INDUSTRIAL TRAINING REPORT CHE353

FACULTY OF CHEMICAL ENGINEERING

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PROGRAMME	DIPLOMA IN CHEMICAL ENGINERRING
ID	2018270066
LI DURATION	22/3/2021 – 30/7/2021 (17 WEEKS)
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1. INTRODUCTION

1.1. Acknowledge

First and foremost, I would like to thank Bechem Technologies for giving me the opportunity to undergo my industrial training. The internship opportunity I had with Bechem Technologies was a great chance for my learning and professional development. I am also grateful for having the chance to meet so many wonderful people and professionals who led me throughout this internship period.

I would like to express a special gratitude to all the staffs from Bechem Technologies who despite being busy with their duties, willingly spent their time out to guide, giving ideas for my project, give necessary advice and encouragement to me during my training. My supervisor also taught me on working ethics in aspect of punctuality and disciplinary.

I would also like to extend my appreciation to all engineers, staffs, technicians, and trainees working at Bechem Technologies for their kindness helping and supporting me through the entire industrial training program in Bechem Technologies. I would also like to thank IR. DR. BEH CHIN LAI the CEO of Bechem Technologies who continue guiding us and understanding all employee situation during the mco period.

1.2. Introduction to Industrial Training CHE353

Industrial Training CHE353 is the final course subject in Diploma of Chemical Engineering at Universiti Teknologi MARA (UiTM). This industrial training is compulsory for Semester 6 students, to complete their diploma studies. Before stepping into the real working life, students are required to seek and apply for an internship at any company that is related to the chemical engineering field. They are also required to submit important documents upon their application.

The objective of this course program is to give students exposure and opportunity for them to embark in the real-life working experience. This course is also beneficial for them as they get to expand their knowledge, learn more on the current chemical industries and apply the theories they have learned during their diploma into real-world scenarios.

Students are required to undergo this industrial training program for a minimum of 17 weeks to fulfil a total of 7 credit hours. The 17 weeks' duration of this industrial training is compulsory as it is to fulfil the requirements by the Board of Engineers Malaysia (BEM) for the Engineering Technology Accreditation Council (ETAC) for undergraduate students.

2.1.2 History of the company Bechem Technologies Sdn. Bhd.

Bechem Technologies Sdn Bhd., a provider of environmental and industrial engineering services is dedicated to meeting the needs of various industries in the most efficient and practical manner possible. Our high-quality, environmentally friendly products, together with our outstanding service, will be your best option for satisfying your strict requirements while remaining cost-effective. They are confident and committed to providing quality products and finest services to the customers in this region, as our dedicated crew has more than 10 years of industry experience in the sector. Bechem also have a great maintenance crew to service and troubleshoot issues to satisfy our consumers. They also offer a variety of industry-related products to our customers. bechem technologies was first established from March 2005 and has been operating to date. This factory was opened by the father of the current CEO of this company, IR DR BEH CHIN LAI. In the name Bechem there is a separate meaning for each alphabet.

Better Water Treatment & Degreasing Solution Provider

Experience in Industrial filtration & Environmental works

Consultation FREE for Industries Problems

Handling with FULL Responsibility

Efficient in Delivery Works

Master's in water & Environmental Engineering

Bechem also have a solid maintenance crew to service and troubleshoot issues to satisfy our clients. They also offer a wide range of relevant industry items and consumables that are both high-quality and cost-effective to our customers. The vision and mission for Bechem Technologies is "to be recognized as world-class organization of industrial & environmental excellence". For the mission is "to be the leader and customer-driven service & products provider that will contribute to the industrial, environmental as well as human's need & enhancement".

Water treatment and services

Bechem specialize in design and build turkey system, offer a broad selection of chemicals, equipment and system targeted for the treatment of raw water, wastewater, and process water e.g., Boilers, cooling towers, etc. All our products are formulated and make under strict supervision and control with technical backup from our specialist consultant.

RAW WATER AND ULTRA PURE WATER SYSTEM

- Iron Removal System
- Ion Exchange System
- Media Filtration System
- Membrane System

Figure 1 water system

WASTE & RECYCLE WATER SYSTEM

Bechem technologies has a lot of waste and recycle water system, among them are

- Chemical Treatment System
- Non-chemical Treatment System
- Biological Treatment System

Project Engineering & Fabrication

Bechem also provide designs and installation of all kinds of industrial process engineering and fabrication including steel works, piping system, tank fabrication to support the total industrial needs. (FRP, PE, PVC, PP, HDPE, Carbon Steel, Stainless Steel, etc).

Figure 4 Tank

Service Maintenance

Bechem also have a solid maintenance crew to service and troubleshoot issues to satisfy our clients.

Figure 5 maintenance crew to service

Wastewater Analyze & D.O.E Submission

Bechem technologies will test the wastewater that has become clear water because of the process that takes place at the client's factory. this aims to ensure that the wastewater treatment process operates properly and follows the correct standard operation procedure.

Figure 6 Jar test equipment

Industrial Degreasing Chemicals & Machine

Bechem Industrial Cleaning products which include the cleaning chemicals and system which developed with new technology as an effective cleaner to meet varies industry metal cleaning requirement as well as best replacement for TCE (Tri-Chloro Ethylene), PCE (PerChloro Ethylene) and MC (Methylene Chloride) which is toxic and harmful to human health and environmental.

Industrial Cleaning products are:
Hydrocarbon cleaner / solvent and machine, Aqueous Cleaner and machine, IPA (Isopropyl Alcohol) cleaner, Solvent Recycling / Recovery system

Figure 7 Cleaning machines

Filter Cartridge

Figure 8 Cartridges

BCT-P Series PP Pleated Filter Cartridge

- Uses the latest gradient density micro fibre media technology
- A special combination of polypropylene media with variation in the fibre diameter
- All components used in the manufacturing process are biologically safe, chemically inert and meet GMP standard and other internationally quality requirements.
- Polypropylene offers an extremely boroad chemical compatibility making it suitable for many applications.

Figure 9 Cartridges

BCT-M Series High Performance Melt Blown Cartridges

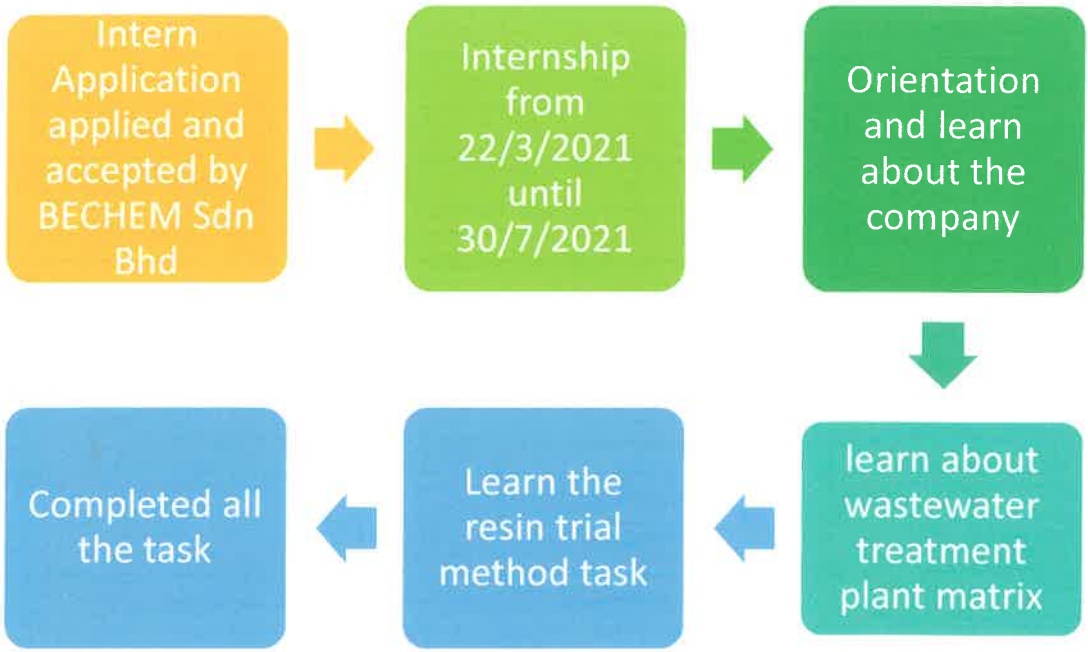
- The 100% polypropylene construction provides excellent chemical resistance to bases, acids, salts and many organic solvents in a broad range of applications.
- All components use FDA listed materials of construction assuring that they are safe for food and beverage contact.
- Continuously graded pore construction enhances contaminant holding capacity resulting in improved filtration performance.
- Optional high strength polypropylene center core allows for optimization of filtration medium and enhances the cartridge's mechanical properties.

Filter Bag & Housing

Bag Filter

Bag Filter Housing

Process flow internship



2.3 BRIEF DAILY/WEEKLY ACTIVITY

Mrs, Lilian gives me a task to do a manual for the filter press equipment that would be sent to the matrix factory. I need to make improvements from the old manual. This is because the press filter that needs to be sent to the matrix is a new machine and its function is auto. In the matrix now the filter press is a manual way.

I need to do a report for the description in running the press filter, but I need to do a draft to be sent to the supervisor before submitting to my supervisor. I need to redo the manual press filter as there is some incomplete data and needs to be corrected. Then submit to my supervisor. Mr. Syahrani asked for help from me and imran to paint the writing of the filter press on the filter press machine. Before that we paste the writing filter press on the machine.

Figure 10 Filter press

The figure on the left is a new press filter and how to use it is auto. The machine is still under improvement for use in the matrix. The number of plates is more than the old press filter. The figure on the right is the filter press that is being used in the matrix, how to use it is manual and it takes a lot of time to run the wastewater treatment process. Because of that, Matrix Sdn Bhd wants to use a new press filter. The technician manager taught me to control the filter press. I was taught from start to finish. I need to know how long the filter press runs with the same pressure. this is because to Inow the machine from working properly.

Next activity, I entered the office lab to make a jar test for the Atlas project. Did a jar test on using same type of flocculant (Befloc-2A) but different coagulant type and dosage where we use RM10-8008M (USA product) and local products which is Becol-280A and Becol-201C. Then, I did digestion and COD test on Atlas's sample project to perform a testing using distillation method to simulate the vacuum evaporator on Atlas Project. the experiment to get the desired pH value, and for cod test to get the percentage cod removal of the sample.

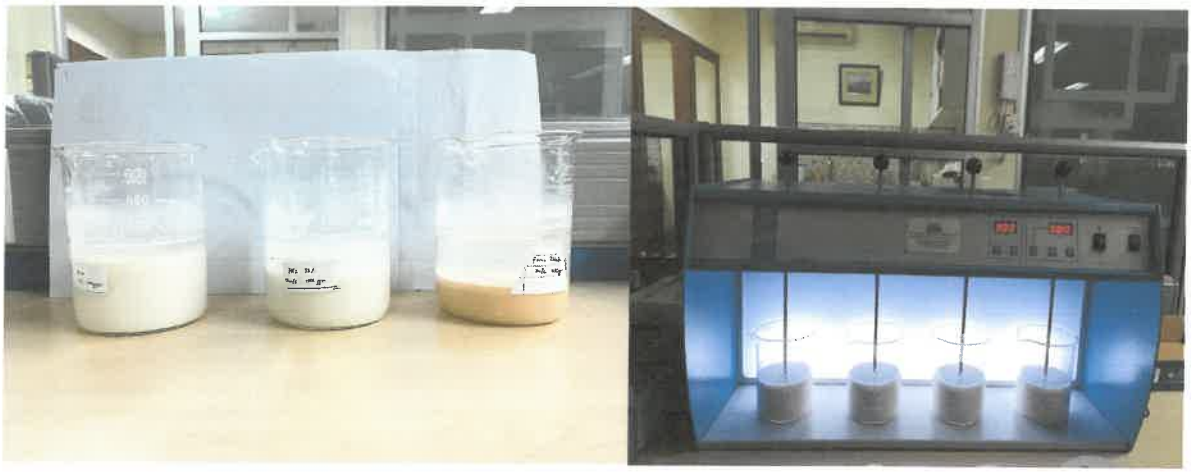


Figure 11 Jar Test

The next day, did a jar test using coagulant of Becol-201C (PAC) but use different dosage, which is 900ppm, 600ppm, 500ppm, 400ppm and 300ppm. Decided to use 400ppm concentration of Becol-201C. Had a meeting with Ir. Dr. Beh and Ms. Lillian regarding IECS report of Atlas Project. Did a COD test on Atlas's mixture (inital and final) and final sample of 400ppm jar test. Then, did 3 jar tests using 400ppm of Becol-201C but with different value of pH adjustment to meet the best final pH value. Took the final sample and compile all the results.

I also make piping for Kohoku factories that want to use my company's services. Before this Kohoku used auto multiport valve selector. Now they want to use manual multiport valve selector on multimedia filter tank and activated carbon filter tank. They want to change because they want to save on their factory budget.

Figure 12 Piping

2.4 DESCRIPTION OF TASK ASSIGNED (MINI PROJECT)

MATRIX WASTEWATER TREATMENT PLANT

The specific task for this task given was when I was with a senior technician to Teluk Panglima Garang to visit Matrix flavors & fragrances sdn bhd. My intern and I need to know the process done in the plant with respect to wastewater treatment supplied by my company. I need to understand because this wastewater treatment there are new things in my life. the plant at matrix is a temporary place. This is because when initially operating at the matrix plant they have no place for wastewater treatment. The process was a bit elusive when I first came and saw the way wastewater was treated. My supervisor teaches me to know more in depth about the process and position of all equipment. Also, all things like maintenance or improvements will be done at the place.

Figure 13 Temporary plant

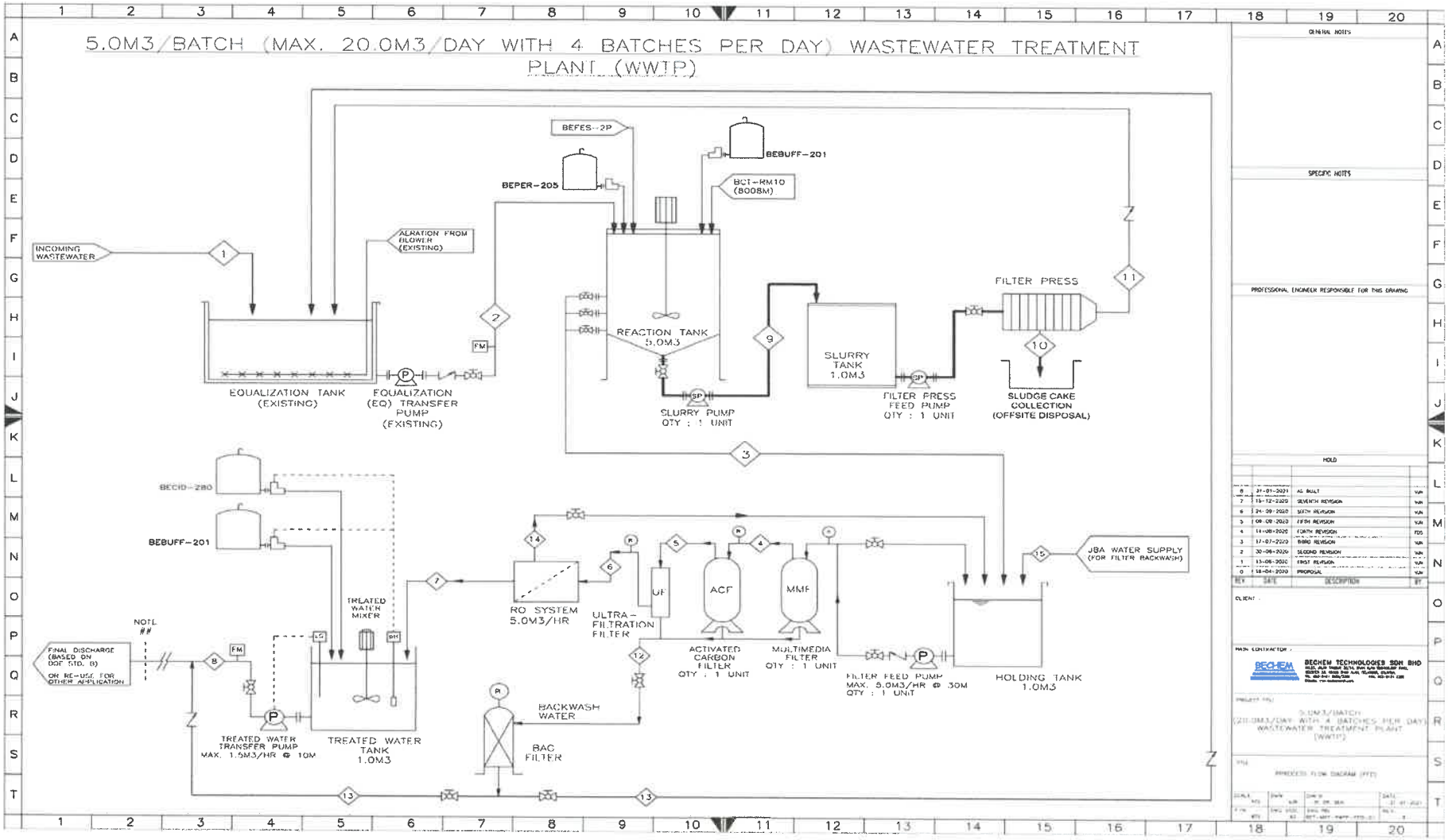


Figure 14 Process flow diagram

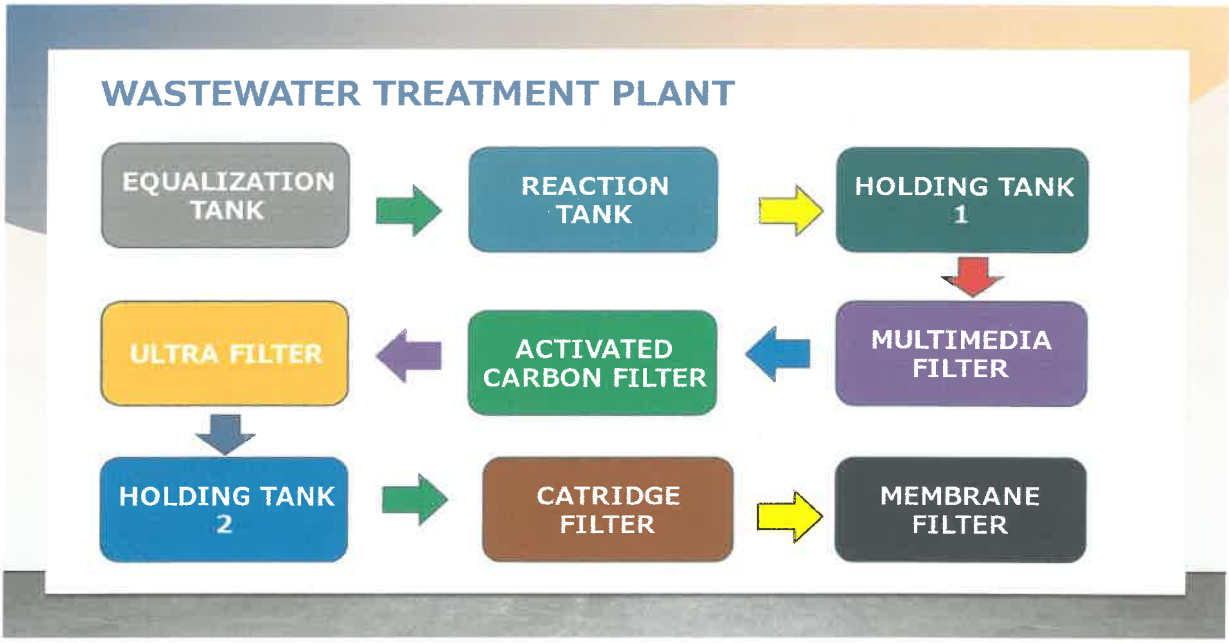


Figure 15 Block flow diagram

In the figure 12 is the process flow diagram wastewater treatment plant in the matrix. I understand the process carried out when the supervisor explains to me. Also, when I saw the process going on which was carried out by the operator at the plant. In the figure 13 there is a block flow diagram made by the internship student to better understand this wastewater treatment process

So, the wastewater treatment process is valid when the wastewater will come from the Equalization tank and will be filled in the reaction tank as much as 5000 liters. After that the wastewater will be processed by including various types of chemicals such as befes, beper and bebuff. This is a chemical substance sold by bechem to the matrix. Process in the reaction tank takes 3 hours before the water flows into the holding tank, Multimedia filter tank and Activated carbon filter. In each filter, the water will be filtered to get good water results before the water process will be seen in the ph correction tank. They have many filters because each filter has a different type of process. This process also has a backwash process when all the treatment process done by batch.

I also do things like technical and maintenance. I washed and serviced the activated carbon filter tank. The carbon in the tank has expired and also suffered damage that makes the wastewater treatment process does not get good treated water. The service work to remove the old carbon in the tank is quite difficult and has to do with the concept of gravity. A total of 8 carbon sacks were filled after successfully removing the old carbon.

Figure 16 Activated carbon filter tank (blue)

I and others internship need to do a COD test on wastewater treatment processed at Matrix Sdn Bhd. We took two samples and tested it on office lab. Firstly, we will put the treated water liquid into the vile and then heat the vile in the dkt200 device. We had to wait for the vile to be heated for 30 minutes to a temperature of 130 Degrees Celsius. After being heated, we must wait for the vile to cool and will be tested on photometers 12 plus. The result for the cod test did not give a good result so we went back to matrix sdn bhd to do the cod test again. After adjusting the new membrane for the Reverse Osmosis (RO). We were able to achieve a COD value of less than 100 mg/ after service and repair the equipment. 3 COD tests were performed on the next week. The COD value was dropped and remain on value of 100 mg/l.

Figure 17 COD test equipment

I was given a new task to do a slide presentation for standard operating procedure wastewater treatment for matrix sdn bhd. This is because the operator in the matrix is seen not following the wastewater treatment standard operating procedure (sop). This caused the process to not run well and the treated water did not reach the set standards. Then, we observed the way the operator performed the process by following the sop or not. Then, new adjustment for SOP in doing wastewater treatment method for Matrix to provide better and reliable results was discussed. I follow Mr. Syamel and Mr. Harinesh went to matrix for a training program with the operator there. The slide was present by IR DR, Beh Chin Lai about the standard operating procedure wastewater treatment plant.

Figure 18 The operator in training program

3.0 CONCLUSION

During the student's 17 weeks of industrial training, the students were able to gain fresh information and valuable experience. Student can complete practical training at Bechem Technologies Sdn. Bhd, a good and well-maintained company, suitable for interns to start learning the work culture. The students managed to acquire extensive knowledge about the glove making process and had the opportunity to experience practical work firsthand, not just theoretically. The students also gained a lot of knowledge about safety precautions and hazards to make sure they are taken seriously in any task operation.

The lives of students and employees are completely different. The career transition from student to worker has affected many changes in life. This is because the work culture cannot be studied theoretically. It can only be understood through practice and real-time experience. The internship program helps students understand professional ethics, work culture, and adapt to a new environment. It also contributes to personal growth, including building confidence, strengthening basic skills, and improving character. In summary, the quality and quantity of experience in the host country, especially for interns.