

**Design Thinking**

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# Introduction

The purpose of design thinking project is to apply the theory of design thinking before graduate. This design thinking project are needed in order to train the students to be able brainstorming ideas and make their idea come true. For this project, our group consist of 6 members that was Syafa, Civitya, Prema, Aqilah, Danial and Khay and the problem that we wanted to conclude for our design thinking was study method. The problem of the case was proposed by our Technology and Information System lecture, Dr Aryati. Before working on the project, we are needed to attend a talk about demo video on design thinking which was held at Dewan Seminar N28A so that we have the basic and information about the design thinking. The processes come with 5 steps which are empathize, define, ideate, prototype and test.

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| Figure 1.1 Our team |

# Details of Steps

Design thinking is where innovators with varied backgrounds and viewpoints collaborate to design something that can be useful to other people. It is a process that starts with interviewing and asking people about their problems and end up with putting everyone’s innovative new solution out in the world. There are three phases in Human-centered design. The first phase is the inspiration phase where you learn something from the problems of the each people you design for. You’ll learn directly and also immerse yourself in their lives and deeply understand their needs. From what you learned on the second phase, ideation phase, you will make sense of it and identify opportunities for design, also to prototype possible solutions. And on the last phase, which is the implementation phase, you will finally create something and bring your solution to life. To specify the phases in design thinking (human-centered design), there are 5 processes. Empathize, Define, Ideate, Prototype, and Test.

Empathy is the foundation of a human-centered design process. To empathize, we start with observation. This is where we view the users and their behavior to understand what they really need in their lives. After we observed, then we do interaction and interview people through both scheduled and short ‘intercept’ encounters. This is called engaging. Engaging with people can reveals a tremendous amount about the way they think and values they hold directly. The purpose of engaging is to uncover the needs that people may or may not be aware of. And the last is to immerse. You must experience what your user experiences to deeply understand what they need. While empathizing, refer people to Empathy Map handout. This is useful when thinking about how the user reacts with your ideas, and to see if they may or may not fit into your new ideas. On the empathize mode, we listed down all the questions and asked some students of Universiti Teknologi Malaysia about their problems and how can we fix their problems.

Next, the define mode. This is where we gathered and wrote down all the problems from the user that we have interviewed. From every different problem, we wrote down the main points. In this mode, we are to focus on the problems. Defining the problems will make us easier to ideate, which is the third mode, and to find the solution to the problems. Different from defining, to ideate is to explore a wide solution space. It can be anything to solve the problems. The designer must think widely and to have an open mind in solving problems. In the ideate mode, we did brain storming and came up with many ideas but then we chose one solution, that was to make an app called “DisMath”.

After that, we created the prototype. Prototype mode is the next process where we create an example of our idea in a physical form. The resolution of the prototype should be commensurate with the progress in your project. And prototype is useful when people can experience with it so that they can see how their problems will be solved. In the prototype mode, we created an example of our app from pieces of papers that we modified and we formed it into pages. These pages were obviously the pages on the app, like the main menu, the formula page, the tips and tricks page, and others.

Finally, the last process is the test mode. This is where the created prototype is being use by the user. The user can interact with the example that can solve their problems. When prototype is to know what you design is right, the test mode is to prove if what you design might be wrong, or can’t solve the user’s problems. We showed this prototype to some of the Faculty of Computing students. We explained how to use the app and how this app can help us in studying problems then we let them try and interact with our app in hope that this app will be useful and helpful.

# Design thinking evidence

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| Figure 3.1 The sample work |

Many people have a different problem in their case of study. For example:

When they are in the classroom, some of them are felt sleepy or bored during the lesson. Because of the lesson is not interesting or maybe they did not understand with the lecture. Another problem is they are could not concentrate in the classroom. So, they hard to remember the formula or the point out of the information from questions and they might not have enough time for learn materials. Some of them are confused to choose which formula they can use and also they cannot imagine the formula, for example when they get a probability questions, they have to understand with the question so they can imagine which formula they can use.

## Empathy

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| Figure 3.2 The respondents |

Our group interviewed 3 people. They are first year and taking Graphics and Multimedia software course in UTM. Their name are Fikri Ismail, Syukran and Haries. We ask them about the problem they got in studying process. Both Fikri and Haries have problem regarding pointing out the information from the question and visualize it while Syukran are having problem on memorizing the formula because there are many formula for each chapter in Discrete Structure subject. Thus, we will create the ideas to solve the problems that faced by our respondents.

## Define

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| Figure 3.3 List of problems    Figure 3.4 List of solutions |

Our group arrange and define the problem, then we discuss the solution by giving each of our opinion. After that we choose the best solution we get and wrote it in a paper.

List of the problems is

* + - 1. Cannot imagine non diagram questions
      2. Hard to remember the formula
      3. Hard to point out the information from questions
      4. Cannot concentrate in class
      5. Not enough learning materials
      6. Not understand the lecture
      7. Get bored during the class.

List of idea

1. Develop an apps
2. Develop education games
3. Make a question bank with answers
4. List of formula in mind map
5. Make solution in interactive way such as animation/visual
6. Timetable Simulator
7. Augmented Reality Lecture
8. Virtual Reality Lecture
9. Tips and tricks for students

## Ideate process

After we collect some problems that people have, we found some solution to solve their problems. We make an application that called “DisMath”. “DisMath” is an application which is focus on Discrete Structure Subject within provides some of questions that used to exercise for the users. The questions have levels, from the easiest to the hardest and also for each question have a solution with an interesting way using animation to account the probability questions. So, the users will not get bored. Another questions and solutions, this application also provides tips and tricks for study. The users can type their problems in the search bar and the app will give many sorts of solutions. There are also many menus to choose. These menus are linked to many kinds of articles and sources such as YouTube for *motivational video*, blogs for *dos and don’ts*, *tips and tricks in studying*, *best brain food*, etc. If the user felt tired, they can open the tips and tricks. It also provides the formula to make the user easy to remember. The formula is compiled by different chapter. So, the user easy to find the formula which is they need.

Finalize Solution: Create an app

Apps name: Dismath

Main Concern: Help Student in Discrete Structure Subject

Special Features: 1- Provide Solution in visual

2- List of formula in mind map

3- Give tips and tricks to the students

## Prototype

In this prototype, we plan to provide a tool that user need. The tools that provides in this prototype are;

Question. In this tool, users can exercise from the easiest question to the hardest question.

Formula. This app provide summary of the formula to make it easy for user to memorize and help them to use it to solve the question. For example summary formula of probability’s discrete structure subject.

Tips and tricks : to increase our learning and studying process, this tool give tips and tricks which contains motivation video, motivation quote, time management, best food for brain, and do’s and don’ts.

d) We create the prototype using colored paper and use our creativity to make it similar like the real app.

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| C:\Users\liyana\AppData\Local\Microsoft\Windows\INetCache\Content.Word\IMG-20181202-WA0026.jpg  Figure 3.5 Making prototype |

## Test

Lastly, we test the prototype to the user by picking a random student in the faculty. The user are allowed to use the prototype and then we run and process it like an app. First, we explain about the function of our prototype and the problem that we can solve using our prototype. Then the user will try the prototype and give the feedback. During the testing they give us the positive feedback for our ideas and it ensure us that our design thinking project was successful.

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| C:\Users\liyana\AppData\Local\Microsoft\Windows\INetCache\Content.Word\IMG-20181202-WA0018.jpg  Figure 3.6 Testing with user |

# Reflection

After done our design thinking project, we knew that how the important process of design thinking in our studies. Besides, we need the knowledge to be apply soon after we graduated because most field of work will needed the design process. We must have understand well in order to achieve our target on creating the ideas. Teamwork is important to make the work perfect. The project need all of us to give our commitment on each other task.

What we do as a team working are, first we interviewed some students around the faculty of computing. We ask about their problem during the lecture class. After we did some interview, we make a list of their problems and also we wrote our own problems during the class. After that, we collect all the problems and we choose to focus in one subject to make a prototype easily based on the problems. Then, all of us give our opinion to solve the problem and choose the best solution. After we found the best solution, we created the prototype models. And finally we test our prototype to the user. Thus, we found that it is important that we need to be able to work as a team to train us before applying jobs after we graduate because we will be given a limited time to solve a problem and in order to achieve the goals each member must play their part well.