

# Project Oriented Problem Based Learning (POPBL)

What is a Problem Based Project?  
Introduction

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## Today's Programme

- Overview of PBL and POPBL
- How to design a project – Case Study

Please think of one of the things that you are good at, write three words in the post-it describing how you learned it well

## Backgrounds of PBL

- Teach me...and I will forget ?
- *Tell me and I will forget*
- *Show me and I will remember*
- *Involve me and I will understand*
- *Step back and I will act*

## Carl Rogers on teaching at Harvard

- It seems to me that anything that can be taught to another is relatively inconsequential, and has little or no significant influence on behavior.

- I have come to feel that the only learning which significantly influences behavior is self-discovered, self-appropriated learning.



- Learning is the process of acquiring new potential behavior.
- It is an effective strategy to make the learner responsible for their own learning.
- This explains the success of methods like PBL and POPBL.

# What kinds of skills are expected for the future?

## Top 10 skills

### in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

### in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity

## PBL :student-centered Learning and learning model

- Many approaches of PBL- 7 stages, 5 ladders.
- Universal element:

A learning method based on the principle of using problems as a starting point for the acquisition and integration of new knowledge - *H.S. Barrows 1980*

## PBL Aalborg Model - practice

### Nature

- Problems – question – wondering within a frame
- a project each semester (1. year)
- each group has a group room
- group size of 6-8 students
- each group has at least one Facilitator
- self selected group and projects within themes and disciplines
- group presentation

### Visual



## What is a facilitator and the dos?

- A person who through facilitating questions encourages your learning process.
- A person who points out the potentials in your work.
- A person who gives loyal and constructive critic of your work.
- A person who at the project exam is one of the examiners.

## The don'ts of a facilitator

- Do not lecture.
- Do not tell students what to do.
- Do not decide the content of your project
- Do not be a member of your project group
- Do not be an inexhaustible resource – walking dictionary.

## PROJECT ORIENTED PBL

Consists of 3 elements

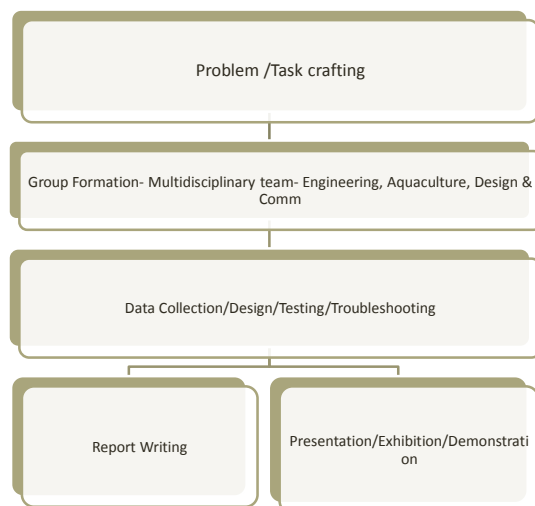
- Problem
- Project
- Teamwork

# Case Study- Entrepreneurship

## Objective

To improve revenue of FANZ Aquaculture farm through production and promotion of selected agricultural aqua species.

## Process



Course	Entrepreneurship
Overall aim	To improve revenue of FANZ Aquaculture farm through production and promotion of selected agricultural aqua species.
Learning outcomes	<ul style="list-style-type: none"><li>• To identify market's needs in terms of freshwater species.</li><li>• To determine factors that boost culture's production.</li><li>• To design an automation system to facilitate culture's process.</li><li>• To develop promotion strategies.</li></ul>
Duration	<ul style="list-style-type: none"><li>• One semester (Third Year students)</li></ul>
A problem	FANZ Aquaculture Farm, specializing in freshwater species, has been operated for 15 years. However, for the past years, culture's performance of the fish has been stagnant due to unknown factors. Hence, production is slowing down and affecting the marketing aspects.





# ASSESSMENT PHASE

Presentation/poster/ demonstration	30%
Final Report	30%
Progress presentation (2)	20%
Log Book (Individual)	10%
Peer Review – Individual & Group	10%

# Gantt Chart

Week/Activities	1-2	3-4	5-6	7-8	9-10	11-12	13-14
Project Briefing							
Site visit-Data Collection							
Analysis							
Develop strategies/design prototypes							
Progress presentation/Peer Reviews							
Project Development/							
Final Report							
Presentation/Poster/Demonstration							
Final Report Submission							

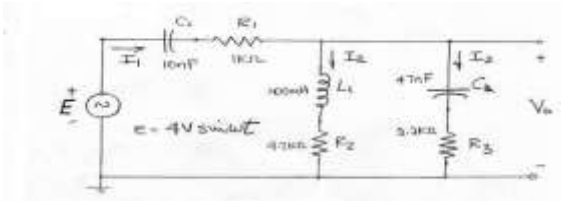
# Planning / Activity Chart

Week	Activity	Involvement	Outcomes	Assessment
1-2	Project Meeting/ Site Visit/Data Collection	1- Present Problem 3- conduct site visit and survey	To identify market trends in terms of freshwater species	
3-4	Analyze & Project Planning	3- analyze data and plan projects	To determine factors that boost culture's production	Progress presentation/Peer Review
4-6	Develop strategies/design prototypes	3- develop strategies or prototypes to overcome problems	To develop promotion strategies.  To design an automation system to facilitate culture's process	

5-12	Project development: I. Designing automation system II. Developing strategies for culture's production III. Developing strategies for promotional and marketing purposes	3- develop design and strategies catering for multidisciplinary team.	To develop promotion strategies.  To design an automation system to facilitate culture's process.	Progress Presentation/ Peer Review
13-14	Final Project Assessment	3- evaluates the input in accordance to the predetermined problem by students. 3- present orally and in written medium.		Presentation/poster/demonstration Final Report Log Book

# ELECTRICAL TECHNOLOGY- Problem

- Welcome to the PETRONAS Engineer group. Congratulations because now you are hired as an electronic engineer. You are willing to work in team with your senior engineers. This is the first task that you need to do regarding the circuit diagram given.



- This circuit will be used in our communication parts. You are required to design using this circuit diagram and apply it in communication parts such as filter, ringing circuit and others. Good luck guys.

# Peer-Evaluation rubric

Mini Project / Peer Evaluation Form :: ELECTRICAL ENGINEERING (Semester 1)

**PEER GROUP EVALUATION** (To be submitted to instructor by group)

Name and Project Title: \_\_\_\_\_

Note: Please refer a rubric provided at the back of the sheet before proceed to give mark.

**A. Names of your group members.** (The letter corresponds to the student's name.)

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

**B. Performance in the Learning Community**  
Rate each member (a, b, c, d, e) with a 5-point Likert scale (a=high, e=lowest)

1. Contributions	a	b	c	d	e
2. Time management	a	b	c	d	e
3. Attitude	a	b	c	d	e
4. Working with others / Cooperation	a	b	c	d	e
5. If given the opportunity, would you want to work with this team member again? (Yes = 4 points; Maybe = 3 points; No = 0 points)	a	b	c	d	e
<b>Total Marks (Full marks = 20)</b>					

Don't base your evaluations on friendship or personality conflicts. Your input can be a valuable indicator to help assess contributions in a fair manner.


# Peer-Evaluation rubric

Mini Project : Peer Evaluation Form - BPPCBUS TECHNICAL PHYSICS (Confidential)

## PEER EVALUATION RUBRIC

CATEGORY	4 (excellent)	3 (good)	2 (satisfactory)	1 (poor)
Contributions	Regularly provides useful ideas when participating in the group and in classroom discussion. A definite leader when consultation is free of effort.	Usually provides useful ideas when participating in the group and in classroom discussion. A strong group member who does his/her part.	Sometimes provides useful ideas when participating in the group and in classroom discussion. A satisfactory group member who does what is required.	Rarely provides useful ideas when participating in the group and in classroom discussion. May refuse to participate.
Time management	Regularly uses time well throughout the project to organize things and does not miss things due to time. Does not have to adjust deadlines or work responsibilities because of this person's procrastination.	Usually uses time well throughout the project, but may have procrastinated on one thing. Does not have to adjust deadlines or work responsibilities because of this person's procrastination.	Tends to procrastinate, but always gets things done by the deadline. Does not have to adjust deadlines or work responsibilities because of this person's procrastination.	Rarely gets things done by the deadline. And group has to adjust deadlines or work responsibilities because of this person's procrastination.
Attitude	Often is positively critical of the project or the work of others. Always has a positive attitude about the task(s).	Rarely is positively critical of the project or the work of others. Often has a positive attitude about the task(s).	Occasionally is positively critical of the project or the work of others. Usually has a positive attitude about the task(s).	Often is negatively critical of the project or the work of others. Often has a negative attitude about the task(s).
Working with Others	Almost always helps, shares with, and supports the efforts of others. Does not have to work with anyone.	Usually helps, shares with, and supports the efforts of others. Does not have to work with anyone.	Often helps, shares with, and supports the efforts of others. But sometimes is not a good team member.	Rarely helps, shares with, and supports the efforts of others. Often is not a good team player.

# Project -Based Lab Assessment



FAKULTI TEKNOLOGI KEJURUTERAAN ELEKTRIK DAN ELEKTRONIK  
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**PROJECT-BASED LAB ASSESSMENT**

Code/Subject: \_\_\_\_\_  
File of Experiment: \_\_\_\_\_  
Course/Section: \_\_\_\_\_  
Date: \_\_\_\_\_

	NAME	MATRIX NO.	MARKS
1			
2			
3			
4			
5			

1

Item	Description	Very Weak 1	Weak 2	Medium 3	Good 4	Excellent 5	Weight	Score
Procedures	Ability to observe and use equipment	Unable to identify and use equipment	Identify all items but unable to use equipment	Identify materials and use equipment	Use equipment safely using equipment but not consistently	Identify use consistently with the equipment	20	
Work Process	Ability to construct and understanding of experiment	Work process is missing or unclear	Major work process missing	Minor work process missing	Most of the work process are followed correctly	Work process are followed correctly and fully	20	
	Ability to share data	All data are missing or incorrect	Most data are missing or incorrect	Most data are correctly shared	All data are shared but some data are missing	All data are correctly shared	20	
Outcomes	Completion of project	Project not completed	Major parts of the project are incomplete	Minor parts of the project are incomplete	Project is fully completed but not fully functioning	Project is fully completed and fully functioning	20	
Discussions	Ability to present lab and safety regulations	Major errors in content, in discussion and safety regulations	Minor errors in content, in discussion and safety regulations	Minor errors in content, in discussion and safety regulations	Project is fully completed but not fully functioning	Project is fully completed and fully functioning	10	
TOTAL								

# Rubric- Report Assessment

No.	Element	Service (6-8)	Apprentice (4-6)	Proficient (7-9)	Excellent student (10)	Weighted	Score
1.	Introduction	No introduction	Vague notes of a report introduction, poorly integrated throughout the paper.	There is a brief introduction throughout most of the paper.	Clearly presents a report introduction throughout the paper.	1.0	
2.	Overall organization	No overall organization	There is a format of report sections, although some of the report sections make no real sense by the subject.	Clear overall organization, includes the main report sections.	Well presented and well thought out, includes all report sections, includes all main ideas, includes all report sections.	1.5	
3.	Content	Content is not relevant	Content is relevant and useful, but not particularly developed or supported, some evidence, but mostly of a generalized nature.	Well presented and useful, some use detailed, clear support and evidence and details, clearly specific.	Excellent, well presented and useful, some use detailed, clear support and evidence and details, clearly specific.	1.5	
4.	Diagrams and Illustrations	There are no diagrams, illustrations, charts, etc.	Diagrams, illustrations, charts, etc. are used, but not necessarily support the presentation.	Diagrams, illustrations, charts, etc. are used and support the presentation.	Diagrams, illustrations, charts, etc. are used and support the presentation.	1.0	
5.	Research	The paper does not use adequate research or if it does, the research is not integrated well. There are not cited correctly.	Some research is used, but not necessarily support the paper's claims. There may be a few errors in citations.	Research is used and supports the paper's claims. There may be a few errors in citations, but overall it is well supported.	Research is used and supports the paper's claims. There may be a few errors in citations, but overall it is well supported.	1.0	
6.	Conclusion & Recommendation	Conclusion is missing	There is a conclusion, but it is not necessarily support the paper's claims. There may be a few errors in citations.	A clear, concise conclusion, includes all main ideas, includes all report sections.	Excellent conclusion, includes all main ideas, includes all report sections.	1.0	
7.	Format	Shoddy formatting	Formatting is poor (e.g., margins, spacing, etc.)	Acceptable formatting, but still needs work.	Appropriate formatting, includes all main ideas, includes all report sections.	1.0	

# Report-Assessment

## PLO Affective Domain

PLO	Description	Keyword	Significant related elements
6	Ability to function effectively as individuals, and as members or leaders in diverse technical teams	Teamwork	All
7	Ability to communicate with the engineering community and society at large	Communication skills	Verbal : 4, 6, 9 Non-verbal : 1, 2, 3, 5, 7
8	Ability to demonstrate an awareness of and consideration for societal health, safety and legal/cultural issues and their consequent responsibilities	Society and environment	7
9	Ability to demonstrate an understanding of professional ethics, responsibilities and norms of engineering technology practices.	Ethics and safety	7
10	Ability to demonstrate awareness to management, business practices and entrepreneurship	Entrepreneurship and management	7
11	Ability to demonstrate an understanding of engineering practices taking into account the need for sustainable development	Sustainable Development	7
12	Ability to recognize the need for professional development and to engage in independent and lifelong learning	Lifelong learning	1, 2, 3, 5, 6, 8, 9

## Group Task

- Work in Group of 6.
- Choose 1 course and discuss the planning for a POPBL approach for **3 weeks**.
- Design a problem for the course.
- Share with the class afterward.