



**POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ  
SHAH**

**‘EXCUSE ME’**

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**MECHANICAL ENGINEERING DEPARTMENT**

**SESSION I: 2022/2023**

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**This report is submitted to the Department of Mechanical Engineering as  
fulfilling part of the conditions of the award Diploma in Mechanical  
Engineering**

**MECHANICAL ENGINEERING DEPARTMENT**

**SESSION I: 2022/2023**

**AKUAN KEASLIAN DAN HAK MILIK**

**EXCUSE ME**

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2. Kami mengakui bahawa 'Projek tersebut di atas' dan harta intelek yang ada di dalamnya adalah hasil karya/ reka cipta asli saya tanpa mengambil atau meniru mana-mana harta intelek daripada pihakpihak lain.
3. Kami bersetuju melepaskan pemilikan harta intelek 'Projek tersebut' kepada 'Politeknik tersebut' bagi memenuhi keperluan untuk penganugerahan Diploma Kejuruteraan Mekanikal kepada kami.

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Sebagai Penyelia projek pada tarikh 9/12/2022



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## **APPRECIATION**

Bismillahirrahmanirrahim. Assalamualaikum wbt, and hello. Firstly, thanks be to Allah S.W.T. for, with His permission and abundance of grace, we managed to complete the project report "EXCUSE ME" in the allotted time with the existence of cooperation and helping each other.

So we would like to thank our project supervisors, Isnuraini Binti Kassim@Ismail and Norsa'aidah binti Sa'aid who have guided us and provided guidance from beginning to end until we successfully completed this final project report.

Then, thanks to our friends who provided us with suggestions for improvement, Finally, the panel or lecturers involved in the development of this project also gave a lot of advice or ideas that could further strengthen our project report.

## **ABSTRACT**

It was challenging for deaf people to work with people who could not communicate like normal people because they still had limbs that could work normally. Communication was essential while working, especially in the event of an emergency or a problem. This project was based on an aid used by deaf people in workshops or working areas to communicate with lecturers or supervisors called "Excuse Me." The goal of this project was to design and develop a two-way device system for emergency and communication purposes for the deaf. There were several areas of study that had been defined for this product's use of Internet of Things (IOT) messaging protocols that link apps with Arduino to provide output. All were designed to address issues that may develop, such as communication challenges or the need to issue emergency alerts if a lecturer or supervisor was away during a task. A wi-fi connection and applications were required for the project to establish two-way communication. This project would solve communication problems in the work area for people with disabilities such as the deaf. Additionally, these tools could help certain groups communicate more effectively.

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# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 INTRODUCTION**

The administration is always working to boost the economy of the country. The industrial sector is one of the areas that can have a substantial impact on the national economy (Khairul Fizrd, 2019). As a result, there are numerous factories located both in the city and the countryside. Residents are encouraged to move to places like major cities because of this predicament. All societies have numerous chances to work in the sector; the key is to be skilled in handling the employment that the employer provides. As a result, some topics, such how special groups like the deaf and dumb work in the sector, are frequently discussed in society.

Special groups are divided into two categories for general information: physical weakness and mental weakness. They also have unique benefits and drawbacks (Noraini Mohd Noor and Haslina Mohamad, 2018). Even those with physical limitations like the deaf and dumb cannot communicate like regular people because they still have limbs that can work normally. They find it challenging to simply continue managing the task because of this. this is since communication is crucial when working, especially in cases of emergencies or problems.

Technology that can transport the information that needs to be communicated is known as a communication tool. For this demographic, communication technologies are still becoming less common, especially in workshops. When there is danger at work, communication methods are also crucial. As a result, the deaf and dumb have a great requirement for this matter. with assistance from communication aids. Even at a distance, they will be more comfortable and simpler to control. In workshops for the deaf and dumb, this project focuses on communication aids.

## 1.2 PROJECT BACKGROUND

Deafness generally falls within the category of mild hearing impairment. An audiometer is a specialised tool used to assess the severity of hearing loss in a person. According to Mohd. Shakil Razi (April 2000), hearing impairment refers to a deafness level of less than 55 decibels. Any area of the outer ear where there is a decrease of flow hearing can cause it. The received sound is focused and sent through the auditory canal and eardrum to the ear. The middle ear cannot receive sound vibrations adequately when there is an impediment caused by an obstruction or other unexpected interference. Hearing loss is not a dangerous condition, and the use of a hearing aid can help those who are hard of hearing. FM system and hearing aid model BTE/303 On the back of the earlobe is where a hearing aid is attached. It includes a tester, such as a stethoclip, a battery tester, and a water puffer that removes water and steam from the tube. While a brush is provided to clean the tool of any filth. Additionally, pupils who are profoundly deaf use the FM Transmitter Receiver equipment to speak with their teachers. Students can hear what the teacher is teaching when they use this tool. Additionally, a red-light indicator that recognises a sound wave can be used by teachers to determine whether students have heard a message.

If the evolution of deaf people's communication tools were looked at more closely It was discovered that there are numerous ways for deaf individuals to communicate in Malaysia. The entire communication method, the hand-based Bahasa Malaysian coding method, American sign language, Chinese sign language, and numerous unofficial deaf people's communication techniques are among them. According to Liew Yoon Loy, deaf individuals use various strategies in addition to the oral/aural method, cued speech method, and natural signalling techniques like manualism. According to Tan Chin Guan, there are two stages in the development of language in deaf persons. first, known as the oracular approach. Second, there is the manualism approach. In the framework of the evolution of sign language, deaf people today significantly dominate both techniques.

### **1.3 PROBLEM STATEMENT**

It is important to consider how difficult it is for lecturers or supervisors to communicate with deaf people during training or at work, especially in matters of safety, giving and receiving instructions, control and monitoring. It is difficult to communicate or give emergency warnings if the presence of the lecturer or supervisor is far from this group during practicals or work. This is because most institutions and workplaces still lack technology or tools for safety facilities for peoples who are deaf because they pay less attention to this group. This is important because everyone, including the deaf, should prioritize their safety whether participating in training in a workshop or working in industry because it affects themselves and others around them.

### **1.4 OBJECTIVE**

This study was conducted to achieve the following objectives:

- i. Design and develop two-way communication system for the deaf
- ii. Alert the deaf in advance of an emergency

### **1.5 QUESTION**

- i. How can two-way communication systems benefit the deaf ?
- ii. How to communicate with the deaf in a working area?
- iii. How do we solve the communication challenges presented by the need to issue an emergency alert for the deaf?

### **1.6 SCOPE OF THE PROJECT**

This product is equipped with a two-way communication system as well as notifications for the deaf for emergency and communication needs. This product uses the Internet of Things (IoT) messaging protocol by connecting the application and Arduino and provides the corresponding output. It is specially designed for the deaf during practical work. This product can be used in industry and workshops at educational institutions.

## **1.7 IMPORTANCE OF THE PROJECT**

Specifically to students and employees who are deaf while undergoing training or working in workshop and industry. An efficient safety system for the use of students and employees with disabilities is extremely important. This can protect them from any unwanted accidents. The effect of this product, can further increase the safety efficiency that can reduce the death rate for the deaf in Malaysia. Due to the small and easy-to-use wristband-like design and size, this product is very suitable for use by students or workers. Therefore, this user-friendly device is designed with comfort and suitability in mind for use in the workshop or industry. Thus, the lack of technology on the market designed specifically for people with disabilities is very disappointing. This can show that this society does not attach importance to the safety of the deaf as a priority.

## **1.8 DEFINITION OF TERMS/DEFINITION OF OPERATIONS**

The idea behind this project is to facilitate communication between deaf people in case of emergencies as well as during workshop activities. The goal of the research is to monitor and control them during practical sessions by making deaf people aware.

Among the groups involved are lecturers and students in the workshop as well as supervisors to workers in the industry.

## **1.9 SUMMARY**

In conclusion, by using this communication system, we can assist unique individuals in carrying out workshop work. As a result, we got the notion to design this product specifically in the workshop and industry. Consequently, this product is appropriately created using a particular procedure.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

**(MUHAMMAD ALIFF BIN HASNAN)**

This communication system, which is a system specifically designed for deaf working in workshops or other settings, will emit a vibration that may be picked up by this group. The purpose of communication system is to signal and communicate with this group from a other distance. Although this specific category is described as those who have long-term physical, mental, intellectual, and sensory disabilities, their disadvantages are currently being lessened even though they should have the same rights as everyone else.

#### **2.2 CONCEPT/THEORY**

**(MUHAMMAD ALIFF BIN HASNAN)**

Communication can be defined as the process of transmitting information and common understanding from one person to another (Keyton, 2011). It is the creation or exchange of thoughts, ideas, emotions, and understanding between sender and receiver. It is essential to building and maintaining relationships in the workplace. Although administrators spend most of their time communicating, one cannot assume that meaningful communication occurs in all exchanges (Dunn, 2002). Once a memorandum, letter, fax, or e-mail has been sent, many are inclined to believe that communication has taken place. However, communication does not occur until information and understanding have passed between sender and the intended receiver. To make oneself understood as intended is an important part of communication. A receiver may hear a sender but still not understand what the sender's message means. Being constantly engaged in encoding and decoding messages does not ensure that an

administrator is an expert in communication. Understanding is a personal matter between people, and different people may interpret messages differently. If the idea received is not the one intended, communication has not taken place the sender has merely spoken or written. (Akua Ahyia Adu-Oppong, 2014)

In the era of high technology, safety is the utmost important thing that should be practised in all the workplaces especially workshops. Safety in a school workshop environment is very important for the students and staff. Technicians, cleaners and also visitors in the workshop are equally important as all the people need to be safe. The working atmosphere in a workshop must have the basic elements to ensure a safe and healthy environment. It can be very dangerous even though a simple mistake occurs when the safety procedures are compromised. Hazardous circumstances will bring harmful scenarios. The potential for a hazard to cause harm to the students and teachers in a school workshop is high (Adamu & Idris, 2016). Dangerous situations can develop at any time in a workshop if the people who use the workshop are not alert; therefore, teachers or the workshop caretakers have a vital role to play to make sure the safety of everyone in the workshop. Teachers can create a responsible and disciplined attitude in their pupils from the way they control the sessions in the workshop. Chemical substances, all kinds of tools, furniture, electronic equipment, decorative plants, and many more can cause harm to a human being if it is not well managed in a school workshop. A smooth teaching and learning session in a workshop can take place via systematic management. Vocational education which includes Occupational Safety and Health as a fundamental study will have the advantage of students adopting a safe work procedure within the vicinity of their workplace (Okun, Andrea, Rebecca, Guerin, & Paul Schulte, 2016).

In this study, the social security system's categories and the idea of disability are addressed. It claims that there is a definitional disagreement surrounding the concept of disability. This indicates that there is ongoing discussion over the ideas or factors that will be used to present a "correct" picture of disability as a phenomenon. Disability discourse pits the biological and social theories of impairment against one another. This work discusses the areas of interest each of these understandings generates. It is based on empirical data from a study of social security eligibility for disability in Sweden.

The study erased what was seen to be a shortcoming in this argument after tracking public debate documentation for 25 years. Choosing which concept of disability to use is an ongoing struggle between medical and society understanding in this social security scheme. The study argues that this viewpoint is challenging when it comes to viewing biology as a modern concept and disability and the social model as archaic ideas. Disability is therefore a complex and multifaceted notion, making it challenging to give it a clear and constricting definition. ( Marianne Hedlund 2010)

It's important to emphasise that this approach does not rule out having a crippled body or having first hand experience with impairment. However, the phenomenon of fault growth is the main focus, not simply one specific instance. The most popular method used by people to share their experiences and establish the truth or facts about a subject is communication. This suggests that there will be a desire to talk about the reality known as a "defect" in addition to its existence. Every communication will have guidelines and standards for framing a phenomenon. We can respond to and comprehend disability more effectively when we use communicative framing.

### **2.2.1 DISABILITY**

**(MUHAMMAD ALIFF BIN HASNAN)**

Congenital disorders, or birth defects, are conditions present at birth regardless of the underlying cause. Physical, intellectual, or developmental problems may occur from birth abnormalities. These impairments can be modest or severe. Birth defects can be split into two categories: structural disorders, which affect the structure of bodily components, and functional diseases, which affect how the body functions. Degenerative and metabolic illnesses are examples of functional disorders. structural and functional abnormalities are examples of birth defects.

Genetic or chromosomal problems, exposure to specific medications or chemicals, or specific illnesses during pregnancy can all result in defects. Lack of folate, drinking alcohol or smoking while pregnant, poorly controlled diabetes, and moms older than 35 are risk factors. Many are thought to include a number of variables. Birth malformations

can be identified through screening tests or can be seen at birth. Different prenatal screenings can find some problems before delivery. (Wikipedia, 2019)

### **2.2.2 DIFFERENTIATE THE TYPES OF DISABILITY (MOHAMAD FALIKH MU'TASHIM BIN AZMAN)**

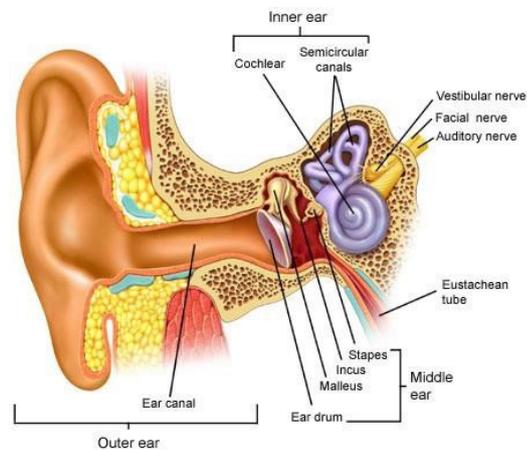
Even though one person has the same type of handicap as another, disabilities might affect them in different ways. According to the most recent data given by the US Census Bureau, approximately 56.7 million Americans in 2010 had at least one type of impairment. This represents 18.7% of the population of the United States, making it one of the country's most pressing public health issues. Each type of impairment has a different prevalence depending on the age group, ethnicity, and demographic region. (Matthew Wallace, 2019)

A disability is defined as a condition or function that is severely impaired in comparison to an individual's or group's customary standard. Physical impairment, sensory impairment, cognitive impairment, intellectual impairment, mental illness, and many types of chronic disease are all examples of individual functioning. Physical and social environmental factors play a role in disability outcomes, according to disability classifications. Even when a person has the same type of handicap as another, disabilities might affect them in various ways.

Hearing, movement, vision, thinking, learning, communication, mental health, memory, and interpersonal relationships are all affected by various sorts of disability. Some infirmities are more outwardly visible than others. Furthermore, impairments might strike at any time in a person's life.

## 2.2.3 DEAF AND DUMB PROBLEM DISABILITY

(MOHAMAD FALIKH MU'TASHIM BIN AZMAN)



**Figure 2.1 Structure of the ear (www.hearlife.com)**

### Deaf Disability

The sense of hearing is one of the five senses that people value. The ear can impact the typical hearing rate by up to 20 decibels. This rate will exceed 40 decibels for the deaf. According to WHO statistics, more than 5% of the world's population, or 466 million people, suffer from hearing loss (432 million adults and 34 million children), and it is predicted that by 2050, more than 900 million people, or one in every ten people, would have hearing loss. (Intervensiawal ,March 2021)

According to estimates, 2.5 million people in Malaysia, mostly teens, have hearing loss that is avoidable. A person may feel isolated from the outside world because they cannot understand what is being said or they may feel anxious about oneself when this sense is skewed or missing.

### Types of Deaf disability

- a) Conductive

Because of issues in the middle and outer ear, or because of an obstruction in the ear, such as earwax, which stops sound from reaching the eardrum. It can be permanent, but it's more likely to be transient and treatable with clinical therapy.(MyHealth Kementerian Kesihatan Malaysia ,12 October 2022)

#### b) Sensorineural

Sensorineural hearing loss is the most common. It is permanent and is caused by problems in the inner ear or the auditory nerve. Individuals with sensorineural hearing loss typically have difficulty understanding a voice or speech even if it is loud enough to be heard. The sound received also becomes variable as the waves become uneven even with the use of hearing aids.

#### c) Mixed

Is a hybrid of the conductive and sensorineural types.

Less, moderate, severe, and very severe hearing loss are the four levels of hearing loss. Deafness or deafness is another term for significant hearing loss

#### Causes of Deafness Problems

Among the causes of hearing impairment or deafness are:

- i. History in family members who have had the disease
- ii. The baby is not born heavy enough
- iii. Minor current bacterial infections such as rubella and syphilis (syphilis)
- iv. Bacterial infection in the brain
- v. The use of drugs such as chemotherapy, aspirin, and diuretics
- vi. Prolonged exposure to loud noises such as gunshots, firecrackers, explosions, and rock concerts
- vii. Collection of earwax that thickens and hardens
- viii. The eardrum ruptures
- ix. Increasing age

## **Dumb disability**

A person's incapacity to speak is referred to as dumb. This is caused to a lack of or malfunction of the tools for speech, such as the oral cavity, tongue, palate, and voice cords, among other things.

The most common reason of muteness is loss or impaired hearing (deafness) or speaking function (deafness) due to a congenital defect, an accident, or disease.

### **Dumb features among others:**

- i. Do a lot of body movements
- ii. Often see other people's body movements and lip movements
- iii. Speak loudly but it is not clear what is being said
- iv. Chipped lips

### **Causes of mute among others:**

- i. Hypertension
- ii. Genetic factors or heredity from parents
- iii. Food poisoning
- iv. Neonatorum tetanus (a disease that attacks babies at birth)

### **The cause of the dumb problem**

Physically mute people may have issues with components of the human body that are required for human speech (such as the throat, vocal cords, lungs, mouth, or tongue, etc.). A person who is dumb is frequently confused with the deaf, as someone who has been deaf since birth may have difficulty pronouncing words correctly (see deaf and dumb), whereas dumb refers to someone who can hear but not speak. Intellectual impairment and autism are two other factors. A person can

be born deaf or become deaf because of an injury or sickness later in life. The rate of dumbness because of everything is 0.8 individuals per 1,000

#### **2.2.4 HOW THE DEAF PEOPLE CONVERSE (NORSYAFIQAH BINTI MD YUNUS)**

Deaf persons can communicate in a variety of ways. The comprehensive nonverbal communication approach is one of them. If we examine the viewpoints put forth by Hamzah Osman in 2002, the researcher discovered that it is true. This is demonstrated by the fact that deaf individuals communicate (non-verbally) through short service systems (SMS), the quickest and most modern means of communication. They also utilise the widely used Facebook today. The ability to communicate the nonverbal form is not restricted to just one component. Print and electronic media are included, both of which are seen as having a significant impact on the deaf. Books, newspapers, magazines, letters, and other print media are among the deaf community's primary means of communication today. Television, VCD recorder, DVD, digital camera, fax, computer with internet access, slideshows, PowerPoint, and other electronic media are examples of non-electronic media. Through paid marketing, deaf individuals keep up with the advancement of electronic media devices. This demonstrates that deaf people can converse with other deaf people without utilising language.

According to Teh Kean Hoe's (2006) article, the deaf people of Malaysia utilise a variety of international sign languages, including American Sign Language, Chinese Sign Language, Sign Language India, and the Malaysian Signal, to communicate. However, the variety of ways that the deaf use international sign language can lead to some confusion among them. This might compromise communication efficiency.

Additionally, the language used by deaf people to communicate is developed based on varied usage and cultural backgrounds. Different cultural backgrounds refer to regional customs, educational attainment, socioeconomic standing, infrastructure capabilities, access to modern communication means, two-way communication skills,

and social curiosity. Therefore, not all deaf people communicate using sign language in the same way. Language for the deaf is also evolving in conjunction with advancements in language education and the demands of contemporary change, much as how language is used and developed for communication by hearing people. They employed manualism and oralism as early communication techniques.

## **2.2.5 EQUIPMENT/GADGET FOR DEAF AVAILABLE ON THE MARKET (NOSYAFIQAH BINTI MD YUNUS)**

From a distance they look normal, even perfect from the outside. When we start a conversation, maybe they just stare without replying with a spoken word. Born deaf and dumb or health problems that lead to this condition cause this group to have difficulty communicating with the surrounding community.

Only sign language can help them communicate and show self-expression. Sign language is a method of communication using hand, body and lip movements to convey information.

The efforts of a student at the Islamic Sciences University of Malaysia (USIM) to produce e-learning through an application called ARSOM to make it easier for the deaf and dumb to read the Quran. Young researcher from the Faculty of Science and Technology Mohd Aqil Irwan Abdul Mutalib said ARSOM is an Android application designed specifically for the group to recognize hijaiyah letters in sign language (Arabic sign language).

He said, the idea was sparked when he understood the difficulties faced by those groups in learning every content in the Quran. "At that time I realized that if I were a deaf person, it would be very difficult to communicate and learn to read the Quran, so this idea came about. I am sensitive to the difficulties faced by the deaf and mute community in learning to read the Quran. This is because the Quran is the main pillar in performing prayers and requires a continuous learning phase to master it. I hope that ARSOM can be accessed worldwide by the deaf and mute community just as WhatsApp and

Instagram can be accessed worldwide by us as normal people". - Article Bernama ,20 August 2018



**Figure 2.2 Hearing Aid**

A research group from Universiti Teknikal Malaysia Melaka (UTEM) successfully developed Handroid - Sign Language Translitar.



**Figure 2.3 Handroid**

RIE (receiver-in-the-ear) is a hearing aid with the position of the receiver or speaker placed in the ear canal



**Figure 2.4 RIE (receiver-in-the-ear)**

## **2.2.6 SAFETY FOR DEAF (NORSYAFIQAH BINTI MD YUNUS)**

### **1. Get Customized Alarms for People with Hearing Loss:**

Can't hear but can feel movement. For example, by installing flashing lights to let you know if someone is at the door or window.

If you have a smartphone, you can also get an app that alerts you when someone is at the door by vibrating your phone.

### **2. Bring Other People with You When You Go Out:**

If possible, bring someone with you who is not struggling to hear. If that's not possible, request that people face you when talking to you so they are easier to hear.

### **3. Avoid Distractions While Driving:**

Because you can rely less on your hearing, it's important to minimize other distractions behind the wheel. Don't use your phone or GPS while driving, just pull over if you need to change your route. If you suspect you have an issue with your hearing aid, see your hearing care specialist before getting behind the wheel.

### **4. Consider a Service Animal:**

You think of service animals as helpful for those with visual impairment, epilepsy, or other disorders. But they can also be very helpful to those with auditory challenges. A service dog can be trained to alert you to danger. They can inform you when someone is at your door.

#### 5. Adjust Yourself to Visual Cues When Driving:

Your hearing loss has likely gotten worse over time. If your hearing aids aren't regularly adjusted, you might find yourself relying more on your eyes. Be alert to flashing lights on the road since you may not hear sirens. When children or pedestrians are around, stay extra vigilant.

#### 6. Get to Know Your Neighbors:

In many neighborhoods today, sadly, many people don't know their neighbors. This lack of connection adds risk to both the hearing and the hearing impaired alike. Find opportunities to get to know the people in the homes around yours. Keep each other informed of suspicious activities you may need to be on the lookout for. You never know when you may need their help!

#### 7. Share Your Limitations with Friends and Family:

No one wants to admit that they have hearing loss, but those close to you need to know. They can alert you to something you may not hear so that you can go to safety. If they don't know that you can't hear, they will assume that you hear it too.

#### 8. Keep Your Car Well-Maintained:

As a person living with hearing loss, you may not be able to hear strange thumps, clicks, or screeches when you drive. These can signal a serious problem. If ignored, they can do long-term damage to your car or put you in danger. It's a good idea to ask a trusted mechanic for his opinion on the condition of your vehicle when you take it in for an oil change or inspection.

## 9. Treat Your Hearing Loss:

This is the most critical thing you can do to stay safe. Get your hearing checked annually to determine when your hearing loss is significant enough to require an assistive device. Don't delay because of time constraints, money, or pride. A hearing aid can help you stay safer in many settings at home, work, park, shopping, and driving.

## 10. Phone Accommodations for Emergencies:

As we all know, the phone is a lifeline in case of emergencies. For people with hearing loss, there are many assistive devices available for phone calls. People with advanced degrees of hearing loss or partial/complete deafness may benefit from the use of video relay systems (VRS). With this assistive option, you receive American sign language interpretation through a VRS employee who will communicate your needs to emergency services.

## 11. Home Safety Alarms:

If your hearing aids are equipped with a telecoil (T-coil). This direct stream of sound can come in handy in case of emergency, and is also convenient for enjoying your home entertainment system.

## 12. Get You're Hearing Tested Annually:

An annual hearing test ensures that our hearing aids are the proper prescription for our hearing abilities, and ensure that we are always connected to the world around us. Contact us at Greentree Audiology today for a hearing test.

## 13. Fire Safety at Home:

For people who experience hearing loss, there are special alarms designed to alert a fire emergency. Consider installing a vibrating alarm or visual alarm with strobing

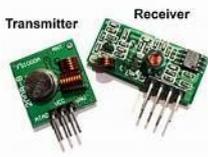
lights in your personal sleeping area, in addition to traditional fire alarms at rely only on sound.

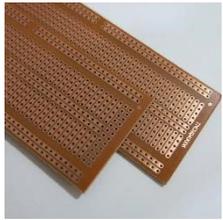
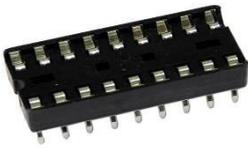
## 2.2.7 POTENCIAL EQUIPMENT

(MOHAMAD FALIKH MU'TASHIM BIN AZMAN)

### A) Component Material

This is the material that must be utilised, according to our survey, to create a circuit with a two-way system. With this, we create a two-way communication system between deaf and mute students and lecturers using transmitter and receiver components. In addition, because this project uses the 4.0 technology concept, there are also Arduino components that will create an Intelligent Of Things (IOT) system.

 <p>Transmitter Receiver</p>	Transmitter and Receiver		Arduino Uno
	Diode 1N 4007		Pin Header
	Pin Terminal Block		IC HT 12E

	Vero Board		18 Pin IC Base
 <p>47K ohm</p>	Resistor 47K		16 Pin Dip Switch
	Ceramic Capacitor 10kpf		Push to On Switch
 <p>220 ohm</p>	Resistor 220ohm		IC 7805
	Push Button Switch		Capacitor 10kpf,100mfd
	10MFD Capacitor		Jumper Wire (male ,female)
	IC HT 12D		Resistor 200E,407k

**Table 2.1 Project Materials**

## B) Potential Method of Project Development

The circuit for the project, which could be used to create a two-way system, is divided into two circuits, the transmitter circuit and the receiver circuit, as shown in the diagram below (Figure 2.2.7). The transmitter circuit is the circuit that is placed in the box that is placed on the lecturer's desk. The second circuit has a receiver, which is a circuit that will be installed in the vibration clock, as the next step. This would enable the establishment of a communication system between instructors and deaf and mute students while they complete practical tasks in the workshop.

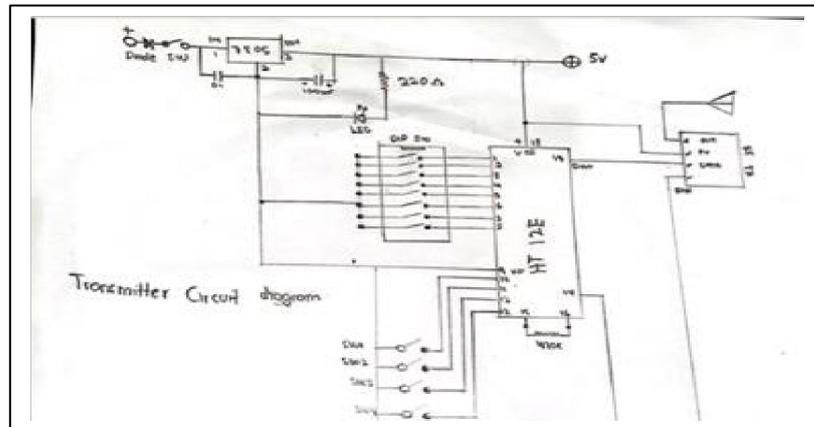


Figure 2.5 Transmitter Circuit

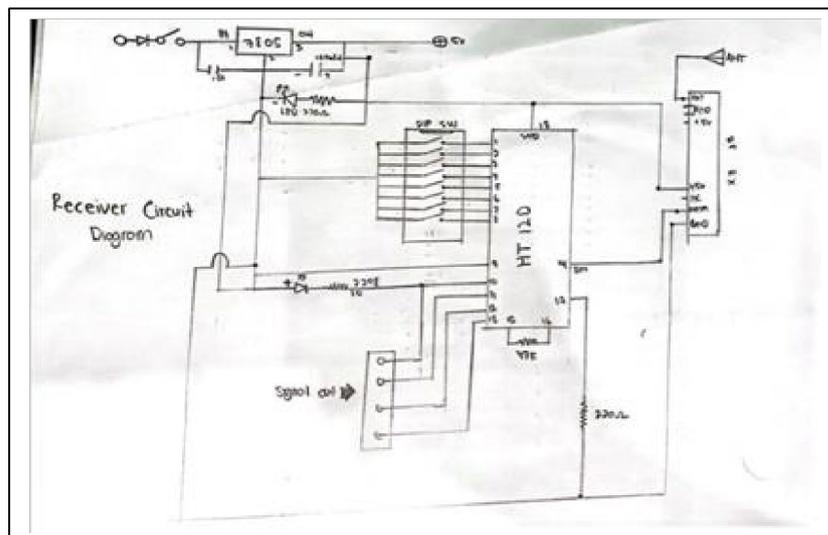


Figure 2.6 Receiver Circuit

## C) Potential Equipment for The Project

(NORSYAFIQAH BINTI MD YUNUS)

### I. Smooth Edge Body & Aluminium Alloy

Large sized surface with responsive and smooth touch. The 2.5D Curved Cover combines the surface and casing seamlessly. The body of the watch is stylish and neatly designed with aluminium alloy material. Ultra-light body only 24g\* weight - no taste when you wear it.



Figure 2.7 Smooth Edge Body

### II. Stylish Watch Group in dark color

Bands are available in a variety of dark colors to suit all your styles



Figure 2.8 Watch Band

### III. Notification to Keep You Informed at Any Time

Connect the watch to your phone to easily receive other notifications.



Figure 2.9 Notification Response

### IV. Voltage vibration

Products with voltage plugs are designed for special groups. Different branches and voltages depend on the wearer as these products may require an adapter or converter to be used on everyone. Please check compatibility before purchasing.

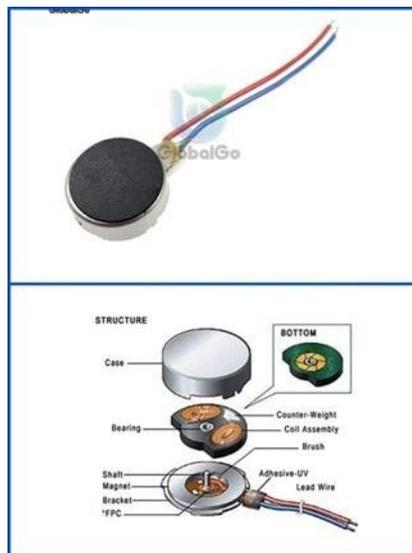


Figure 2.10 Voltage Vibration Device

## **2.3 SUMMARY**

This strategy can be utilised by special groups, particularly at the PSA Polytechnic, to facilitate everyday chores between lecturers or supervisors and students or employees while in the workshop, as it is discussed at the end of the chapter. Additionally, this product can highlight the value of everyone being safe, especially the deaf in case of an emergency in the workshop. This is due to the fact that lives are at stake, making safety a crucial issue. Therefore, this device seeks to lessen and track the risk to the deaf and dumb while they are in the workshop in the event of an emergency.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 INTRODUCTION**

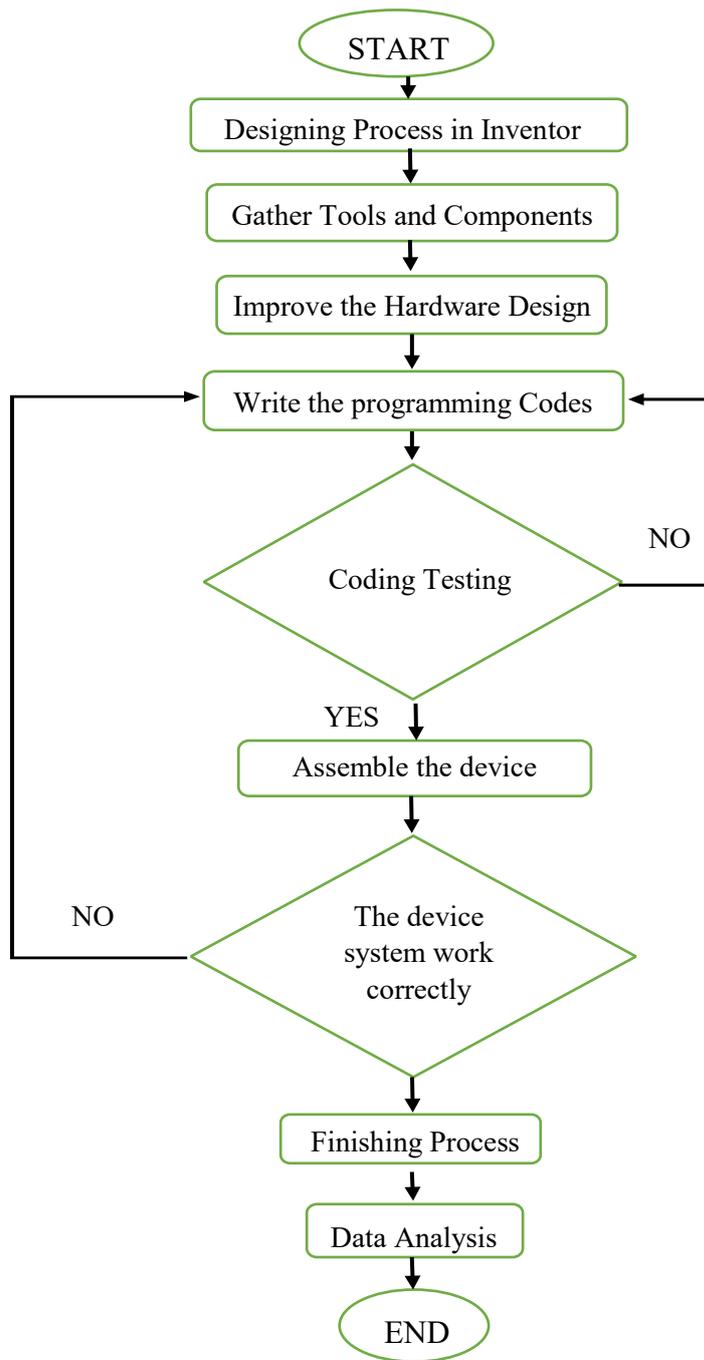
**(NORSYAFIQAH BINTI MD YUNUS)**

In the workshop or working area, this project is one of the systems employed and devoted to the deaf. The primary objective of this system is to provide users with sensitivity to emergencies while at work or in the workshop. This system uses a variety of components and IoT to boost efficiency and make it easier for users to accomplish their goals. For the lecturer and the deaf, the system also functions bilaterally to make it simpler for them to communicate with one another and exchange calls for assistance.

#### **3.2 DESIGN REASEARCH**

**(NORSYAFIQAH BINTI MD YUNUS)**

To explore this communication system for the deaf during the workshop, a fabricated product-based project and design were used in this study. Based on group discussions about the usefulness and analysis of reference data, this study's emphasis was determined. Additionally, this study aims to make a favourable difference for this group.

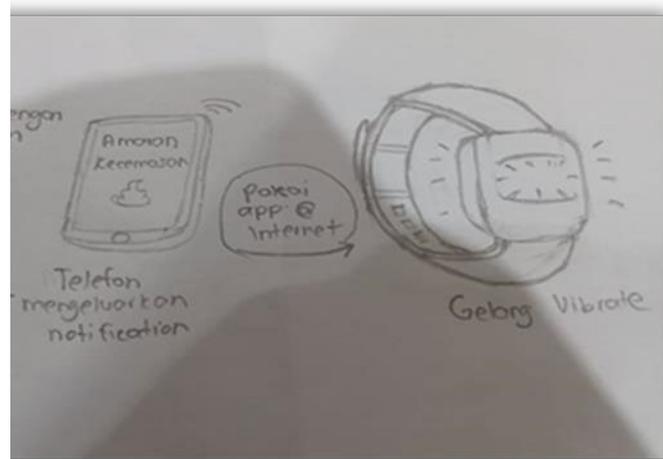


**Figure 3.1 Methodology Flow Chart**

### 3.2.1 DESIGN SELECTION PROCESS

(MUHAMMAD ALIFF BIN HASNAN)

Through cutting-edge design in the workshop, our group has created designs that are compatible with one another. On paper, we first draught a design that works with the new design. Then, in order to make the formation more precise, we started creating and positioning each item we intended to place strategically. After completing all of this, we will begin evaluating the project's effectiveness. Here are some samples of our sketch design work.



**Figure 3.2 Initial Idea of The Project**

This experimental design led us to the conclusion that the above design is the most effective one. These are the reasons why we decided on the above design, which could have an impact on some of the designs below:

#### **A) Aesthetic Value**

The designs produced are more modern and sophisticated as our project provides good technology and facilitates use during workshops.

## B) Ergonomic

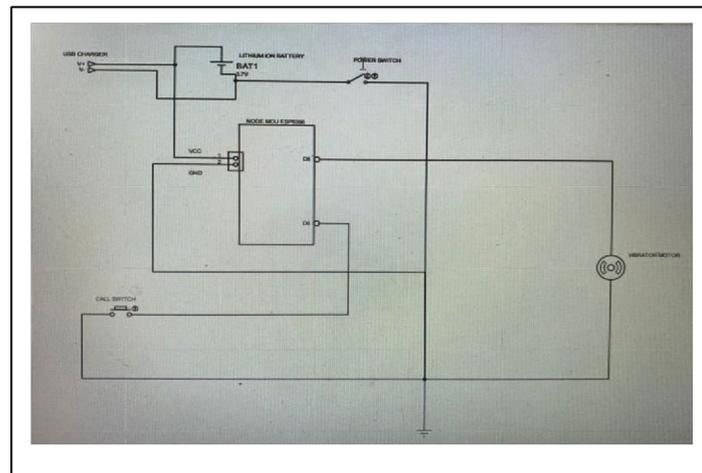
The image above demonstrates how many different elements are needed for our project to succeed. This will facilitate long-distance communication between special students and lecturers throughout the workshop because it has a variety of component functionalities.

### 3.2.2 METHODS/PROCESSES/TECHNIQUES OF PROJECT PRODUCTION (MOHAMAD FALIKH MU'TASAHIM BIN AZMAN)

#### A) Method of Project Development

##### I) Circuit Function

The Arduino IDE is a piece of software used to create code for Node MCU hardware. An application that adheres to MIT guidelines for Android application design is created. In order for the MIT application to communicate with the two Node MCU devices, the Blynk Cloud is used as a bridge between the two devices. As an operation, first, the hardware sends data to the Blynk Cloud, which then transfers it to the MIT application. Next, the MIT application sends data to the Blynk Cloud, which then transfers it to the hardware.



**Figure 3.3 Project Circuit**



**Figure 3.4 MIT Application**



**Figure 3.5 Blynk Cloud**

## II) Operation Flow

The aid will alert the lecturer or supervisor and student or employee from the lecturer or supervisor's handphone to the student or employee's device, which is located at the upper arm, as a result of this project, and vice versa. This aid will function when the switch is on. The vibration sensor on the strap will vibrate and alert the student or employee. In addition, if the student or employee needs to communicate with their lecturer or supervisor from their work station, they just tap the device, and the buzzer will buzz and the LED will light up to alert the lecturer or supervisor.

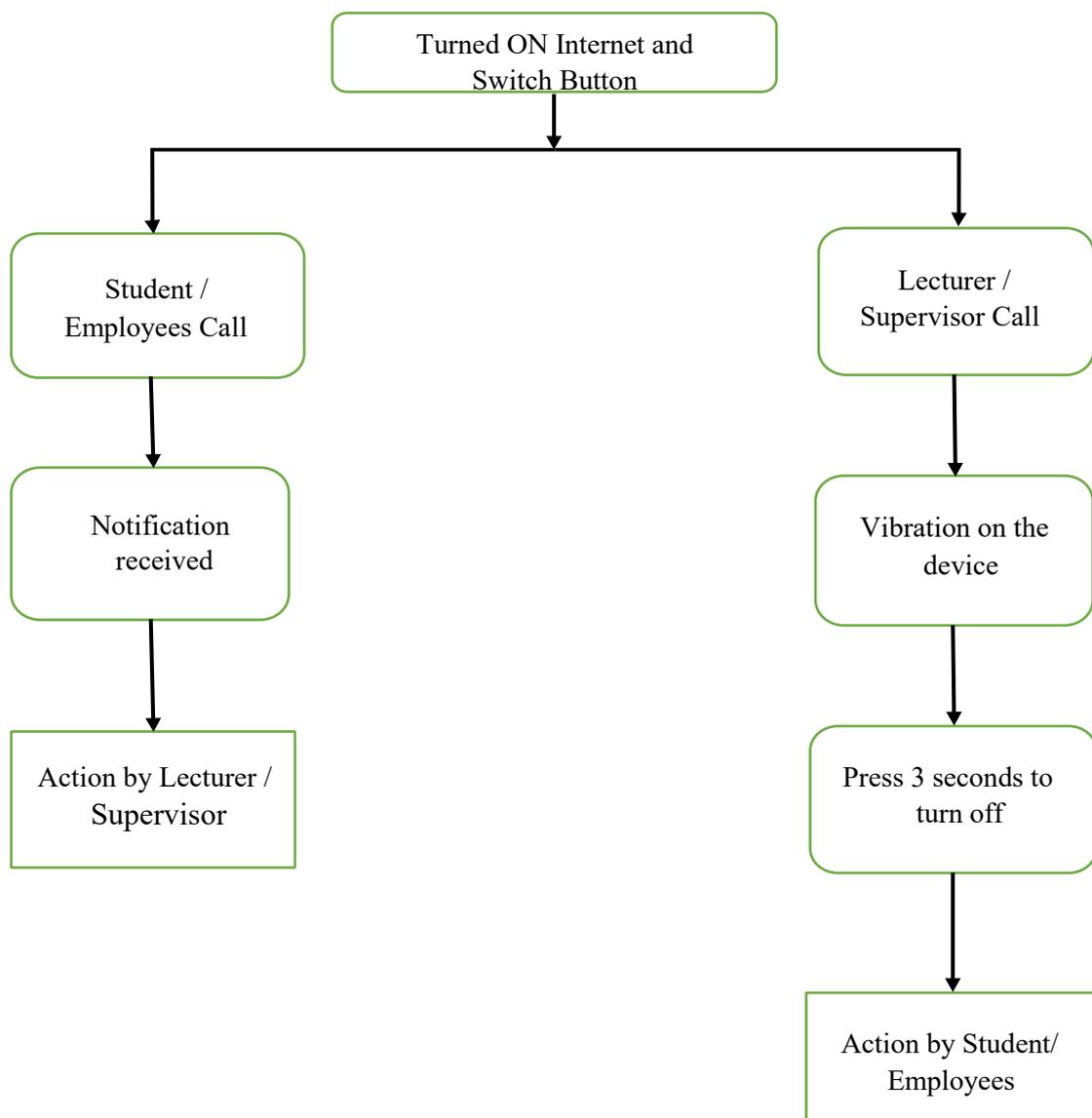


Figure 3.6 Project Operation Flow

## B) Materials and Equipment

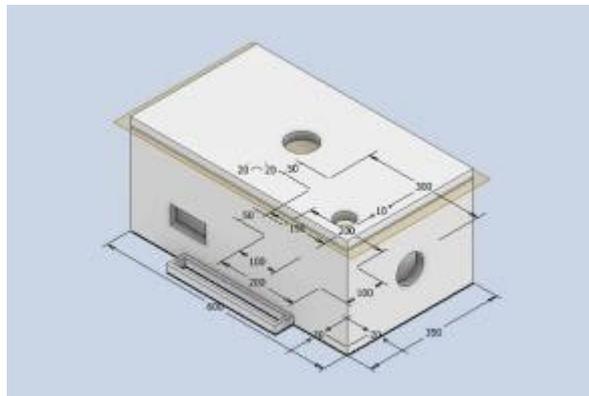
(NORSYAFIQAH BINTI MD YUNUS)

### I) Engineering Drawing

Each measurement is dependent on the component's size, which has been chosen to be used in the project's manufacturing.

Create a 2D drawing in the inventory first. The needed drawing dimensions are 6 cm and 3.5 cm in length and breadth, respectively. Take a 0.5 cm depth measurement on each side. The drawing should be "extruded" to produce a box height that is 3 cm on the sides and 0.5 cm on the bottom. Create a square hole on the box's right side that is 2 cm long and 1 cm wide. Create a 0.5 cm-radius circular hole on the left side of the casing.

Using the current measurements, create a new plan on the project casing's surface. Create a 0.5 cm-diameter circle in the centre of the casing cover. Create a 0.3 cm-radius circular hole at the casing's end.



**Figure 3.7 Project Casing Isometric View**

## II) Technical Drawing

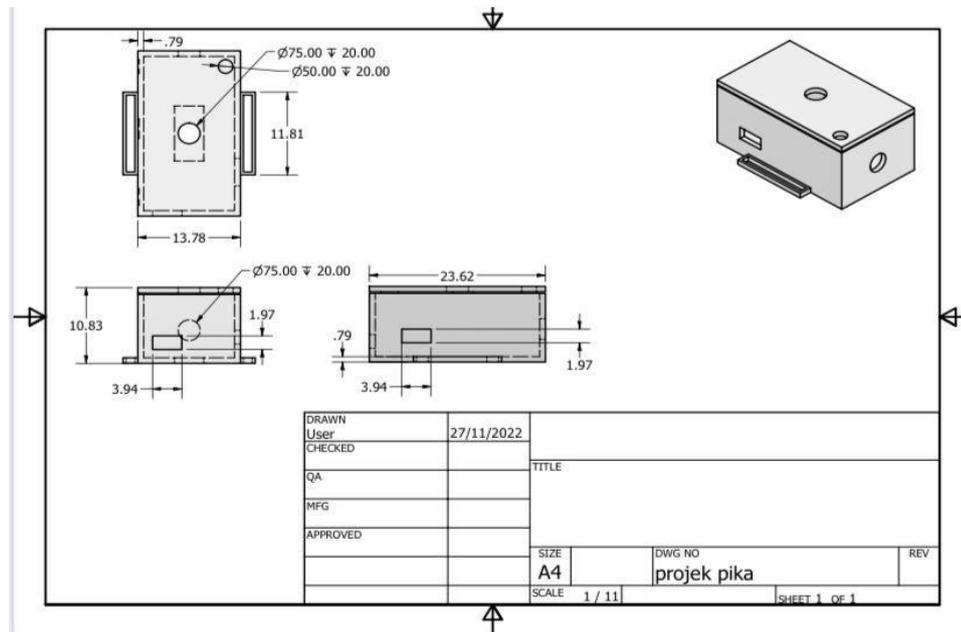


Figure 3.8 Project Casing Technical Drawing

## B) Project Cost

(MUHAMMAD ALIFF BIN HASNAN)

Cost is a crucial factor in the development of this product because it will be sold to education institutions like schools, IPTs, or businesses with deaf staff. Buyers or business owners will not be interested in purchasing the product or hiring the industrial operator to supply this facility to their staff members or to other educational institutions if the price of the product produced is higher than the price of the products already on the market. The costs of production must be accurately and meticulously calculated. The costs listed in this section are for the materials used to make our product.

NO	MATERIAL	QUANTITY	PRICE (RM)
1.	Mini Disc Vibrating Motor 1027	4	RM 18
2	315Mhz 433Mhz RF Wireless Transmitter Module and Receiver Kit 5V DC 433MHZ Wireless For Arduino Raspberry Pi /ARM/MCU WL Diy Kit	4	RM 11.68
3	10pcs 5mm Led Mixed Kit Color red green yellow blue white light-emitting diode	1	RM 1.00
4	A000005 Evaluation Board, MCU 8-Bit, Arduino Nano, AVR, Atmega328	1	RM45.45
5	759 Premium Male/Male Jumper Wires, 40 x 3" (75mm)	50	RM 4.50
6	20pcs/lot 7X7mm 7*7mm 7*7 6Pin Push Tactile Switch Self lock /Off button Latching switch Wholesale Electronic	20	RM 3.85
7.	DC3-24V SFM-20B Active Piezoelectric Buzzer Long Continuous Beep Tone Buzzer	5	RM12
8	20/22mm Nato Strap Stainless Steel Buckle for Men Women	4	RM 119.6
9	Soldering iron with wire	1	RM15
<b>TOTAL</b>			<b>RM 231.08</b>

**Table 3.1 List of the Project Cost**

### C) Project Materials And Component

(MOHAMMAD FALIKH MU'TASHIM BIN AZMAN)

The Excuse Me vibration strap's parts and materials are depicted in the diagram on (Table 3.2) as symbols. The NodeMCU ESP8266, one of the boards with the capacity to connect to the internet, is the primary component used. The NodeMCU ESP8266 is open source hardware as well, and depending on the project you want to build, you can connect it with different other parts.

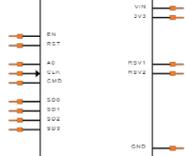
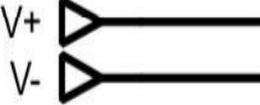
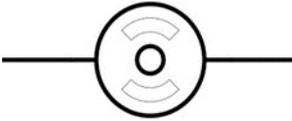
	Switch		Node mcu esp8266
	Micro USB Charger		Vibrator motor
	Lithium ion battery		Ground
	Strap		3D Printing plastic

Table 3.2 Project Materials And Component

### **3.2.3 Data Analysis Method**

**(MOHAMMAD FALIKH MU'TASHIM BIN AZMAN)**

In general, the study or level of need for these facilities has been studied through quantitative methods that we have described about the level of need for such facilities. This is also what has been analysed and studied and has the potential to increase the level of safety for the deaf while carrying out work or practical in a workshop or industry. The study shows the frequency distribution and percentage of respondents by age.

### **3.3 SUMMARY**

This Excuse Me product is a product that is very much needed, especially in situations such as in a workshop or industrial place. This is because it can not only improve safety and make it easier for lecturers or supervisors to interact but also increase the level of safety facilities for the disabled, especially the deaf. In addition, it can increase the level of confidence to this group where they will not feel left out by society with the availability of facilities such as this Excuse Me product.

## **CHAPTER 4**

### **RESULT AND DISCUSSION**

#### **4.1 INTRODUCTION**

**(NORSYAFIQAH)**

This is the study's final chapter, and it will cover the benefits and standards used, as well as research recommendations for unique group communication tools. The experimental design's test results revealed a positive influence on consumers. Furthermore, to determine whether the chosen material is appropriate and effective in reaching the objectives we set, in order for the project to be successful and everyone to respond positively.

#### **4.2 PRELIMINARY RESEARCH FINDING**

**(MUHAMMAD ALIFF BIN HASNAN)**

According to the survey findings and discussion with the supervisor, this communication tool is very useful and has a positive impact on particular groups. Overall, if this Excuse me project is successfully produced and used, all of the study's objectives outlined in Chapter 1 can be met.

No	Categories	Group	
		Frequency	Percent
1	Gender		
	1.1 Man	23	85.2%
	1.2 Women	4	14.8%
2	age		
	2.1 15-24 years	26	96.3%
	2.2 25-34 years	1	3.7%
	2.3 35-44 years	-	-
	2.4 45 years and above	-	-
3	Nation		
	3.1 Malay	23	85.2%
	3.2 China	2	7.4%
	3.3 India	1	3.7%
	3.4 Others	1	3.7%
4	Work		
	4.1 Government	-	-
	4.2 self employment	2	7.4%
	4.3 Swasta	-	-
	4.4 Students	25	96.6%
5	have friends that are deaf		
	5.1 Yes	20	74.1%
	5.2 No	7	25.9%
6	You are a participant of deaf.		
	6.1 Yes	20	74.1%
	6.2 No	7	25.9%

**Figure 4.2 Respondent Background Data**

There were 27 responders in the survey, with 23 men making up 85.2% of the total. 14.8 percent of responders who were women overall (4 people) We might infer from these figures that 20 respondents, or 74.1 percent, have issues with being deaf, and that 96.3 percent of respondents are between the ages of 15 and 24. This demonstrates how important it is for the deaf to use this new technology when conducting workshops and working.

No	Item	Skala			
		1	2	3	4
1	In the event of an emergency, the group's safety while in the workshop is still not guaranteed.	- -	7.4% (2)	59.3% (16)	33.3% (9)
2	It is crucial that this group and the presenters communicate during the workshop.	- -	- -	18.5% (5)	81.5% (22)
3	There are currently no safety amenities availabl for students who are deaf.	- -	3.7% (1)	63% (17)	33.3% (9)
4	When the lecturer is not there while in the workshop, it is difficult to warn or convey	- -	- -	66.7% (18)	33.3% (9)
5	required technological devices to improve safety in the workshop	- -	- -	33.3% (9)	66.7% (18)

**Table 4.3 Respondents' Data Analysis**

Table 4.3 shows the results of the analysis were taken from the respondents through a questionnaire that was made to take the decision for our project. A total of 5 statements were outlined related to the safety factors that were in the workshop for the deaf. Based on the data obtained from table 4.2.1 above, respondents gave answers based on a scale of 1 (strongly disagree), 2 (disagree), 3 (agree) and 4 (strongly agree).

### **Conclusion**

The analysis that has been done allows us to get the conclusion that there are a lot of positive replies. Additionally, customers respond favourably to our items. As a result, this product can be promoted if it is supplied to consumers and produces good results.

### 4.3 RESULT

(MOHAMAD FALIKH MU'TASHIM BIN AZMAN)

(MUHAMMAD ALIFF BIN HASNAN)

Table 4.4 below shows the application testing result on the device. The device is connected to the application installed on the lecturer's or supervisor's mobile phone. OKU 1 and OKU 2 are the devices tested. The data on the application will display "1" when the lecturer or supervisor receives a call from a student or employee. The student or employee device will also display "1" when receiving a call from a lecturer's or supervisor's mobile phone. When no call is made, the number "0" is retained. Same as table 4.5, which shows the vibration testing result of the device. In addition, the lecturer or supervisor will receive a notification as displayed when they were called.

APPLICATION	CALL (1)	CALL (2)	CALL (3)	CALL (4)
OKU 1	0	1	0	1
OKU 2	0	0	1	1
EFECTION	NO VIBRATE	VIBRATE (OKU 1)	VIBRATE (OKU 2)	VIBRATE (OKU 1 and OKU 2)

**Table 4.4 Application Testing Result**

EXCUSE ME	CALL (1)	CALL (2)	CALL (3)
OKU 1	1	0	1
OKU 2	0	1	1
NOTIFICATION VOICE	Excuse Me, you have EMERGENCY call from OKU 1	Excuse Me, you have EMERGENCY call from OKU 2	Excuse Me ,you have EMERGENCY call from OKU 1,2

**Table 4.5 Vibration Testing Result**

As a result of this project, the aid will alert the lecturer or supervisor and student or employee from the student's or employee's gadget, which is positioned at the upper arm, and vice versa. When the switch is turned on, this assistance will work. The employee or student will be alerted by the vibration from the strap's vibration sensor. Additionally, a student or worker can tap the device to alert their lecturer or supervisor when they need to speak with them from their workstation. The buzzer will then buzz, and the LED will light up.



**Figure 4.1 Final Product of The Project**



**Figure 4.2 Application System Response**

#### **4.4 DISCUSSION**

**(MOHAMAD FALIKH MU'TASHIM BIN AZMAN)**

The project's intended outcome is to make it easier for lecturers and deaf students to communicate over great distances while engaging in hands-on activities in the workshop. A link can be established even across great distances with simply a WiFi connection when using the Arduino IDE, MIT APPS, and Blynk Cloud together. The lecturer simply needs to hit the call button on the phone to call the student, and the student only needs to touch the given button on the vibration strap to call the lecturer, making this project simple to use.

The effectiveness of the instrument has been tested on the deaf throughout this procedure, according to the discussions we've had. The test was carried out with consideration for safety, efficacy, and two-way communication between supervisors and deaf person. Hearing and

speech-impaired individuals with disabilities tested this product. Next, we conducted a study in the workshop to see if the deaf could recognise and observe the effects of utilising EXCUSE ME while performing tasks. The usefulness of this technology is also assessed based on its application in the workshop where the deaf are employed.

#### **4.5 SUMMARY**

At the end of this chapter, each experiment performed must be appropriate for the project to succeed well. In addition, the need for Excuse me is to create communication tools for the deaf and dumb. Among its advantages is that it can communicate between the deaf and dumb and lecturers while in the workshop even at a distance.

## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATION**

#### **5.1 INTRODUCTION**

The conclusions drawn from all the experiments conducted and the discussions in the previous chapters served as the foundation for the decisions made for this chapter. In this chapter, related subjects include the study's objectives and its recommendations. Conclusions for this test have also been reached.

#### **5.2 CONCLUSION**

This project supports the needs of the deaf to communicate and facilitates their work. Effective communication between them and the lecturer or supervisor while carrying out their duties is very important to ensure that the information received is correct and accurate and to be able to control time and conditions. This product can also serve as a reminder of how important it is to keep everyone safe, especially the deaf, in case of an emergency in the working area. This is because lives are at risk, making safety a critical concern. In the case of an emergency, this aid aims to reduce and monitor the risk to the deaf while they are in the working area. Stakeholders are encouraged to pay attention to their needs in order to protect human capital from this group.

#### **5.3 RECOMMENDATION**

communication tools is a method used to help the deaf in doing work, especially in the workshop to give information to supervisors when there is an emergency or a problem they face to reduce the number. Here are some things that are suggested to further improve the study that will be done on communication tools to find out the level of effectiveness:

- 1) Recommend using a longer lasting battery. which can last 4 to 6 hours a day
- 2) Suggest replacing the casing design with a smaller one. this is for comfort when doing work in the workshop

#### **5.4 SUMMARY**

It is feasible to draw the conclusion that "EXCUSE ME" has succeeded in assisting the deaf and dumb in communicating with supervisors in the workshop based on the results of the tests conducted on communication tools for the deaf. Additionally, expand the industry's facilities for the deaf.

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## APPENDIX A

### GANTT CHART

SESSION : 2:2021/2022

DEPARTMENT : MECHANICAL ENGINEERING

CODE/COURSE : DJJ40182 PROJECT 1

WEEK/ PROJECT ACTIVITY	STATUS	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14
	Project briefing. Brainstorming.														
Introduction of the project - Define Problem Statement. - Identify project objectives - Project scopes and limitations - Identify project title															
Organize and write the project proposal															
Literature Review - Include at least 5 cases - Citation from references															
Project Methodology - Define specific research and method used - Able to specify the project scope and the significance to mankind - Design and develop product															
Resources (materials, tools, software, hardware, etc) identification and selection															

Legend:

	Planning
	Actual

## APPENDIX B

SESSION : 1:2022/2023

DEPARTMENT : MECHANICAL ENGINEERING

CODE/COURSE : DJJ50193 PROJECT 2

WEEK/ PROJECT ACTIVITY	STATUS	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
Project briefing, iSOLMS briefing																
design thinking / Arduino workshop																
Technical writing workshop																
Project Planning																
project requirement																
project plan																
project scope and limitation																
project methodology																
Project Development																
project development details																
project techniques and tools																
validity and reliability measurement																
project results and analysis																
Project report writing																
Technical Paper review by supervisor																
Project Inventory Form submission																



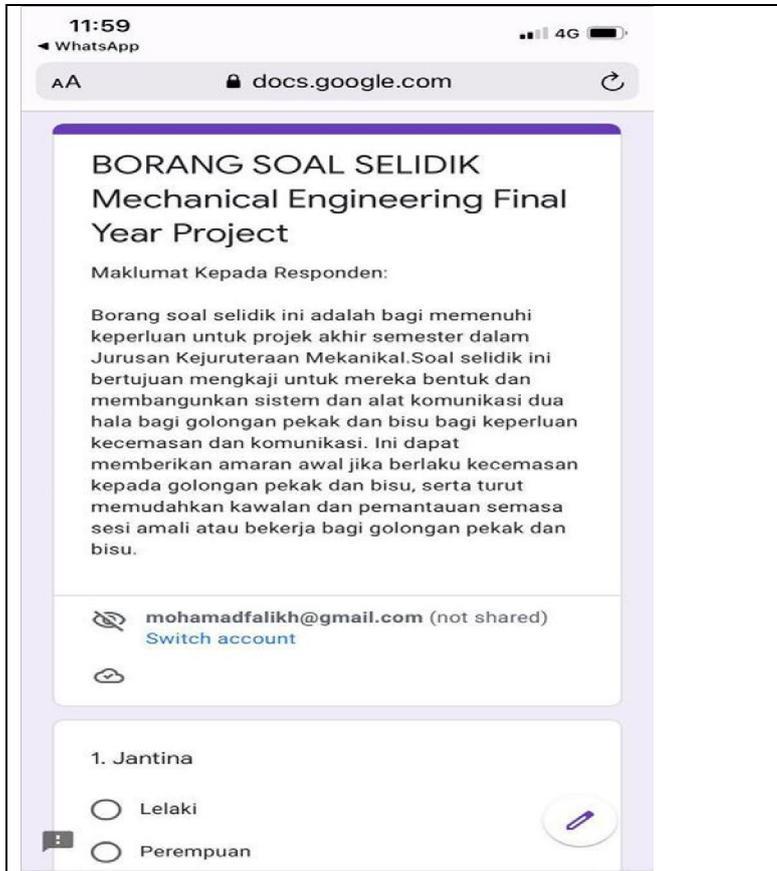
## APPENDIX C

### PROJECT COST ESTIMATES

NO		COST (RM)
1	Material -Mini Disc Vibrating Motor 1027 -315Mhz 433Mhz RF Wireless Transmitter Module and Receiver Kit 5V DC 433MHZ Wireless For Arduino Raspberry Pi /ARM/MCU WL Diy Kit -10pcs 5mm Led Mixed Kit Color red green yellow blue white light-emitting diode - A000005 Evaluation Board, MCU 8-Bit, Arduino Nano, AVR, ATmega328 -759 Premium Male/Male Jumper Wires, 40 x 3" (75mm) - 20pcs/lot 7X7mm 7*7mm 7*7 6Pin Push Tactile Switch Self lock /Off button Latching switch Wholesale Electronic - DC3-24V SFM-20B Active Piezoelectric Buzzer Long Continous Beep Tone Buzzer -20/22mm Nato Strap Stainless Steel Buckle for Men Women - Soldering iron with wire	231.08
2	Equipment - Cutter - Hot glue gun	10.00
3	Workers' wages (3 People)	30.00
4	Delivery Item	15.00
		<b>TOTAL: RM256.08</b>

## APPENDIX D

### QUESTIONARE



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### BORANG SOAL SELIDIK Mechanical Engineering Final Year Project

Maklumat Kepada Responden:

Borang soal selidik ini adalah bagi memenuhi keperluan untuk projek akhir semester dalam Jurusan Kejuruteraan Mekanikal. Soal selidik ini bertujuan mengkaji untuk mereka bentuk dan membangunkan sistem dan alat komunikasi dua hala bagi golongan pekak dan bisu bagi keperluan kecemasan dan komunikasi. Ini dapat memberikan amaran awal jika berlaku kecemasan kepada golongan pekak dan bisu, serta turut memudahkan kawalan dan pemantauan semasa sesi amali atau bekerja bagi golongan pekak dan bisu.

 mohamadfalikh@gmail.com (not shared)  
[Switch account](#)



1. Jantina

Lelaki

Perempuan



11:59  
WhatsApp docs.google.com

1. Jantina

Lelaki

Perempuan

2. Umur

15-24 tahun

25-34 tahun

35-44 tahun

45 tahun ke atas

3. Bangsa

Melayu

Cina

11:59  
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4. Pekerjaan

Kerajaan

Sendiri

Swasta

Pelajar

5. Adakah anda mempunyai kenalan atau pengalaman terhadap golongan pekak dan bisu?.

Ya

Tidak

6. Adakah anda termasuk dalam golongan pekak dan bisu?.

Ya

Tidak

11:59  
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**PERNYATAAN**  
ARAHAN:

Pilih salah satu pilihan dibawah ini terhadap pernyataan di bawah ini yang paling sesuai dengan penilaian anda. Skala penilaian sebagai berikut:

- Sangat tidak setuju
- Tidak setuju
- Setuju
- Sangat setuju

1. Keselamatan golongan pekak dan bisu semasa berada di bengkel atau industri tidak terjamin terutama jika berlaku kecemasan.

Sangat tidak setuju

Tidak Setuju

Setuju

Sangat setuju

11:59  
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2. Komunikasi di antara pensyarah / penyelia dengan golongan pekak dan bisu adalah amat penting semasa menjalani amali / bengkel.

Sangat tidak setuju

Tidak setuju

Setuju

Sangat setuju

3. Fasiliti keselamatan bagi pelajar pekak dan bisu di kebanyakan industri dan bengkel masih belum disediakan.

Sangat tidak setuju

Tidak setuju

Setuju

Sangat setuju

11:59  
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4. Sukar untuk berkomunikasi / memberi amaran kecemasan jika keberadaan pensyarah / penyelia jauh dari golongan ini semasa melaksanakan amali atau kerja.

Sangat tidak setuju

Tidak setuju

Setuju

Sangat setuju

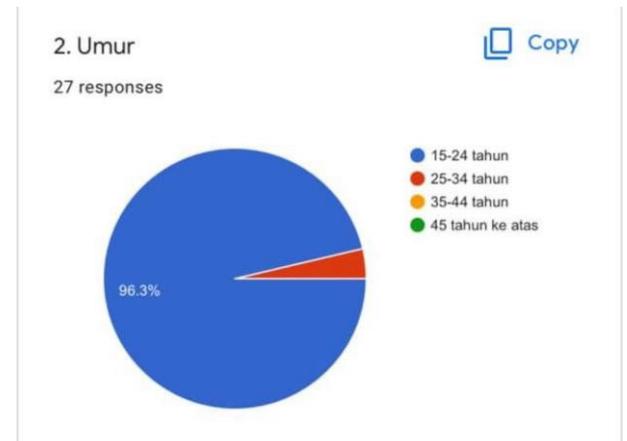
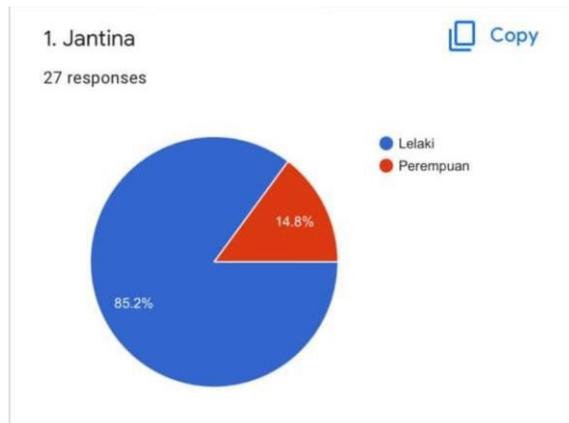
5. Memerlukan satu alat /teknologi untuk meningkatkan tahap keselamatan dan memudahkan pensyarah /penyelia untuk berkomunikasi dengan golongan pekak dan bisu semasa di bengkel/industry

Sangat tidak setuju

Tidak setuju

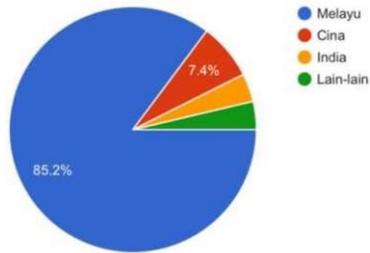
Setuju

Sangat setuju



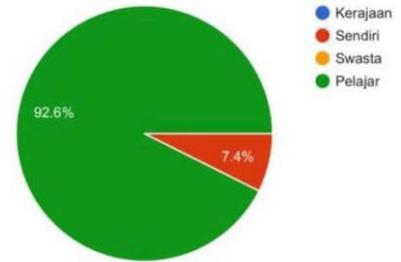
### 3. Bangsa

27 responses



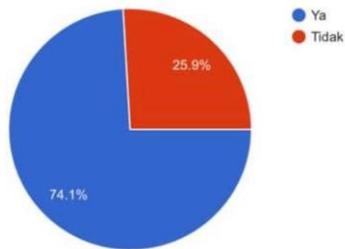
### 4. Pekerjaan

27 responses



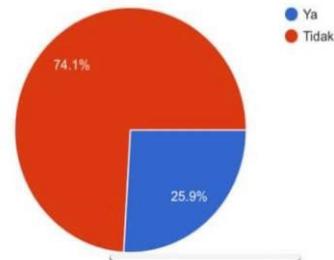
5. Adakah anda mempunyai kenalan atau pengalaman terhadap golongan pekak dan bisu?.

27 responses



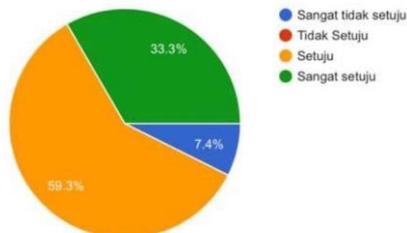
6. Adakah anda termasuk dalam golongan pekak dan bisu?.

27 responses



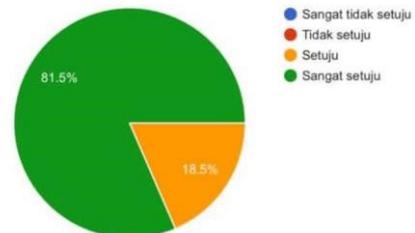
1. Keselamatan golongan pekak dan bisu semasa berada di bengkel atau industri tidak terjamin terutama jika berlaku kecemasan.

27 responses



2. Komunikasi di antara pensyarah / penyelia dengan golongan pekak dan bisu adalah amat penting semasa menjalani amali / bengkel.

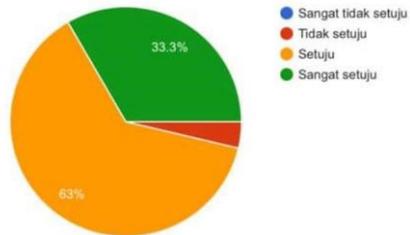
27 responses



3. Fasiliti keselamatan bagi pelajar pekak dan bisu di kebanyakan industri dan bengkel masih belum disediakan.



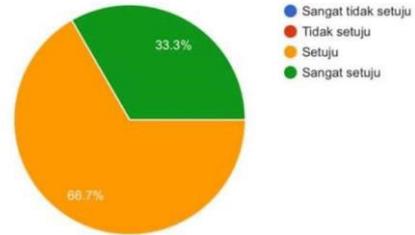
27 responses



4. Sukar untuk berkomunikasi / memberi amaran kecemasan jika keberadaan pensyarah / penyelia jauh dari golongan ini semasa melaksanakan amali atau kerja.



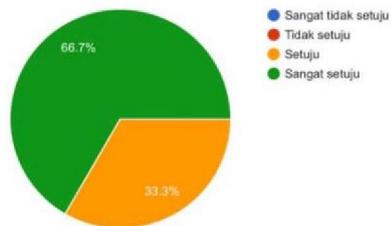
27 responses



5. Memerlukan satu alat /teknologi untuk meningkatkan tahap keselamatan dan memudahkan pensyarah /penyelia untuk berkomunikasi dengan golongan pekak dan bisu semasa di bengkel/industry



27 responses



## APPENDIX E

### PLAGIARISM CHECK BY TURNITIN

# EXCUSE ME

*by* isnuraini kassim

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**Submission date:** 22-Dec-2022 09:54AM (UTC+0800)

**Submission ID:** 1985698476

**File name:** EXCUSE\_ME\_report.pdf (2.71M)

**Word count:** 9577

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# EXCUSE ME

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