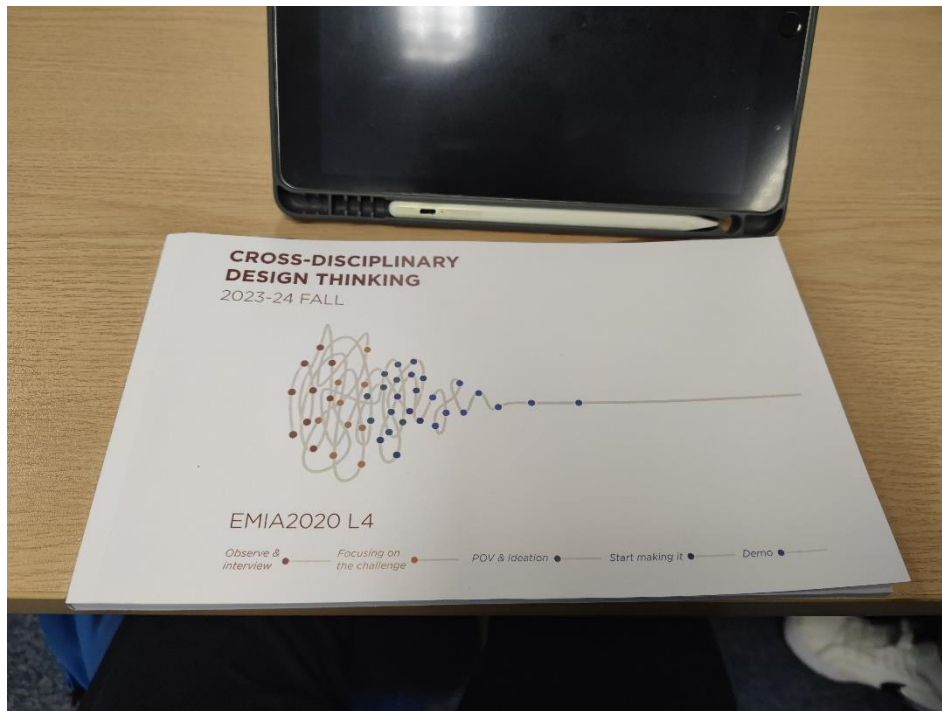
It was glad to see that after such a hard work, we could officially launch our prototype in front of my classmates, and also the professor and the TAs who were supportive throughout the semester.

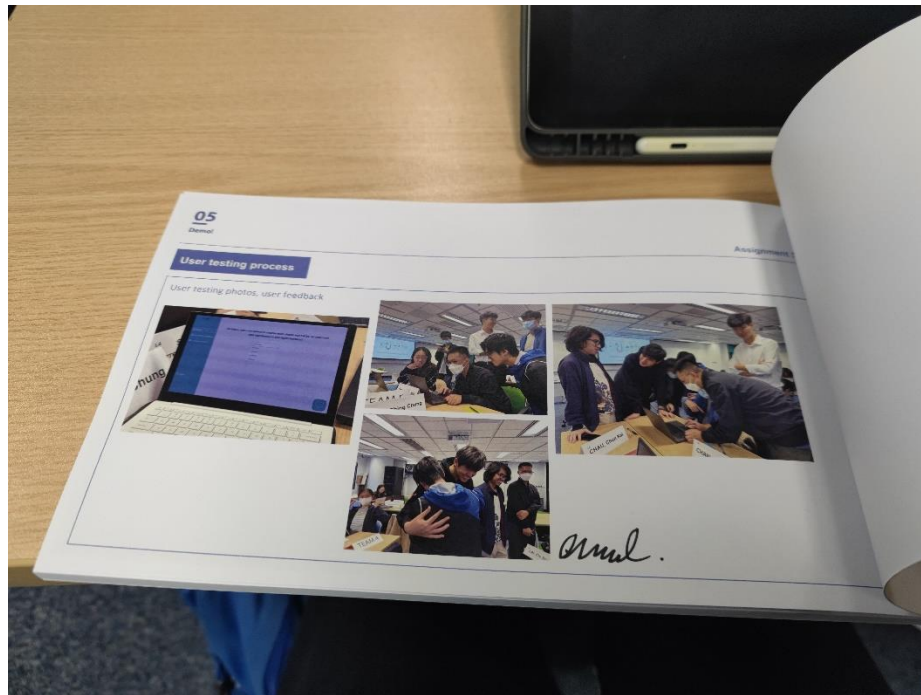
The most unexpected part would be the gifts from the teaching team, which were a song from Professor Zhang and the design book which recorded the journeys of the first 5 assignments we have done.

For the song, it was nice to see that Professor Zhang really made an assignment for himself to conclude all concepts we have learned in such an interesting way. Especially the word “POV” that emphasis frequently in the song, I would never forget that the importance of POV could directly affect the final quality of a product.

For the design book, I was very cheered to receive such a nicely designed book. Not only it summarized all the 5 important steps I have gone through in design thinking (i.e., Empathize, Define, Ideate, Prototype and Test), but it also described the growing procedure of how an egg became a beautiful bird.

The very last part I would like to mention was the photo taking of the whole class with the teaching team. It was very touching as this was the very first time I have experienced there was a photo taking event held at the end of the last lecture of a course. This became one of the pieces of my university life.





Reflection on the Project

Assignment 1: To Understand - Observe and Interview

In this assignment, I have encountered one failure and one challenge.

To begin with, since this is the very first design thinking course I have taken throughout my life, hence I encounter the very first mistake in this course, which was choosing a topic that was not focusing enough. It was because my chosen topic for this assignment was “Engineering Education”, with my target group of users were the university students studying in engineering related major. Although this was good big direction, but after I presented that to Professor Zhang, what I received was that this topic was a bit too vague due to the nature that engineering can be categorized into different disciplines, such as computer engineering, civil engineering, mechanical engineering and so on. In addition, there were too many engineering students in our university, if I do not modify the topic a bit, it would be quite hard for me to develop a prototype to suit most engineering students. Luckily, this problem was successfully solved when I paired up some good teammates. After me and the four teammates Jaga, Farrell, Jaehee and Sammul carefully consideration, we have decided combine Sammul’s research topic (Challenges faced by the teaching assistants(TAs)) and my topic, so that the new topic was “Engineering TA in HKUST”. This time, the topic was specific enough due to the fact that the number of TAs that were studying in our university was within a few hundred people, which was not too large. This helped to make a prototype that could suit more target group needs and guide us to develop an excellent prototype. This also taught me that if you choose the right working partners and bounce back to a right track, you could still perform well in the long run.

Next, here came to the challenge I had in this assignment. As mentioned before, this was the first time I interviewed some students that I did not know before, so I was actually a bit afraid to do the interview since I did not know what things could go wrong. Also, I was quite worried that if I could find suitable undergraduate engineering students to be interviewed due to the fact that most students did not like being interviewed. However, this turned out I was over worried. The interviewees Mo and Alex were easy to approach and it turned out were pretty nice to cooperate with me, for example, they would talk about many details each time I ask them a question for most of the time. Even though maybe for sometimes their

answers were not detail enough, I only needed to ask one or two questions and get all the details I need from their supplementary responses. This greatly strengthened my confidence in the coming interviews with other students and even professors in the following assignments.

The most useful thing I have learned in this assignment was the skills of interviewing other people. As this is the very first time I interviewed somebody I do not know, plus this is an individual assignment, this means that I need to handle all the things related to interviewing people. After I have searched some information related to interviews on the Internet, and also carefully examined some sample interview questions, this made me get the main idea on how to make the interview questions coherent and organized. Although I would not say that the interview questions I prepared was good, still, this gave me a valuable experience on how to obtain the information that would be helpful for my research topic from the interviewees. With the interview manner I learned based on the experience of interviewing two classmates, I am sure that this would be helpful in case I need to do more interviews in the future.



Assignment 2: Focusing on the Challenge

There were two challenges that I faced in this assignment.

The first challenge I faced was to go to several lectures from different courses to perform the observation (i.e., the field study). It was particularly hard because I was taking so many courses this semester that some of the engineering courses labs/tutorials we would like to observe has a time crash with the courses' lecture I was enrolling this semester. Since adequate observation was important to verify whether our assumption (i.e., the biggest challenge faced by the PGTA is their teaching in tutorials and lab sessions) was correct or not. Although this mission seems formidable to achieve, the benefits of having five teammates in total start to work well in such emergency situation. It was fortunate that some of my teammates, like Jaga and Farrell were willing to assist me to do observation in other courses' labs/tutorials as well, such as COMP2011 labs. This taught me the importance of helping each other in case any teammates need any help.

The second challenge I faced was the part of interviewing a professor. Before I successfully contact Professor Desmond Tsoi for the interview, I have contacted some professors from different departments from the School of Engineering. I still remembered it was quite frustrating when I received the reply emails that all the professors were too busy that they did not have a free time slot to do an interview with me. This situation got flipped when one of my teammates suggested me to interview Professor Desmond Tsoi. I invested all the hope to that and this turned out Professor Desmond Tsoi was able to pick a free time slot to accept an interview with me. This taught me a lesson that every time you feel desperate, there were still always some ways to solve the problem in some unexpected situation.

The most useful lesson I have learned in this assignment was how to synthesize the information I get from the field study observation. In the past, I usually overlook some of the details. But just like what Professor Zhang has mentioned many times, the most important things are usually hidden in those details. Thus, I try to be careful to ensure that I do not miss any details during the observation. To my surprise, what Professor Zhang mentioned was right! I remembered in one of the tutorials I have observed, the key detail I observed was that one of the classmates said that he would skip the lecture starting from next week. This detail made my group inference that it was quite common to have low engagement level from the undergraduate students. Due to that, this guide our group wondered whether TA's teaching is the

biggest challenge, and eventually the biggest challenge was not because of this reason, but the time management due to some other major reasons. This proves that be aware of those small details can be decisive to the future development of the project.



Assignment 3: Cracking Through - POV and Ideation

In Assignment 3, I faced two challenges.

The first challenge I faced was when I was developing the how chain on how the PGTAs can solve the challenge on conveniently answer the UG students' questions in an efficient manner. The hardest thing I have encountered was I realized that this could be quite hard to come up with many wild ideas since I admit that I was not a wild thinker before enrolling in this course. When I was feeling desperate that I did not get any insights, suddenly I came up with a mind: "Why don't I search on the Internet to see how other foreign universities deal with such problem?". This was how I solved this challenge because once I searched the keywords regarding this issue in my Chrome browser, so many creative and unexpected methods listed out in the search result. This taught me that sometimes I should jump out of a box. It was always good to explore a bit on the Internet as there were so many unexpected things you could find there.

The second challenges I faced was when I was unable to elaborate the third and the last candidate idea (i.e., Incorporating ChatGPT with PG TA answering) to solve our group's POV (Note: our group's POV was *PGTA in HKUST need a way to conveniently answer questions by UG Engineering students outside of class because there are multiple platforms students use to ask their questions outside tutorials.*). I was stuck because not familiar with how powerful ChatGPT can be as I did not have any experience in using any generative AI before taking this course. To make things worse, the moment that I was stuck there was only around 90 minutes before the deadline of this assignment. I even used to think that this part could not be done on time. Fortunately, I got a lot of helps from my fellow teammates. After I asked for help in our WhatsApp group, Sammul, Jaga and Farrell were here to helped me to elaborate that. They even assisted me to refine the presentation style of that part. Eventually, we successfully finished this assignment and submit it 25 minutes before the deadline. This told me that teamwork can always be the strongest support to get the mission done from impossible to possible.

The take-home message I obtained from this assignment was how to be a divergent thinker. This assignment gave me a fresh new experience on how to be a wild thinker. After this assignment, I have become more creative due to that I could jump out of the boundary I have set to myself in the past. In my opinion, the key to being a wild thinker is that you should always tell yourselves that anything that you can added to

make your ideas richer. I believe a good idea can always have many details to enrich it, such that this makes the idea great. Sometimes if you are run out of ideas, it is always good to take other teammates' ideas as a reference to see any breakthrough you can add to them since you may get some imagination from them.



Assignment 4: Start making it!

I encountered one challenge when I was doing this assignment with my teammates.

The challenge was that when me and my teammate Jaehee was trying to conduct interviews with some UG students who were taking MATH1012 in this semester, it was a bit unlucky that when we try to go to a classroom that a MATH1012 tutorial that has just ended, the tutorial has already been ended and nobody was in that classroom. This made me and Jaehee were a bit anxious since we have checked that there were no more MATH1012 lectures or tutorials until after the deadline of this assignment. After we reported such an issue to our teammates, the challenge was tackled when I saw that there was one more MATH1013 lecture in LT-D that would end in 30 minutes. Therefore, I told all my teammates to make a bet to see whether we could interview the students from MATH1013 instead.

Luckily, when we arrived LT-D, the students were still attending the lecture. We eventually successfully interviewed a few students and get enough information for filling the prioritization matrix. My teammates also accepted the arrangement suggested by me.

Through this experience, I have learned that sometimes in case some emergency situation happen, it was always good to find the availability of a backup plan so that everything can still be in progress as long as possible.

The important takeaway from this assignment is how to make some brilliant storyboards. As mentioned in the lecture, "A picture worths thousands of words", storyboards were useful in a way that it demonstrates some sample usage of the prototype in a good details. Based on the activity of drawing storyboards, the key to making good storyboards is just treating it as drawing comics in a detailed manner. If each frame of the storyboards is highly coherent to each other, the captions near each frame is simple and detailed, and the storyline is interesting enough, these three elements can produce a very informative and attractive story for your potential audience to learn about your prototype in an enjoyable manner.



Assignment 5: Time to shine!

There was one failure and one challenge when I was attempting this assignment.

The failure I encountered was that I was not familiar to develop our prototype using Figma. In particular, this problem rose when I was trying to help my group to develop the FAQ branch for PHYS1003. The reason for that was because I was initially on the track of preparing the FAQs of different courses, such as COMP1021, while other teammates focus on developing the UI of our prototype. When I finished preparing all the FAQs, I just realized how stiff the learning curve of Figma was. I have tried to explore Figma a bit, but I still failed to find a way to make the corresponding FAQ pages. Fortunately, my teammate Sammul was very kind that he was patient to teach me everything about Figma I need to know for developing our prototype. This told me the importance of teamwork makes perfect.

The challenge I encountered was that when I was shooting the promotional video, I had the difficulty on the script I should say as acting as a PGTA. Sometimes I uttered since this was my first time to be a main actor in a short video, which made me a bit nervous. Even though I did not perform well at first, but thanks to the patience of my teammates, and also thanks to their suggestions, this allowed me to become better and better in acting, and eventually perform such a natural conversions and movements in the promotional video. This once again taught me a lesson on the importance of teamwork. I have deeply understand on how good facilitation between teammates can bring a project to the finish line of success.

The most useful insight I get from this assignment is the necessary skills of how to be a good actor. Since this is the first time I became a main character in a short video, I admit that I was a bit nervous at first. But still, I managed to overcome the fear. Therefore, the most fundamental skill to be a good actor is courage. Don't mind that you cannot take a perfect shot in just one take. It is common that many trial shots are required before a masterpiece is produced, even in those famous Hollywood movies. In case you really stuck at one shooting scene, please don't afraid to ask your teammates (i.e., your filming team) to get some suggestions. This helps to speed up the filming progress a lot.



The Best Thing in This Course

The best thing that I liked the most in this course was the making of the prototype T-AI with my fellow teammates. I never thought that it would be joyful to make such a working prototype. To be frank, before I enrolled in this course, I had heard from my friends that this course was bad and making the prototype was tedious work. However, after I experienced this course, it was not that bad at all. I know that making the prototype can be somehow monotonous work some of the time, but what I gained was actually a group of nice working partners. I did not expect that working with some international students in my group (since two of my teammates were from Indonesia and South Korea respectively) was so fun! Furthermore, I really liked that Professor Zhang gave us some leniency that we were not forced to build a physical prototype using cardboard, he allowed us to submit a virtual prototype (e.g., a website, a computer program etc.). This encouraged us to have higher creativeness and flexibility to build our final prototype. But anyhow, I had a great memory with my teammates.



Suggestions for the Course Instructor

This course gave me a good impression in overall speaking. But still, here are some major points that I hope Professor Zhang can consider to make this course even better.

1. I suggest extending the duration of this course to 6 months or even 1 year. It was because that after attending this course, I found out that it would be too rush to make a good product within 3 months. Also, if the length of this course was extended, more important concepts or knowledge on how to operate a new start up business based on the prototype the students have built can also be discussed in the same course. I believe some students are interested in both designing new products and start up so that they enroll in this course.
2. I recommend modifying the structure of this course a bit by partnering with some local big companies every semester this course was offered, like PCCW, MTR and CLP. Based on the career information I obtain from these big companies, they always have some big projects that they want some university students to help with them. I believe by doing so, the student not only complete this course and grasp the fruitful career experience on working inside a company, but this also help to strengthen the relationship between our university and the companies. This also helps the students to obtain more resources when working with the companies and may even get a job offer immediately after they graduate.
3. I advise that more tutorials on how to use the prototype developing tools, especially Figma, can be delivered to the students. It is because that there are too many useful functions that students may not be able to notice when they are learning and using them to develop the prototype. Given that Figma's learning curve is a bit steep and the available time to build a prototype was less than a month, it would be better if more tutorials on how to use Figma (in a pre-recorded format) can be published on Canvas page so that students can freely watch them in case they need to use them.
4. I think more breaks can be given in each lecture. Sometimes I felt dizzy and distracted when I continuously listened to what Professor Zhang was teaching for more than 100 minutes. It is hard to concentrate if the break sessions are too short. I think 3 breaks with each break 12 minutes in length for each lesson would be more ideal.

Epilogue

Although this design thinking course has come to an end, and I need to say goodbye to my teammates, I have had the most memorable moments with my fellow teammates. I will hardly forget what I have experienced during this course. I will never forget how many “first times” I have achieved in this course since they were the evidence that proves me step out of the comfort zone.

The design thinking journey has just started, and the road is so long that I need to use the rest of my life to explore. The bird has just hatched, and the sky is huge. Let's wish that this bird can continue to grow and discover every bitter and sweet in its life.

Written by Vincent Chan on 2 December, 2023





The design thinking journey has just begun.