POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

ADVANCED SAFETY HELMET

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(08DKA20F1044)

A report is submitted to Civil Engineering Department as a partial fulfilment of the requirement of the Diploma in Civil Engineering

CIVIL ENGINEERING DEPARTMENT

SESSION I :2022/2023

DECLARATION OF ORIGINAL AND OWNERSHIP

TITLE: ADVANCED SAFETY HELMET

SESSION I : 2022/2023

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1. We are students of the final year of Diploma in Civil Engineering, Civil Engineering Department of Polytechnic Sultan Salahuddin Abdul Aziz Shah.

2. We acknowledge that the project and the intellectual property contained there in are the work of our original work without taking or imitating any intellectual property from any other party.

3. We agree to transfer ownership of the intellectual property of the project to Polytechnic Sultan Salahuddin Abdul Aziz Shah to meet the requirements for the award of Diploma in Civil Engineering to us.

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ACKNOWLEDGMENT

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ABSTRACT

A helmet is a type of safety helmet used by motorcycle users. Wearing the right helmet can reduce the risk of head injury by up to 70% and reduce the risk of death by up to 40%. For this reason we want to create an "advance safety helmet" which is able to solve problems such as incorrect helmet use among motorcyclists. The objective of this project is to improve the helmet strap such as the addition of a buzzer, and a sensor so that it can give reminders to the user to wear the helmet with the strap properly. However, the main factor of students not wearing helmet straps properly is students tend to forget to wear the helmet. Based on the interview conducted, the percentage rate obtained from students who tend to forget to wear the helmet is 54.20%, which is higher than the percentage rate of them being lazy to wear it, which is 42.40%. In addition, the interview process was conducted among students of the Civil Engineering Department to get the level of practicality and comfort of the user when using the helmet in terms of the effectiveness of warning the wearer. The average from the students answered in survey with a mean score of 3.17. This means that the helmet is able to give a warning to the wearer without affecting their level of comfort. Therefore, with improvements to this project, the level of correct helmet use among students who ride motorcycles can be increased and accidents caused by incorrect helmet use can be reduced.

ABSTRAK

Topi keledar adalah sejenis topi keselamatan yang digunakan oleh pengguna motosikal. Pemakaian topi keledar yang betul boleh mengurangkan risiko kecederaan kepala sehingga 70% dan mengurangkan risiko kematian sehingga 40%. Oleh sebab itu kami ingin mencipta satu “advance safety helmet” yang mana ianya mampu menyelesaikan masalah seperti pemakaian topi keledar yang tidak betul dalam kalangan penungang motosikal. Objektif bagi projek ini adalah bertujuan untuk membuat penambahanbaikkan pada tali topi keledar seperti penambahan buzzer, dan sensor supaya dapat memberikan peringatan kepada pengguna untuk memakai topi keledar bersama tali dengan betul. Walau bagaimanapun, faktor utama pelajar tidak memakai tali topi keledar dengan betul adalah disebabkan terlupa kerana berdasarkan proses temu buat yang dijalankan kadar peratusan yang diperolehi untuk pelajar terlupa memakainya adalah 54.20% lebih tinggi berbanding kadar peratusan mereka malas memakainya iaitu 42.40%. Selain itu, untuk tahap kepraktisan dan keselesaan pengguna semasa menggunakan topi keledar dari segi keberkesanan memberi amaran kepada pemakai. Proses temu bual telah dijalankan kepada pelajar Jabatan Kejuruteraan Awam PSA purata daripada kalangan pelajar menjawab setuju dengan skor min adalah 3.17. Ini bermaksud topi keledar tersebut mampu memberi peringatakan kepada pemakai tanpa menjejaskan tahap keselesaan mereka. Oleh itu, dengan penambahbaikkan pada projek ini dapat meningkat tahap pemakaian topi keledar yang betul dalam kalangan pelajar yang menunggang motosikal serta dapat mengurangkan kemalangan yang berpunca dari pemakaian topi keledar yang tidak betul.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Each country has haven own set of safety standards. In Malaysia, the safety standards of each helmet must have the approval and certification of the Standards and Industrial Research Institute of Malaysia (SIRIM) to ensure that helmet meets the safety standards that have been set. The specifications used by SIRIM are MS 1-1: 2011 Protective Helmets and Visors for Vehicle Users. This standard is new one replacing the old standards basically has the same purpose, which is to ensure that the helmet used id safety.

Next, wearing a helmet while riding a motorcycle is mandatory for motorcyclists in Malaysia. A law mandated the wearing of helmets was enacted in the early 70s. Although, legal action has been taken but there are still riders who do not wear them to cause serious accidents. Therefore, the idea to innovate the existing helmet by adding sensors to the strap to reduce the risk of serious accidents.

This project is also one of the recommendations from previous studies where it recommended to make a helmet that has a warning system that able to increase users to always wear the helmet correctly. Next, adapt and apply a seat belt reminder system into motorcycle as helmet reminder system. (Basil David Daniel et al, 2015)

1.2 RESEARCH BACKGROUND

Despite the helmet is the best protective equipment to prevent or reduce severity of head injuries, majority motorcycle user did not use or fasten it properly. There are several studies in developing countries found that the percentage of proper usage of helmet amongst motorcycle users is consider low. A study in Malaysia 54.4% were used their helmets have created for motorcyclists to reduce serious injuries caused by improper use of helmets, and even some suggestions have been put forward.

1.3 RESEARCH PROBLEM

This study was proposed due to riders not being concerned with wearing a helmet. As a result, many serious accidents occur especially head injuries. From the previous research many parents send their children to school without wearing a helmet, and even their children do not wear the device, (Mohd Sofi, 2018).

Next, is that many motorcyclists do not wear helmet straps properly. From the previous research, motorcyclists make up the largest group of fatalities on Malaysian roads, the majority succumbing to head injuries despite compulsory safety helmet laws in the country. One possible reason for this high fatality rate is improper usage of helmets, (S Kulanthayan, 2000).

Lastly, looked down on the wearing of a helmet or unhelmet. From previous research, a conditional logistic regression analysis showed that compared with helmeted motorcyclists, non- helmeted motorcyclists were more than four times as likely to have head injuries, Wen-Yu-Yu et.al (2011).

1.4 RESEACH OBJECTIVE

Therefore, this study is to design advance safety helmet with the sensor on strap of existing helmet for riders. The objective of the project are:

i. To design the advanced safety helmet for motorcycle riders.
ii. To identify the factors that cause users not to attach a strap when wearing a helmet.
iii. To ensure the level of practicality and comfort of the user when using the helmet.

1.5 SCOPE OF PROJECT

The scope is only focused on motorcyclists did not wear helmet properly among of student Diploma in Civil Engineering of Polytechnic Sultan Salahuddin Abdul Aziz Shah. This study is to design “advanced safety helmet” for motorcycle riders. To validate the project, a questionnaire will be done by motorcyclist among student PSA.

1.6 SIGNIFICANT OF PROJECT

This study is to design an “advanced safety helmet” usage among motorcyclists. In the future works, Theory Planned Behaviour (TPB), Health Belief Model (HBM) and Technology Acceptance Model (TAM) will be used in understanding and identify the influencing factor in predicting proper usage of helmet. Besides the suggestion is possibility to adapt and apply a seat belt reminder system inti motorcycle as helmet reminder system, Ambak et.al, 2009. Hopefully, this research may contribute a significant finding and method that be able to mitigate current problem in the country regarding motorcycle safety program.

1.7 CONCLUSION

In conclusion, a helmet is an essential item to motorcycle riders. Disciplinary action can be taken against motorcyclists do not comply with the rules for wearing a helmet. Therefore, we will design an advanced safety helmet which can help motorcyclists to always wear the helmet properly and safely. This also can help motorcyclists to always abide by the rules of road. Because of that, it can reduce the risks of serious injuries in the event of a road accident.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter is a summary of previous research are related to this project which is advanced safety helmet. This literature review is reviews from google scholarly, articles, books, and other resources relevant to a specific area of this project. The survey that has been done can summarize and evaluate the suggestion from the previous research to explain this research. The content is including specific information reviews and all the data from different authors will be collected and analysed as guidance to generate and idea to solve the problem issue in this project.

In this chapter, we will perform the research about the previous study that used the same concept as our project. Advanced safety helmet is the innovation from the existing helmet where the addition of buzzers and sensors on the helmet strap is made to increase the level of helmet wearing correctly among students. In addition, previous studies have said that concepts such as the use of seat belts on cars are used for the use of motorcycle helmets. Finally this concept is can reducing the risk of head injury and serious accidents.

2.2 LITERATURE RIVIEW

According to Wenyu Yu et.al (2011), In this study on effectiveness of different types of motorcycle helmets and effects of their improper use on head injuries, a conditional logistic regression analysis showed that compared with motorcyclists with firmly fastened helmets, those with loosely fastened helmets increased their risk of head injury (OR 1.94; 95% CI 1.33–2.82) and were more than twice as likely to have brain injuries (OR 2.50; 95% CI 1.47–4.25). Furthermore, wearing a loosely fastened helmet may compromise any potential protection. Hence, "advanced safety helmets" are design to reduce the risk of serious injury among motorcyclists with the help of additional features on the helmet straps to warn of wearing the helmet properly.

According to Kamaruddin Ambak et.al (2010), this study is Malaysian Motorcyclists Concern to Safety Helmet Usage. The observations of 1150 motorcyclists show that only 46.6% used helmets properly, 10.6% untied helmet and 42.8% without-helmet. A random of 300 respondents those improper wearing helmets (either untied helmet or unhelmeted) were interviewed and asked to fill-up a questionnaire.

According to The Road Transport Department Malaysia, 2020. Any helmet that complies with UNECE R22 certification (with E marking) or MS1 (SIRIM logo) is eligible for use on the road. For a list of UNECE R22 approved helmets entering the country. It is automatically eligible for use on the road. Hence, this statement has described the specifications that need to be adhered to for each helmet that can be used and approved can support the objectives of this project.

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According to Mark Pickhard, 2014. Reed switches offer a much lower power consumption than any other competing technology could deliver, saving significant cost by reducing battery size requirements. In power-sensitive applications, reed switches are the best solution for maximizing power efficiency. Therefore, in this project a magnetic sensor was selected as a material that can warn the wearer and can also increase the level of wearing of this helmet among motorcyclists.

According to Ashraf F Henfy et.al, (2012). This study aimed to evaluate the effect of helmet wearing on motorcycle riders' death rates on a global level. Helmet non-usage percentage was the most significant factor affecting motorcyclists' death rate. Wearing a motorcycle helmet can reduces the risk of death from a motorcycle.

2.3 CONCLUSION

This study attempts to assist the reader in comprehending the numerous aspects raised by research on the necessity of motorcyclists wearing a helmet properly. This is significant because many individuals take this for granted, yet motorcycle riders who wear helmets that are too loose increase their risk of head and brain damage.

CHAPTER 3

METHODOLOGY OF THE PROJECT

3.1 INTRODUCTION

Studying methodology is a necessary step in creating a project. To develop a high-quality project or result, process planning must be carefully examined. The method in which each step or technique must be completed before a product is complete is shown here. To achieve better and guaranteed results, work techniques must be carried out in a systematic and proper manner. All work and tasks that need to be completed can be followed and carried out in a safe and orderly manner with the use of an organised work approach. The work steps that will be used to finish this project will be covered in this chapter. The project methodology consists of project planning, project sampling, project processes, data collection procedures, and data analysis procedures. Diagrams that can aid in understanding the process of producing this project will be included with descriptions of each step of the work to be done.

For this study, researchers will be using flowcharts to explain the process of methodology. In this chapter, the advanced safety helmet will be shown and the developing of the project is explained using figures for the reader to clearly understand on how advanced safety helmet is developed. Furthermore, tables will be used to explain the methods of collecting data so that the readers completely understand how data collection is collected for this project.

3.2 FLOWCHART FOR METHODOLOGY

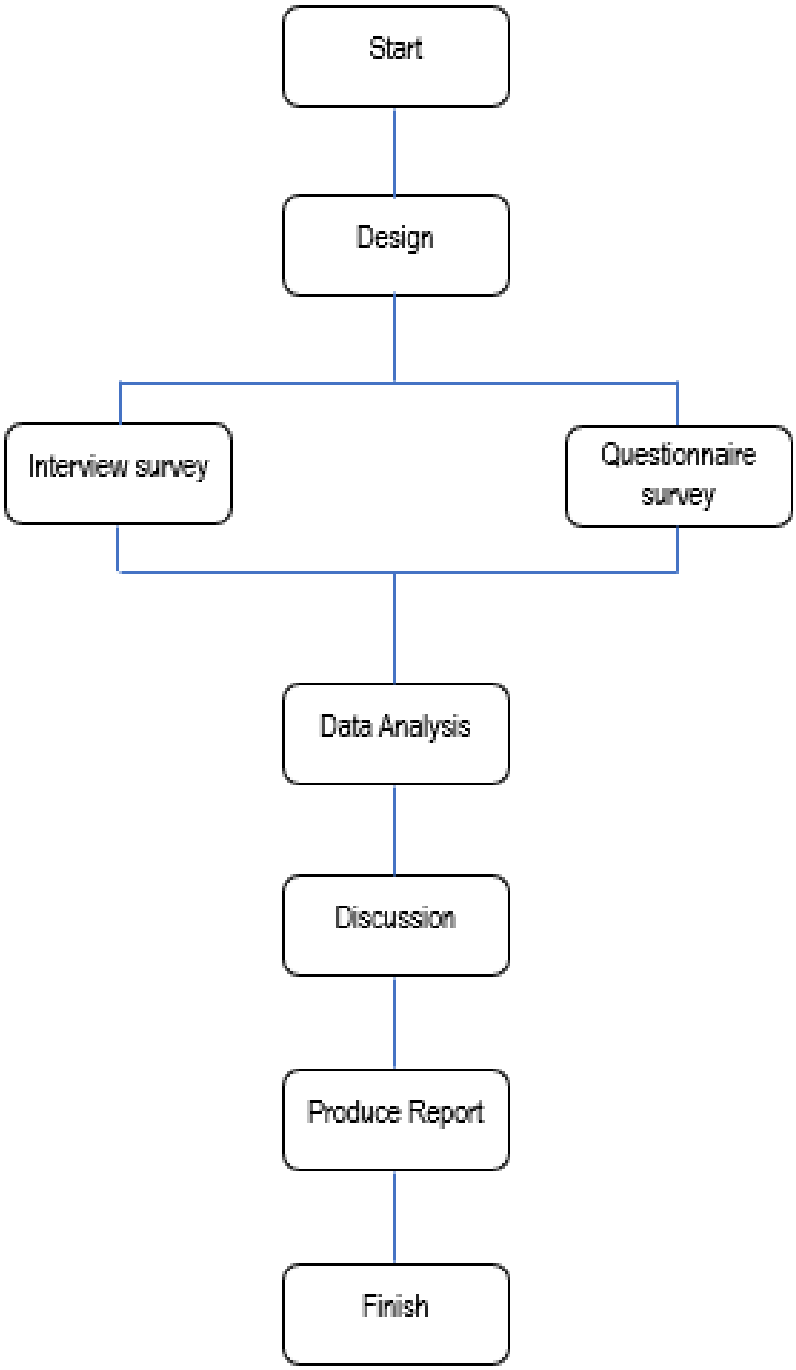


Figure 3.1 The Flowchart for Methodology

3.3 PROJECT DESIGN

Designing a project is the process of creating a new product or altering an existing one to make it better. The study's design is also intended to assist in resolving a few customer issues. The challenges can be resolved using these product design principles, which are helpful. An early draught of the project is seen in the drawing below

3.4 METHODS/ PROCEDURE/ TECHNIQUES OF PROJECT

Methods, procedures, and techniques used in project production include work activities that encompass processes such as project cost, duration, and scope of work. The project scope and the product scope make up the work scope.

- Product scope: the desired design's quality, features, and functions.
- Project scope: team member coordination and time, resource, information, and space management.

The deadline is the time frame given for finishing a project. Projects that are finished within the allotted time show that the project management is excellent and effective. Project Cost, which is the sum of money set aside to carry out the project. Materials purchases and project management expenditures are a few of the associated charges.

3.4.1 METARIALS AND EQUIPMENT

MATERIAL	FUNCTION
1. Helmet 	The role of the helmet is to protect the safety of the human head, avoid or reduce the impact of falling objects in high places and the impact of other objects. Therefore, safety helmets are very important for our safety.
2. Magnetic Sensor 	A magnetic sensor is a sensor that detects the magnitude of magnetism and geomagnetism generated by a magnet or current.
3. Google form 	Google Forms is one of the applications included with Google Drive. Google Forms is a virtual form that allows us to obtain certain information collected from respondents that we have set.
4. Battery 	A battery is an electrical power source consisting of one or more electrochemical cells with external connections to power an electrical device.
5. Buzzer 	To produce a high-pitched or humming sound when power is applied to it. That is why it is very suitable to integrate with Arduino, because when an event is produced that you want to warn or alert, you can program the microcontroller to send a signal to the bell if the event occurs and thus warn you with that sound.

3.4.2 DATA ANALYSIS METHOD

Data collection is the process of collecting, quantifying, and evaluating informative results for study following defined, recognised techniques. A researcher may assess their hypothesis considering the information gathered. Regardless of the topic under investigation, gathering data is typically the first and most important step in the research process. Different methods of data collecting are employed in various fields of study depending on the information required. According to Tony Johnstone Young (2015), surveys and questionnaires can be excellent resources for gathering data for needed research and evaluation. How to design and create a survey or questionnaire that serves its objective effectively is the difficult part.

3.4.2.1 INTERVIEW SURVEY

Interviewing involves asking questions and getting answers from participants in a study. Interviewing has a variety of forms including individual, face-to-face interviews and face-to-face group interviewing. The asking and answering of questions can be mediated by the telephone or other electronic devices.

According to the author (Syed Muhammad Sajjad Kabir, 2016) Interviews can be three sections of interview depending on the formality and structure. The sections are:

A. Structured,

B. Semi-structure or

C. Unstructured.

This study considered the semi-structure interview to be most suitable, as set of the questions and respondents need to solve.

3.4.2.2 QUESTIONNAIRE SURVEY

A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. The purpose of this questionnaire is to be analysed and used as information to achieve the objectives of study which is to ensure the level of practicality and comfort of the user when using helmet.

To implement this project, questionnaires will be given to the students of Civil Engineering Department. The questionnaires have eight questions in total (Appendix A). The first and second question represent the age and gender of respondents. Next, from the question three to six it seeks information about the practicality and comfort of user when using the helmet. The purpose questionnaires are to get feedback from the respondent about the practicality and comfort of user when using the helmet.

Throughout this paper, the Likert scale terms are used to describe the survey data as collected and after the scaling method is applied. According to Matteo Lionello, Francesco Aletto, et.al,2021, Likert scale is composed of ordered categories ranging from “strongly disagree” to “strongly agree” (or vice versa). Each point in the scale represents the degree to which the respondent agrees or disagrees
regarding a specific statement or construct, which is then typically associated with a value.

Table 3: Mean Score for Likert Scale

Respondent	Point	Mean Score	Explanation
Strongly Agree	4	3.51-4.00	Very High
Agree	3	2.51-3.50	High
Disagree	2	1.51-2.50	Moderate
Strongly Disagree	1	1.00-1.50	Poor

3.5 CONCLUSION

A lot of data can be collected on the "Advanced Safety Helmet" after doing research on the survey method. For the design concept and dimensions that will be used in the project's production, this information serves as a reference. The design process can be made simpler by using this information as a guideline. Systematic observation sampling method and this questionnaire form is used to obtain the necessary data from the students. This data was obtained and analysed using frequency analysis and mean scores in the form of Microsoft Office Excel software users.

CHAPTER 4

DATA ANALYSIS

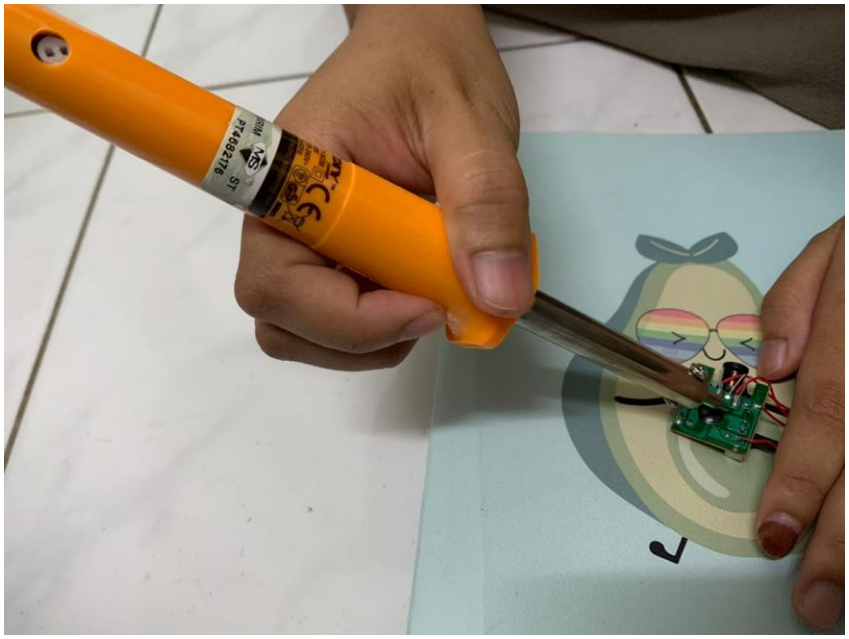
4.1 INTRODUCTION

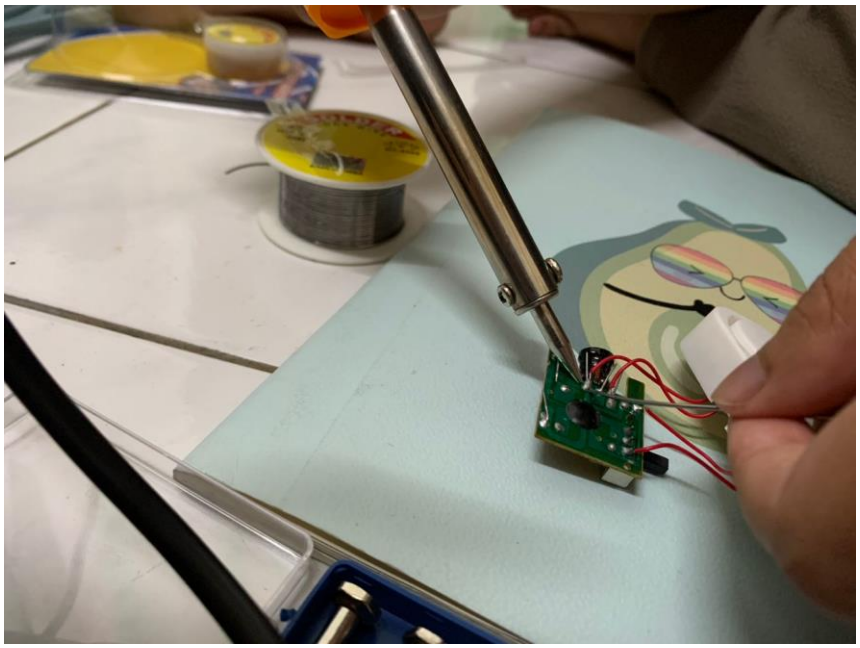
This chapter summarises the research's conclusions, which were drawn from test results and questionnaire responses. Results from this chapter were gathered via questionnaires given to students in the Department of Civil Engineering (JKA) at Sultan Salahuddin Abdul Aziz Shah Polytechnic who were engaged in the motorcycle accident (PSA). Analysis is carried out to determine the effectiveness of the study once all the data and information have been collected. Once all the data and information are obtained, analysis is done to see the effectiveness of the study.

The analysis was started by testing the frequency and percentage. The results of the study in this chapter are used to get conclusions about the functional of the advanced safety helmet as a reminder to motorcyclist in addition to achieving the objective of the study is to identify the factors that cause users not to attach a strap when wearing a helmet. Therefore, this chapter will describe the findings of the questionnaire and interview conducted.

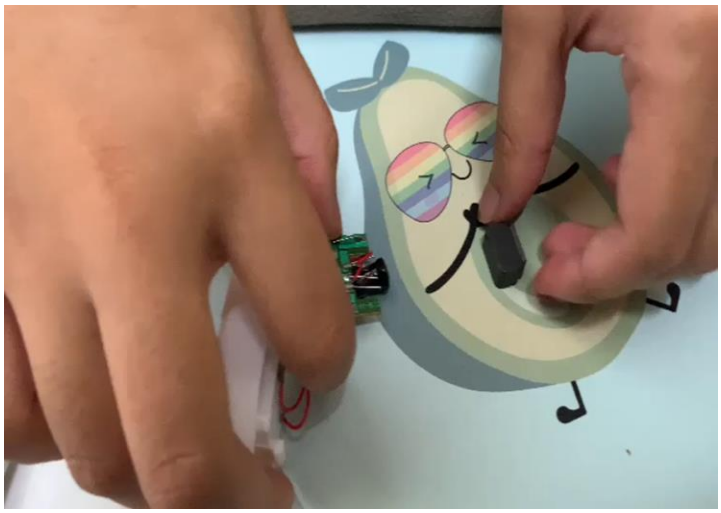
4.2 DEVOLOPING ADVANCED SAFETY HELMET

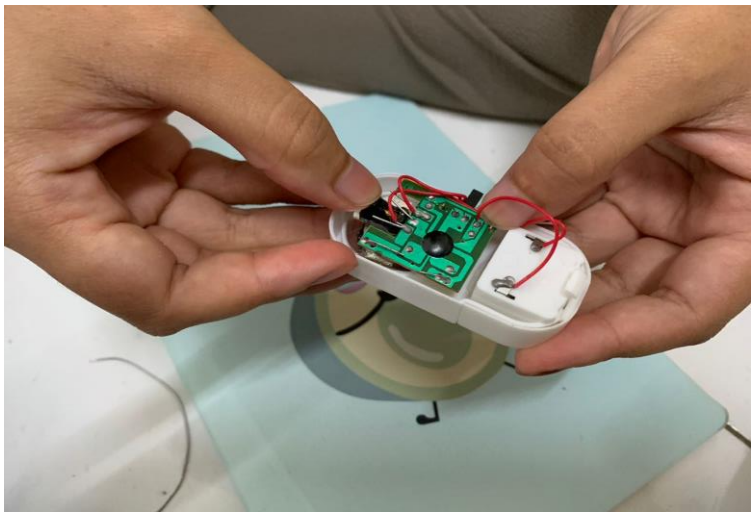
Step 1:





Step 2:





Step 3:

Step 4:

4.3 RESULT OF SURVEY TO IDENTIFY THE FACTOR THAT CAUSE USER NOT TO ATTACH A STRAP WHEN WEARING A HELMET

4.3.1 RESPONDENT DEMOGRAPHSHICS

Table 4.1 profile of respondents

	Background	Respondents	Percentage
Gender:			
	Male	50	84.70%
	Female	9	15.30%
Age:			
	15 - 17	0	0%
	18- 20	55	93.20%
	21 above	4	6..80%

This section presented summary contents respondent background base on gender and category. The result will be discussed in term of percentage, as shown. In total there were 59 respondents. Male has a total of 50 respondents accounting for 84.70 % while the female has a total of 9 respondents accounting for 15.30 %.

There were only two categories of age in this survey. The categories were known are the range of age between 18 to 20 and 21 above. From the data the range of age between 18 to 20 has a total 55 of respondents accounting for 93.20 %. While the range of age 21 and above had a total of 4 respondents amounting to 6.80 % of respondents.

4.3.2 Identify factor that causes user not attach a strap when using a helmet.

This objective shows and present the findings of a study conducted to identify factor that causes user not attach a strap when using a helmet terms of the effectiveness of warning the wearer. Data analysis is the process of collecting and organising data to compile good conclusion.

Table 4.2 Identify factor that cause user not attach a strap when using a helmet.

Statement	Frequency	Percentage (%)
Types of motorcycle licence		
Full Licence	55	93.2
Probation Licence (P)	3	5.1
Learning Licence (L)	1	1.7
Riding a motorcycle in a week		
6-10 times	7	11.9
10-20 times	38	64.4
20 times and above	14	23.7
Towards road accident		
Yes	50	84.70
No	9	15.30
Experiencing road accident		
1 times	49	83.06
2 times and more	1	1.69
No more	9	15.25
Types of helmets possessed		
Full Face	47	79.7
Half Shell	11	18.60
Flip up	1	1.70
Helmet Size		
S	0	0
M	59	100
L	0	0
Factor not using a helmet strap		
Forgot	32	54.20
Lazy	25	42.40
Want to be quick	2	3.40
Wear a helmet even the destination is nearby		
Yes	8	13.80
Sometimes	47	81.0
No	3	5.20

According to An Bras Dermatol, 2014, the sample size for an expected prevalence of 10% is the same as that for an expected prevalence of 90%. In this study the population of Department Civil Engineering in PSA is 369 students. Hance, the sample size of 59 samples is sufficient for this study. The researcher distributed copies of the questionnaire to all students Diploma Civil Engineering PSA. This data was obtained and analysed using frequency analysis and mean scores in the form of Microsoft Office Excel software in 2019.

Form the tables 4.2, it could be seen that the highest percentage are 93.2% of respondent types of motorcycle license is fully license, and the balance holding probation license 5.1% and learning license 1.7%. The most of riders are riding a motorcycle are 10-20 times in a week and the percentage was 64.4%.

In addition, from the interviews conducted, the total percentage of riders who have been involved in this motorcycle accident is 84.70%, which is a total of 50 respondents. Only 15.30% have never been involved in a road accident. Next, the study found out of 50 respondents who had been involved in this road accident. most of them were only involved once with a percentage of 83.06% in the accident.

Besides, based on the highest percentage of 79.70% of respondents wearing a full-face helmet, as you already know that a full face helmet is the safest helmet to use with the Sirim logo on the helmet. In addition, all respondents wear M-sized helmets because this is the standard size used by most helmet users.

Finally, among the factors with the highest percentage that cause users not to wear helmet straps is that users forget to attach helmet straps with a percentage rate of 54.20%. Next, users who are lazy and want to go to a destination as soon as possible are the reasons why users do not wear helmet straps with a percentage rate of 42.20% and 3.40%.

4.4 SURVEY OF LEVEL PRACTICALITY

Table 4.3 level of practicality of user when using helmet

Statement	Mean score
This 'advanced safety helmet' helps warn the wearer to wear it correctly	3.39
This 'advanced safety helmet' can ensure users wear helmet straps	3.30
Helmets cause neck pain	3.07
Wearing a helmet causes limitations in neck movement	3.03
Wearing a helmet is inconvenient	3.06
Average Mean Score	***3.17***

Table 4.3 shows the mean score of each question and the level practicality of user when using the helmet from poor to very high. The average mean score was 3.17 indicating they have a high level of practicality of user when using helmet. As indicated in table 4.3, the first question is this advanced safety helmet helps warn the wearer to wear it correctly. It got the highest mean score of 3.39.

As mentioned in Question 2, this advanced safety helmet can ensure users to wear the helmet straps because the mean score was 3.30. This means that helmets can help students use helmets correctly to avoid any serious injuries in the event of an accident.

From question 3, the mean score that has been obtained is 3.07, this means the finding that wearing a helmet can cause pain in the user's neck. Next, in question 4 we ask whether wearing a helmet causes limitations in neck movement and the average answer we get is yes because the mean score for this question is 3.03.

Finally, our question is wearing a helmet is a troublesome matter and the answer we get from our respondents is agree because the mean score was 3.06. However, this matter should not be taken lightly because this is a law that has been set by the authorities to ensure that road safety can be improved and one of the ways to reduce road accidents.

CONCLUSION

Questionnaire research is very important in the success of a project and to find out whether the objectives of the project are achieved or not through the feedback of the respondents. Based on the feedback received through this questionnaire, it can be concluded that the main factor for students not wearing helmet straps is forgetting. Therefore, with the presence of a sensor installed on this advanced safety helmet, it can help the respondent to wear the helmet strap.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

This chapter concludes the result and finding about “advanced safety helmet”. The researcher has conducted an extensive and comprehensive study to develop an advanced safety helmet, to identify in terms of factor that and to ensure the level of practicality and comfort of the user when using the helmet. We have also developed advanced safety helmet using the existing helmet to improve the functionality of wearing helmet with reminder. Lastly, recommends future research that can enhances the methodology introduced in this research.

5.2 CONCLUSION

Advanced safety helmets are innovations from existing helmets with the addition of buzzers and sensors to these helmets to provide a warning or sound effect to the wearer in addition to solving the issue of wearing a helmet that is not worn with the strap properly. After all, this helmet is also effective without interfering with the level of practicality and comfort for the wearer. It can be concluded that the main factor for students not wearing helmet straps is forgetting. therefore, with the presence of a sensor installed on this advanced safety helmet, it can help the respondent to wear the helmet strap.

5.3 RECOMMENDATION

The result from the finding showed that advanced safety helmet is functional and useful. The objectives of this project were achieved as this advanced safety help to ensure the level of practicality and comfort when using the helmet in terms of reminder. Moreover, this advanced safety helmet has get the good respond from the respondent.

At the end of this study, the recommendation for this project are as shown as below:

i. Shrink the sensor used to make it look more perfect.
ii. Replace the use of batteries in the sensor with solar use so that there is no problem of running out of batteries and the sensor not working.

5.4 SUMMARY

Based on all the studies carried out on this project, this project can increase the level of helmet use among diploma students in the Civil Engineering Department of the Sultan Salahuddin Abdul Aziz shah polytechnic in addition to solving the problems raised in this project. Hopefully this study can fulfil the recommendations from previous studies from Ambak et.al, 2009, Besides the suggestion is possibility to adapt and apply a seat belt reminder system inti motorcycle as helmet reminder system.

REFFERENCES

Ashraf F Henfy et.al, (2012).

Does wearing helmets reduce motorcycle-related death? A global evaluation. Retrieved from https://www.researchgate.net/publication/232085944_Does_wearing_helmets_reduce_motorcycle-related_death_A_global_evaluation 9 May 2022.

Basil David Daniel et al, 2015.

Behavioral Intention to Use Safety Helmet Reminder System Using the Extended Technology Acceptance Model. Retrieved from https://www.academia.edu/36355885/Behavioral_Intention_to_Use_Safety_Helmet_Reminder_System_Using_the_Extended_Technology_Acceptance_Model 28 May 2022.

Kulanthayan Subramaniam, 2000.

Compliance of proper safety helmet usage in motorcyclists. The Medical journal of Malaysia 55(2):40-4.

Mark Pickhard. (2014).

Reed Switch Technology for Low-Power Metering Applications, 28 May 2022

Retrieved from https://www.fierceelectronics.com/person/mark-pickhard

Wen-Yu Yu et.al. (2011).

International Journal of Epidemiology, Volume 40, Issue 3, June 2011. Pages 794–803.

https://www.researchgate.net/publication/316228107_Questionnaires_and_Surveys

https://researchconnections.org/research-tools/data-collection/survey-research-and-questionnaires

Syed Muhammad Sajjad Kabir (2016).

Method of data collection, In book: Basic Guidelines for Research: An Introductory Approach for All Disciplines (pp.201-275) Edition: First Chapter: 9

Wenhu Tang; Tianyao Ji; Huiling Zhu; Ye Ouyang; Wenbo Wang (2020)

Detection of Safety Helmet Wearing Based on Improved Faster R-CNN

https://ieeexplore.ieee.org/abstract/document/9207574

Dr. Saul McLeod, updated 2019,

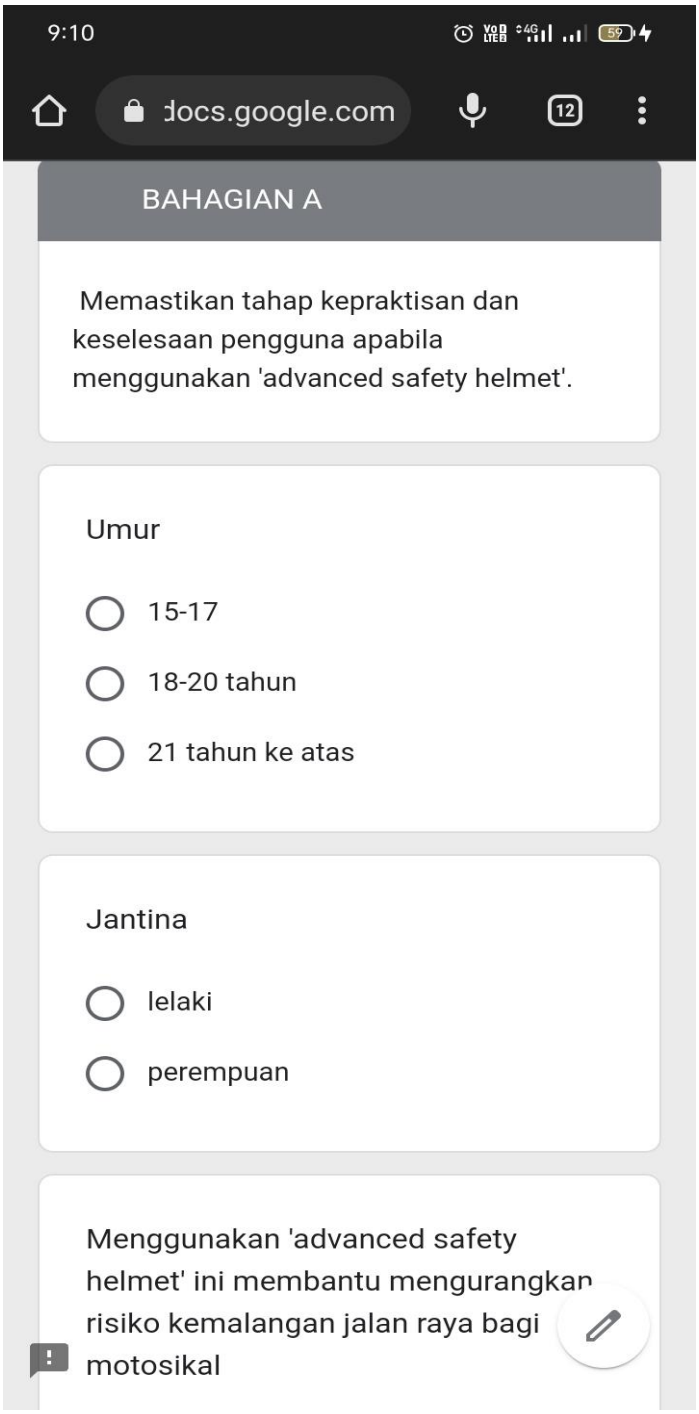
Likert Scale Definition, Examples and Analysis,

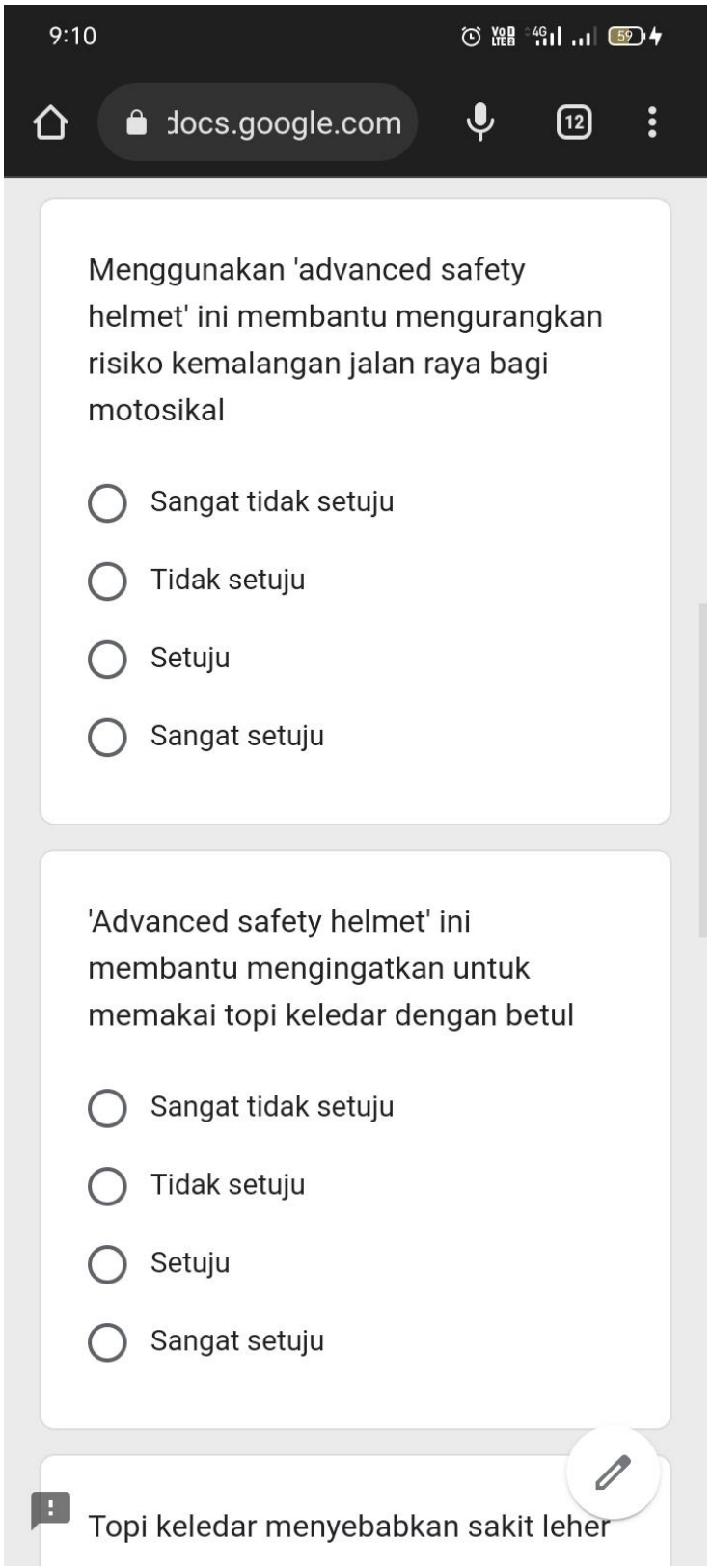
https://www.simplypsychology.org/likert-scale.html

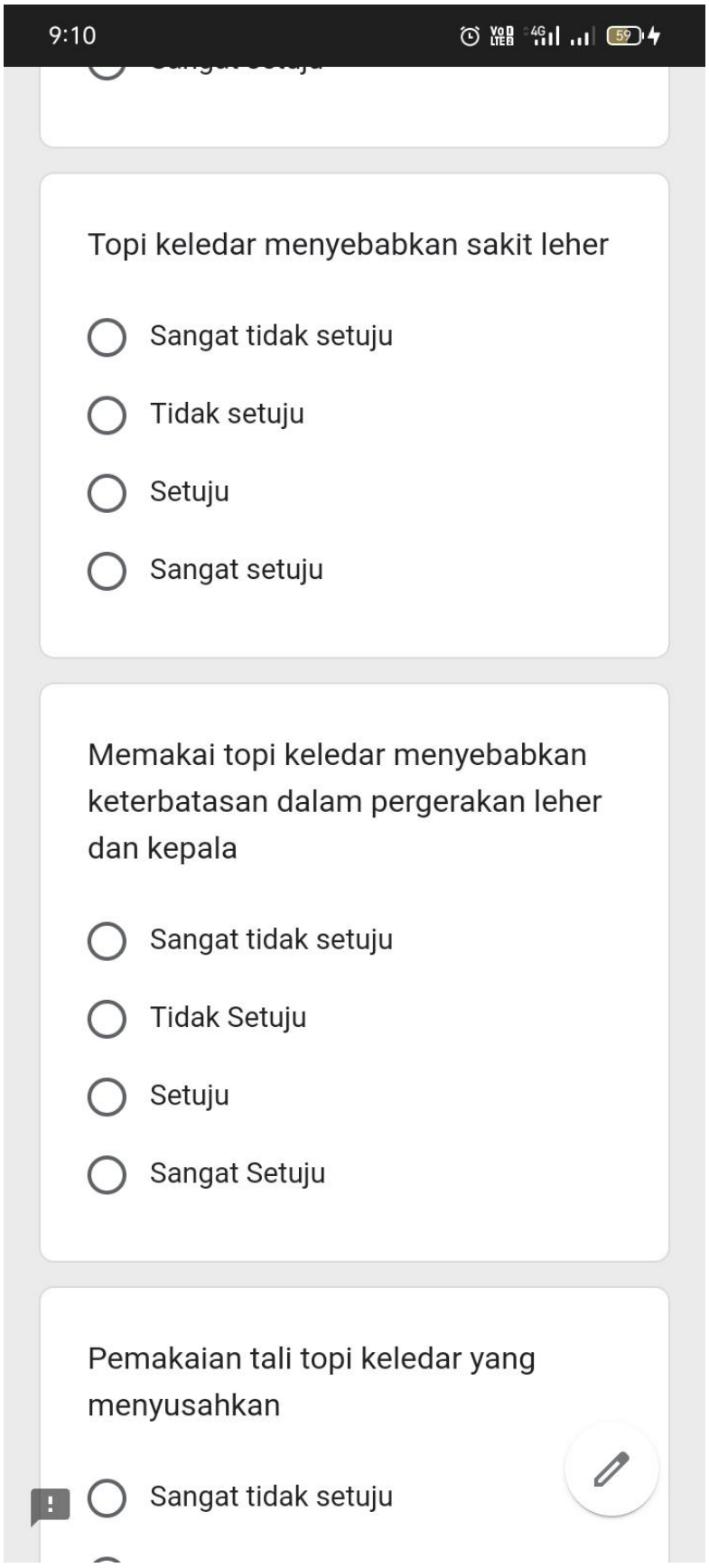
APPENDIX

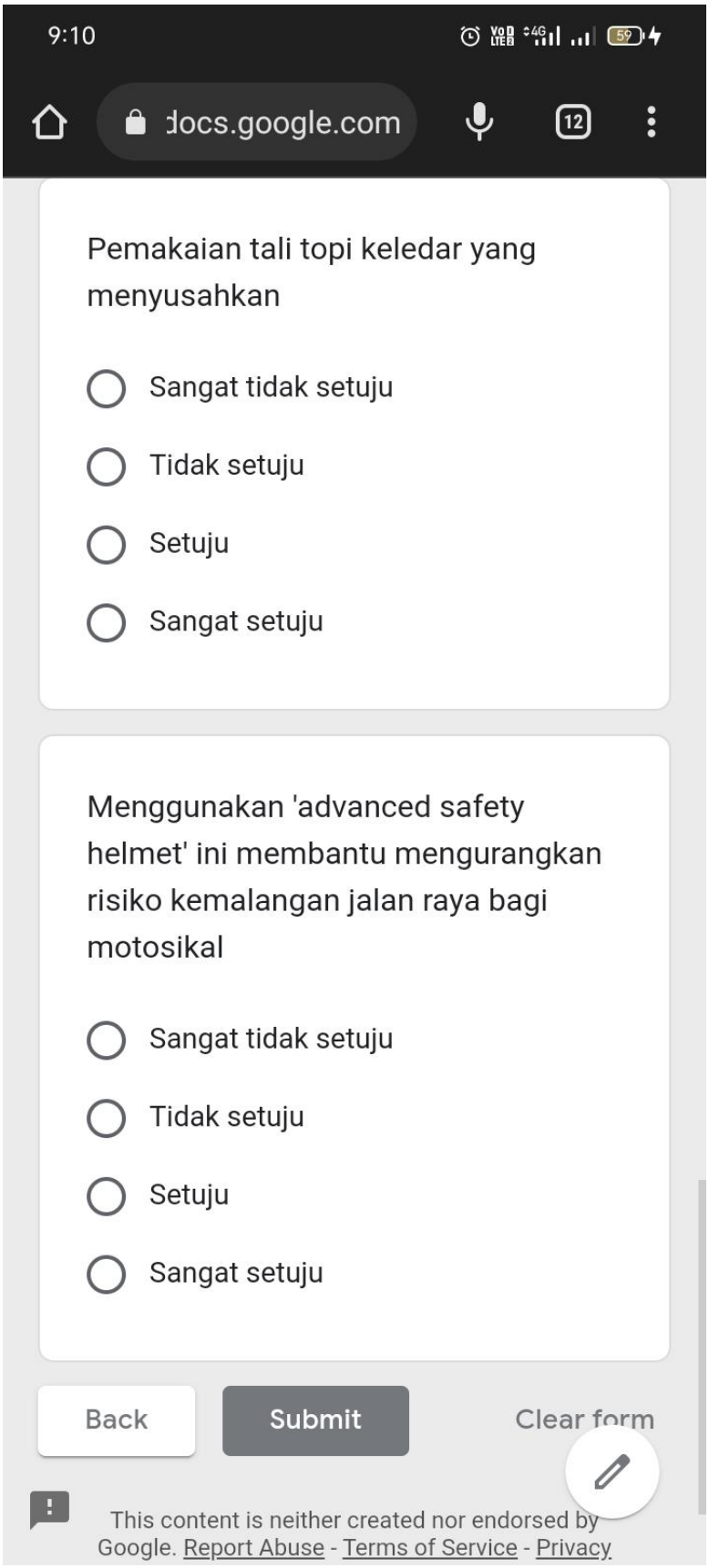
APPENDIX 1

Question form




9:10
docs.google.com
12
Menggunakan 'advanced safety helmet' ini membantu mengurangkan risiko kemalangan jalan raya bagi motosikal
Sangat tidak setuju
Tidak setuju
Setuju
Sangat setuju
'Advanced safety helmet' ini membantu mengingatkan untuk memakai topi keledar dengan betul
Sangat tidak setuju
Tidak setuju
Setuju
Sangat setuju
Topi keledar menyebabkan sakit leher


9:10
Topi keledar menyebabkan sakit leher
Sangat tidak setuju
Tidak setuju
Setuju
Sangat setuju
Memakai topi keledar menyebabkan keterbatasan dalam pergerakan leher dan kepala
Sangat tidak setuju
Tidak Setuju
Setuju
Sangat Setuju
Pemakaian tali topi keledar yang menyusahkan
Sangat tidak setuju


9:10
docs.google.com
12
Pemakaian tali topi keledar yang menyusahkan
Sangat tidak setuju
Tidak setuju
Setuju
Sangat setuju
Menggunakan 'advanced safety helmet' ini membantu mengurangkan risiko kemalangan jalan raya bagi motosikal
Sangat tidak setuju
Tidak setuju
Setuju
Sangat setuju
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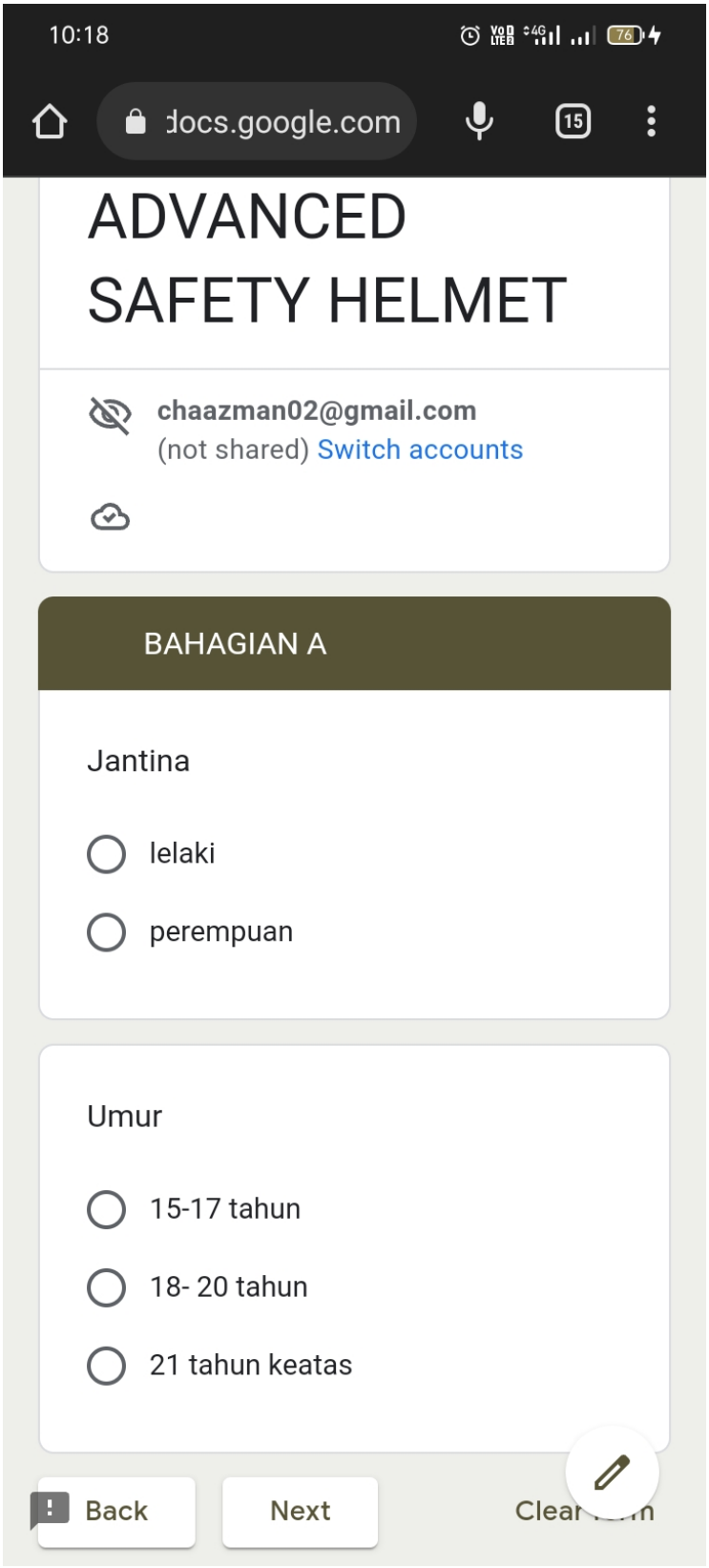
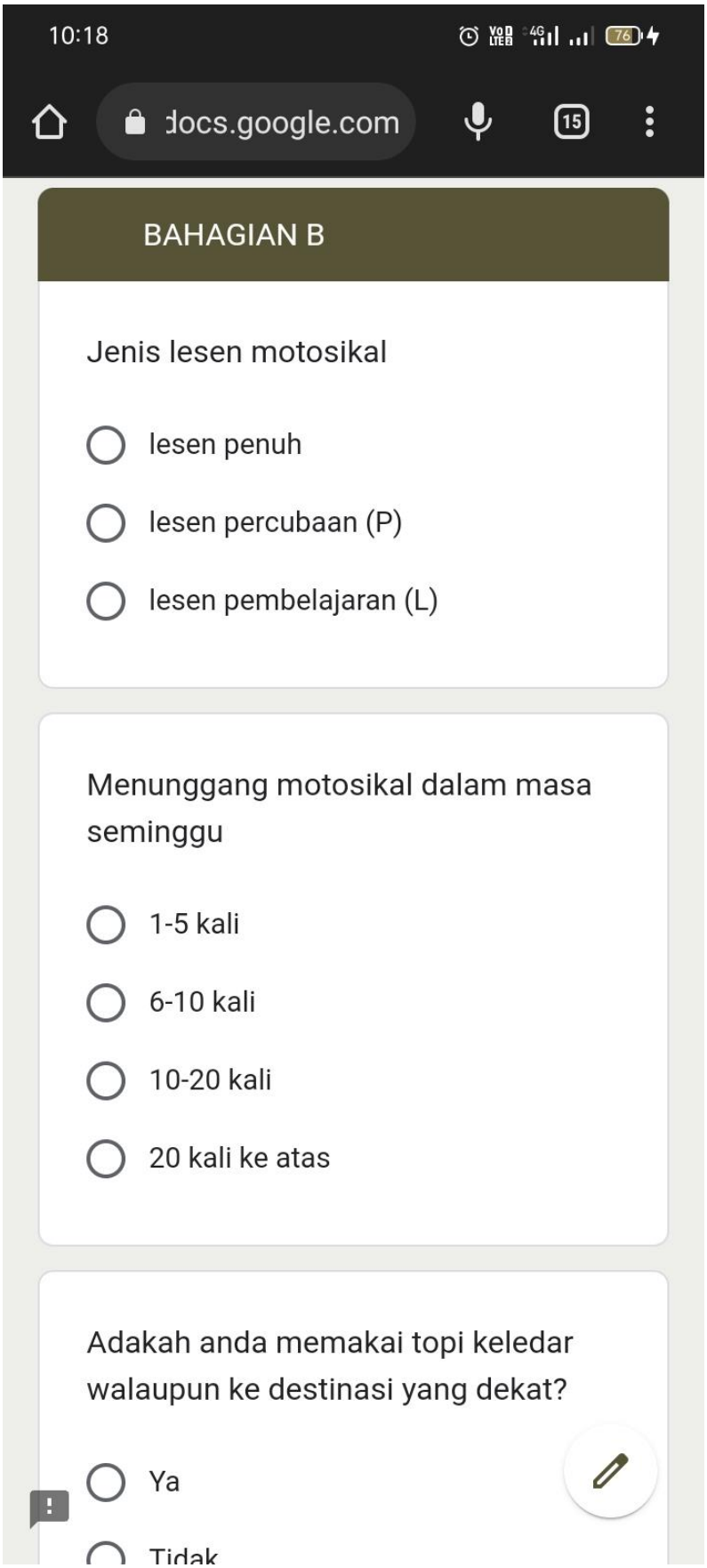
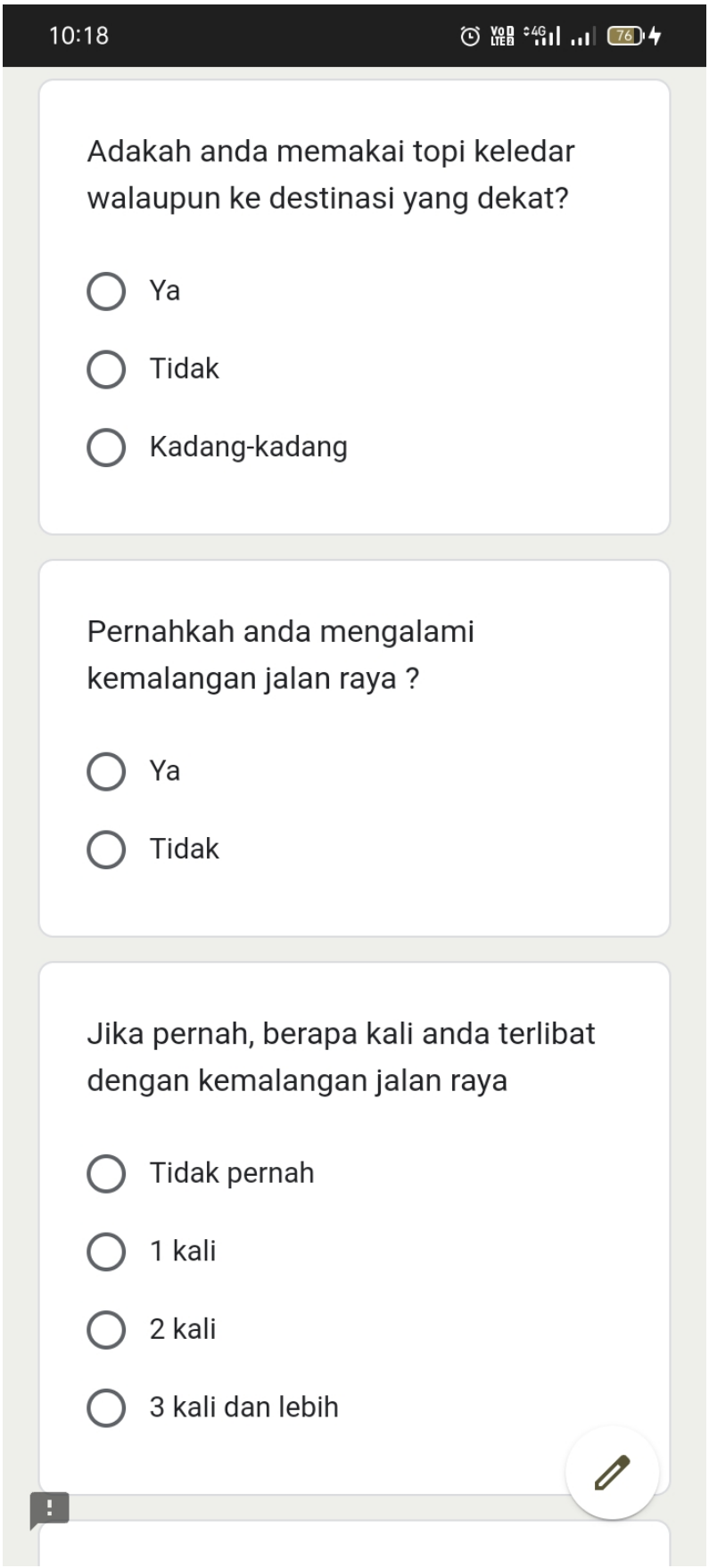
APPENDIX 2

Question form




10:18
docs.google.com
15
BAHAGIAN B
Jenis lesen motosikal
lesen penuh
lesen percubaan (P)
lesen pembelajaran (L)
Menunggang motosikal dalam masa seminggu
1-5 kali
6-10 kali
10-20 kali
20 kali ke atas
Adakah anda memakai topi keledar walaupun ke destinasi yang dekat?
Ya
Tidak


10:18
Adakah anda memakai topi keledar walaupun ke destinasi yang dekat?
Ya
Tidak
Kadang-kadang
Pernahkah anda mengalami kemalangan jalan raya ?
Ya
Tidak
Jika pernah, berapa kali anda terlibat dengan kemalangan jalan raya
Tidak pernah
1 kali
2 kali
3 kali dan lebih

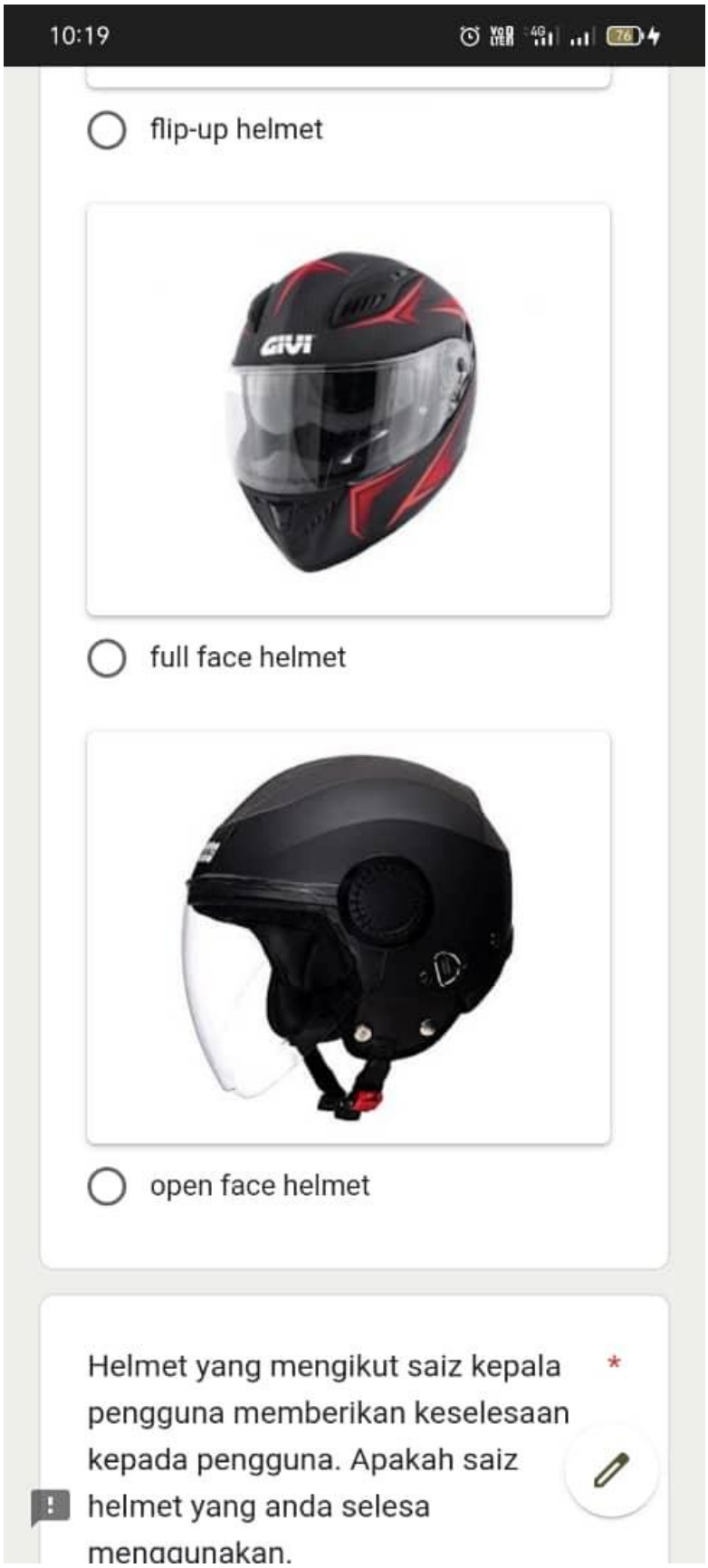
10:19

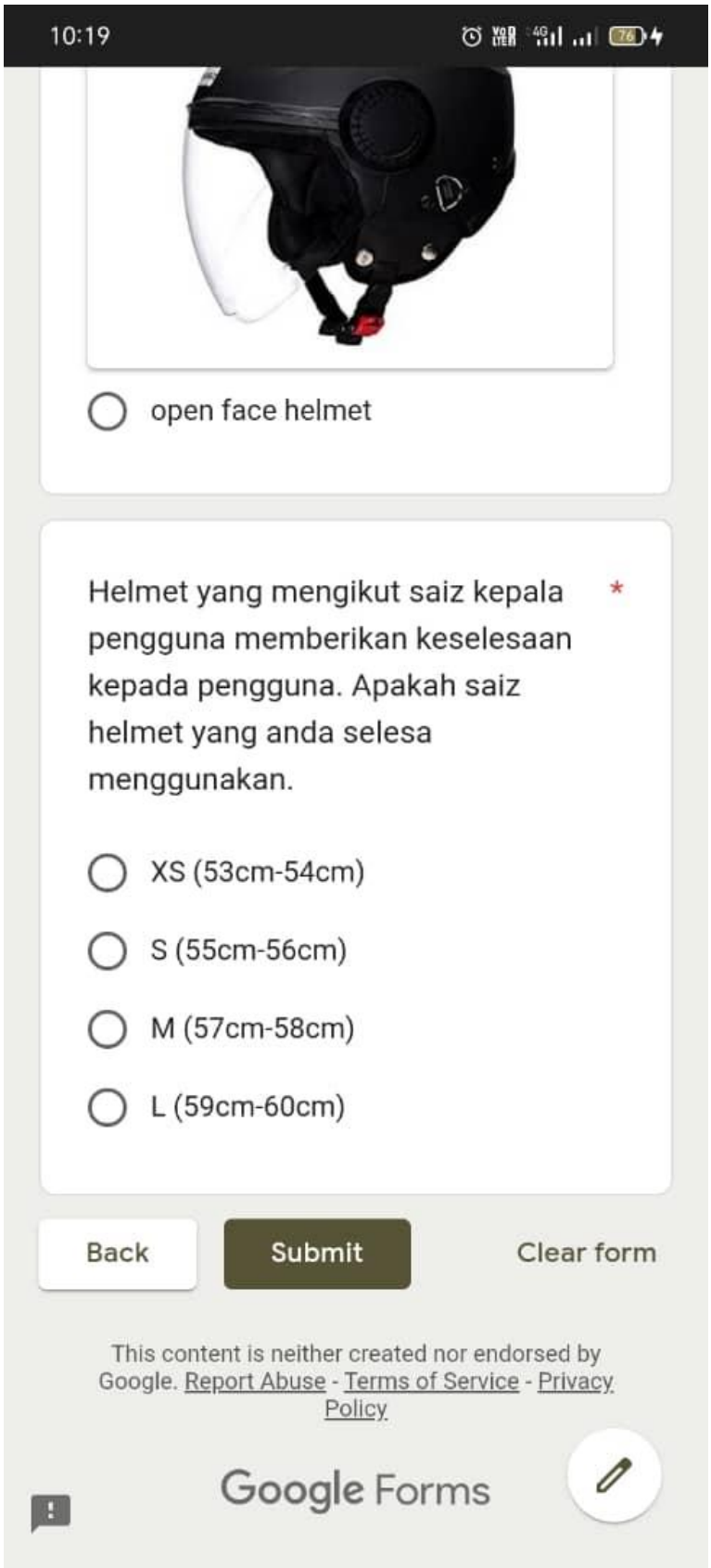
Apakah faktor pengguna motosikal tidak memasang tali topi keledar semasa menunggang motosikal ? *

- Terlupa
- Malas
- Ingin cepat

Apakah jenis topi keledar yang anda lebih selesa menggunakan : *

- half-helmet


10:19
flip-up helmet
GIVI
full face helmet
open face helmet
Helmet yang mengikut saiz kepala pengguna memberikan keselesaan kepada pengguna. Apakah saiz helmet yang anda selesa menggunakan. *


10:19
open face helmet
Helmet yang mengikut saiz kepala pengguna memberikan keselesaan kepada pengguna. Apakah saiz helmet yang anda selesa menggunakan. *
XS (53cm-54cm)
S (55cm-56cm)
M (57cm-58cm)
L (59cm-60cm)
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APPENDIX 3

GANT CHART