

# Problem-Based Learning for Developing Holistic Future-Ready Graduates

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# Outline

- **Background: The status quo...**
- Problem-Based Learning: Why and What
- The problem in PBL
- Scaffolding for learning in PBL: Cooperative Problem-Based Learning (CPBL)
- On becoming a PBL practitioner ...



## Doubling the knowledge base:

1750 – 1900: 150 years to double

1900 – 1950: 50 years to double

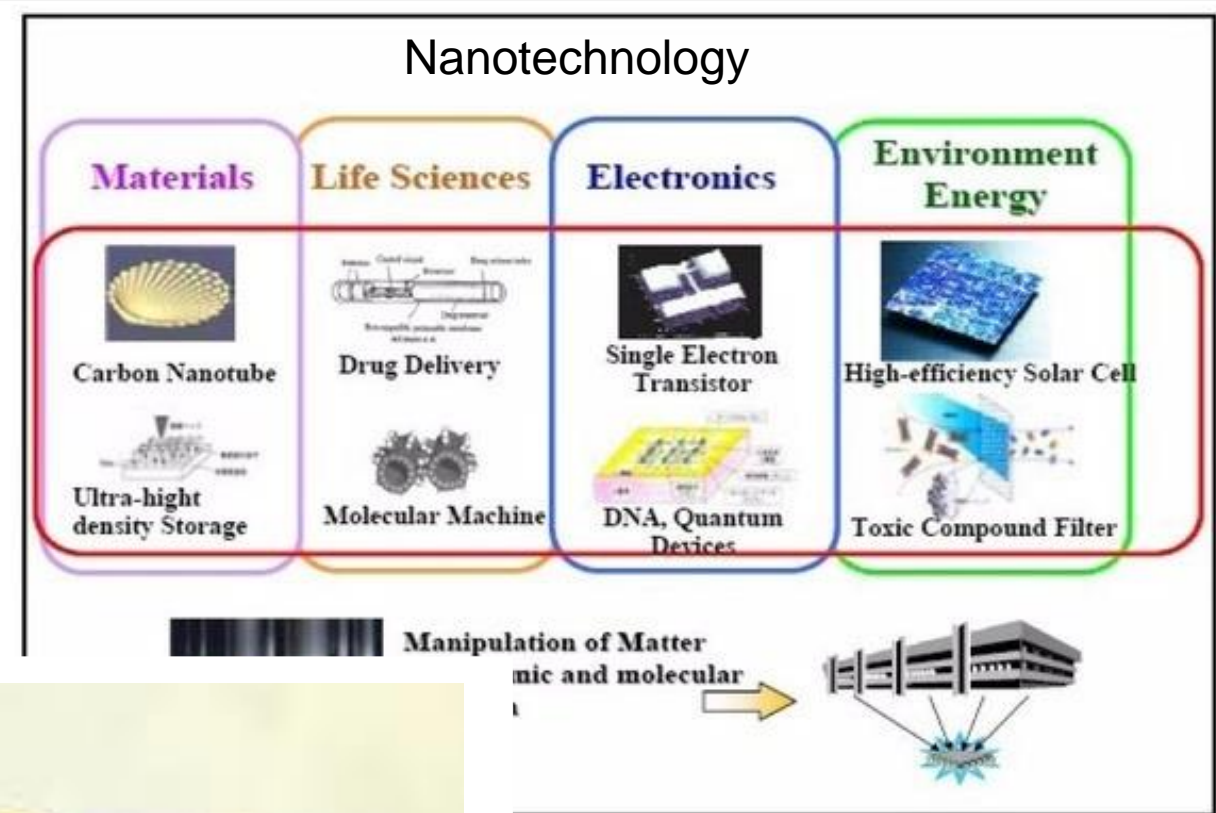
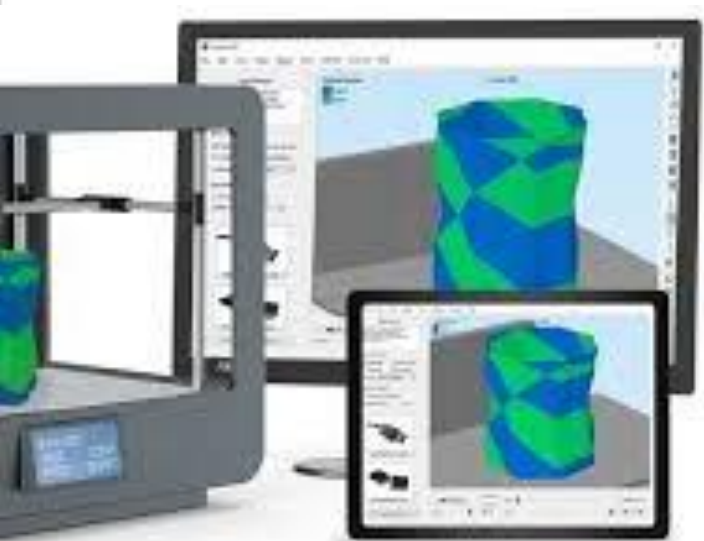
1950 – 1960: 10 years to double

1960 – 1992: 5 years to double

# The Information Avalanche from advancement in digital technology









# Theranos – Elizabeth Holmes



## Theranos: Scandal hit blood-testing firm to shut



05 September 2018 | Business



Theranos founder Elizabeth Holmes is facing criminal charges of wire fraud

Scandal-hit US blood-testing start-up Theranos is to formally dissolve, the firm's chief executive David Taylor has told shareholders in an email.

businessinsider.com









BUSINESS INSIDER

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### The rise and fall of Theranos, the blood-testing startup that went from Silicon Valley darling to facing fraud charges

Lydia Ramsey Pflanzner  
Apr 11, 2019, 11:55 AM



## THE WALL STREET JOURNAL.

BUSINESS | HEALTH CARE | HEALTH

## Blood-Testing Firm Theranos to Dissolve

Firm, tarred by scandal, will pay creditors its remaining cash



Elizabeth Holmes, CEO of Theranos, in New York in 2015. According to a new email to shareholders, the company plans to dissolve.

# So , what happened?



Effects of Climate Change?  
What about the Covid-19 pandemic?

Three Pillars of  
Sustainable  
Development –  
really caring for  
all that matters







So what characteristics must our graduates have to be future-ready?  
Vote by logging into: [www.menti.com](http://www.menti.com)

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- **Problem-Based Learning: Why and what?**
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## 21st-Century Skills

### Foundational Literacies

How students apply core skills to everyday tasks



1. Literacy



2. Numeracy



3. Scientific literacy



4. ICT literacy



5. Financial literacy



6. Cultural and civic literacy

### Competencies

How students approach complex challenges



7. Critical thinking/ problem-solving



8. Creativity



9. Communication



10. Collaboration

### Character Qualities

How students approach their changing environment



11. Curiosity



12. Initiative



13. Persistence/ grit



14. Adaptability



15. Leadership



16. Social and cultural awareness

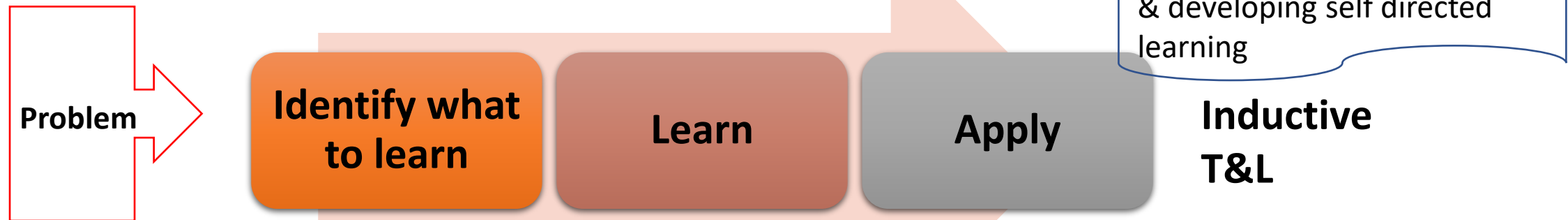
## Lifelong Learning



## Commonly used Teaching and Learning (T&L) Model



**PBL: Is it possible to turn it the other way around?**



# Why use problems?

## The Psychology behind using PROBLEMS...

Multi-dimensional and **integrative**

Leads to **immersion**  
and **engagement**



**PROBLEM**

catalyst for **inquiry, learning**  
and **problem solving**

Mimic **real-world** demands

**Activates prior knowledge** as a  
base to acquire new knowledge

# The PBL philosophy

- A constructivist perception of learning and teaching:
  - **Learning** is the student's individual process of constructing knowledge and meaning
  - **Teaching** is the "setting up of a situation from which a motivated learner cannot escape without having learned" (Cowan)
- In other words: Student-Centred Learning (SCL)
- Many different models exist



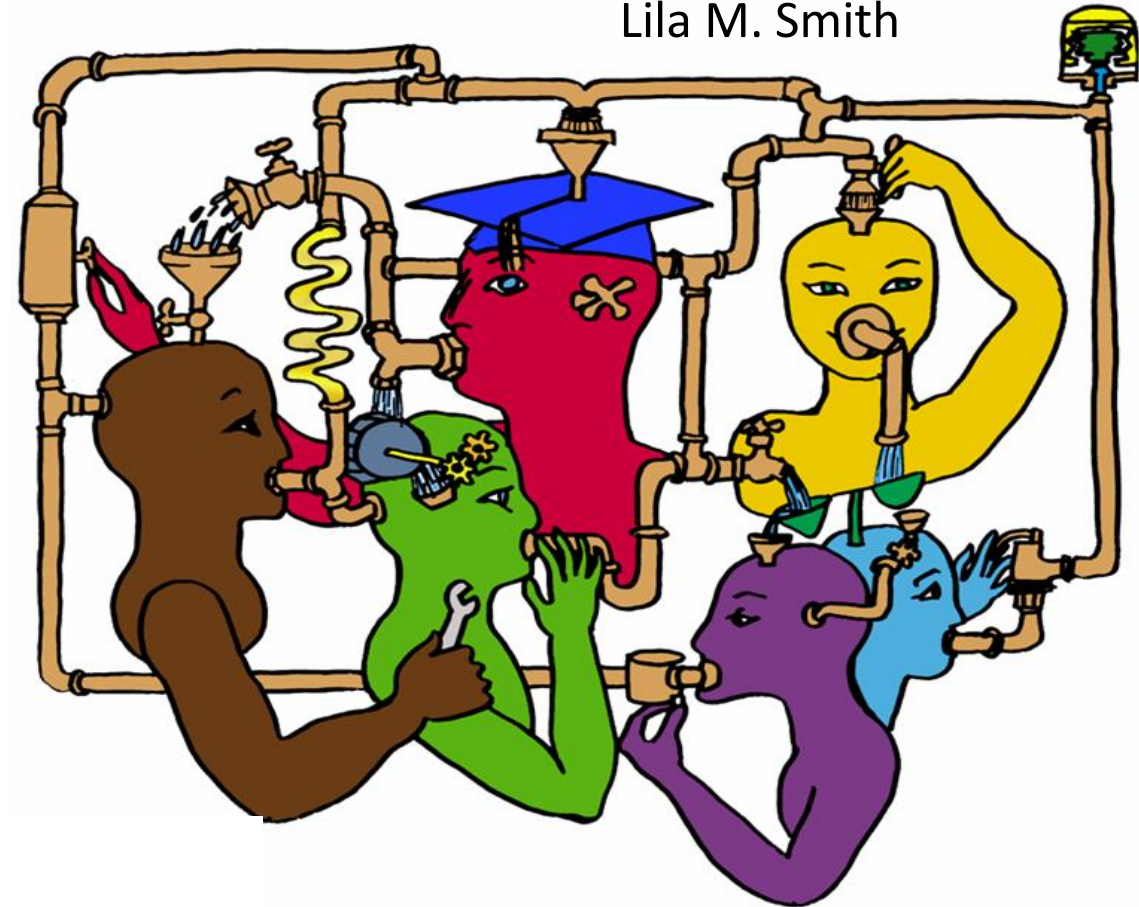
Adapted from  
Dahms, M. (2007)



“PBL in the classroom is not only about infusing problems into the class, but also about creating opportunities for students to construct knowledge through effective interactions and collaborative inquiry.”

Tan, O. S. (2003) in  
*Problem-based Learning Innovation*

Lila M. Smith



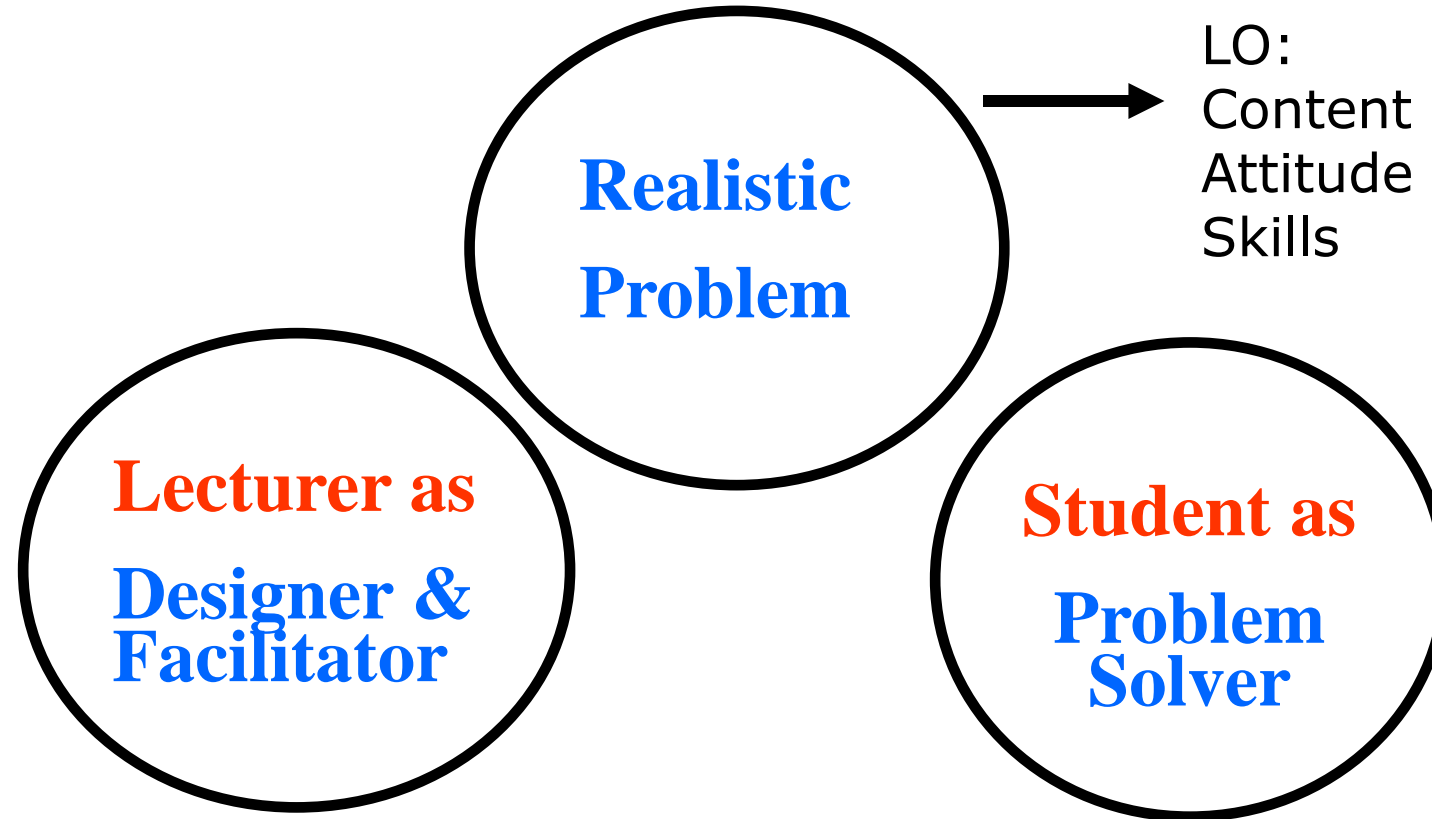
**Re: Plant Visit Reflection** by student A- Sunday, 2 April 2006, 08:41 PM

Dear friends who go to plant visit : 1. what is the relationship between the feed in percentage of fatty acid will effect the fatty acid in IGPO? e.g : is that true when increase %FA in feed flow, the FA in IGPO will increase? 2. Does the feed 1500kg/hr is constant ? can we manipulate it ? 3. I just want to confirm is that true that increase of pressure will increase the FA in IGPO ? 4. How many control system that we actually need to design? is that unlimited or just those which is necessary?

**Re: Plant Visit Reflection** by Student B - Tuesday, 4 April 2006, 11:00 AM

1)SOO HUI, u ask abt da flowrate of fatty acid right?actually the flowrate off fatty acid from the storage tank is control by pump..so, its not highly fluctuate, cz already got pump.  
2)actually, we reduce the amount of fatty acid from in the feed.that is (15% to 3%)..so to reduce the FA% contain in feed, the temperature actually high than 300oC at atmospheric preesure. thats why this company try to reduce the boiling point of the oil by reduce the pressure,..this concept is simillar, when u boil the water at low pressure..the boiling point of water is 100oC at atm pressure,but at lower preesure,the boiling point is < than 100oC.  
3)the most important control variables is temperature in the stripping column, but we still need to control level.in order to control temperature, we must maintain our vacum pressure,

# Problem-Based Learning Approach



Facilitation skills required to make thinking visible. Proper assessment made on both content and process. Need TRAINING!

Do not readily have the skills for PBL – must be prepared and motivated by lecturers

Adapted from  
Tan, 2003



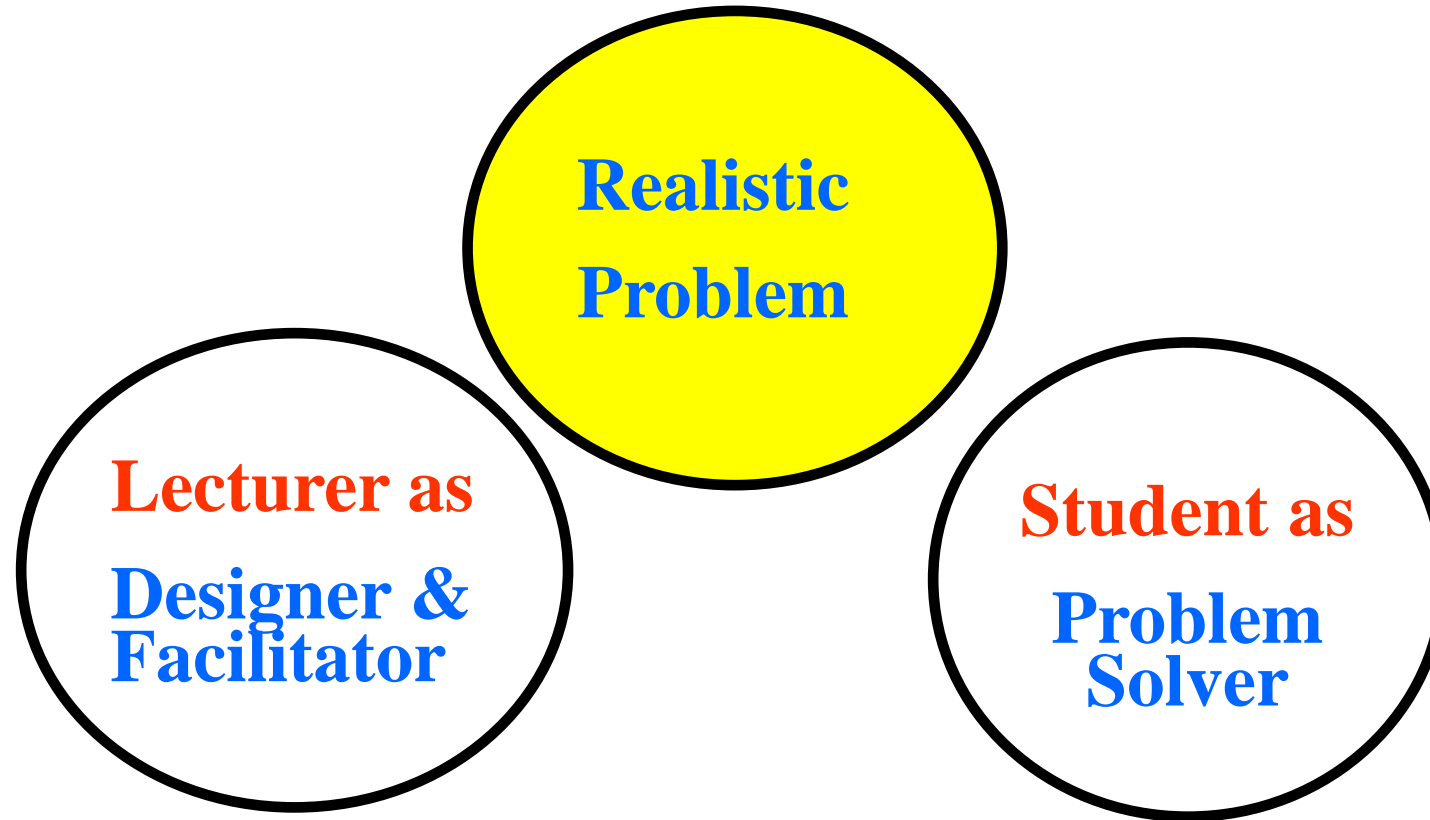
## Part of a 3<sup>rd</sup> Year Student's Meta-reflection

*I felt, this class is incredible. **Technical knowledge** is a definite yes, of course we learnt what was supposed to be learnt, those things covered in the course outline. But more importantly, I think my **thinking have matured**, I think I learn how to **look past what is in front of the eyes**, and I think I can **control my emotions** better now compared to how I was when I first entered uni....I also **discovered some weaknesses** which I need to improve on. First thing first, I need to get some of my **negative thinking out of the way**, and focus more on the good stuff so that I don't get depressed so easily as I do now, haha. Second of all, I need to learn to **calm down at critical times** to think rationally. And third of all, I need to **welcome feedback, opinions, and different perspectives** in a better and more open-minded way.*

# Outline

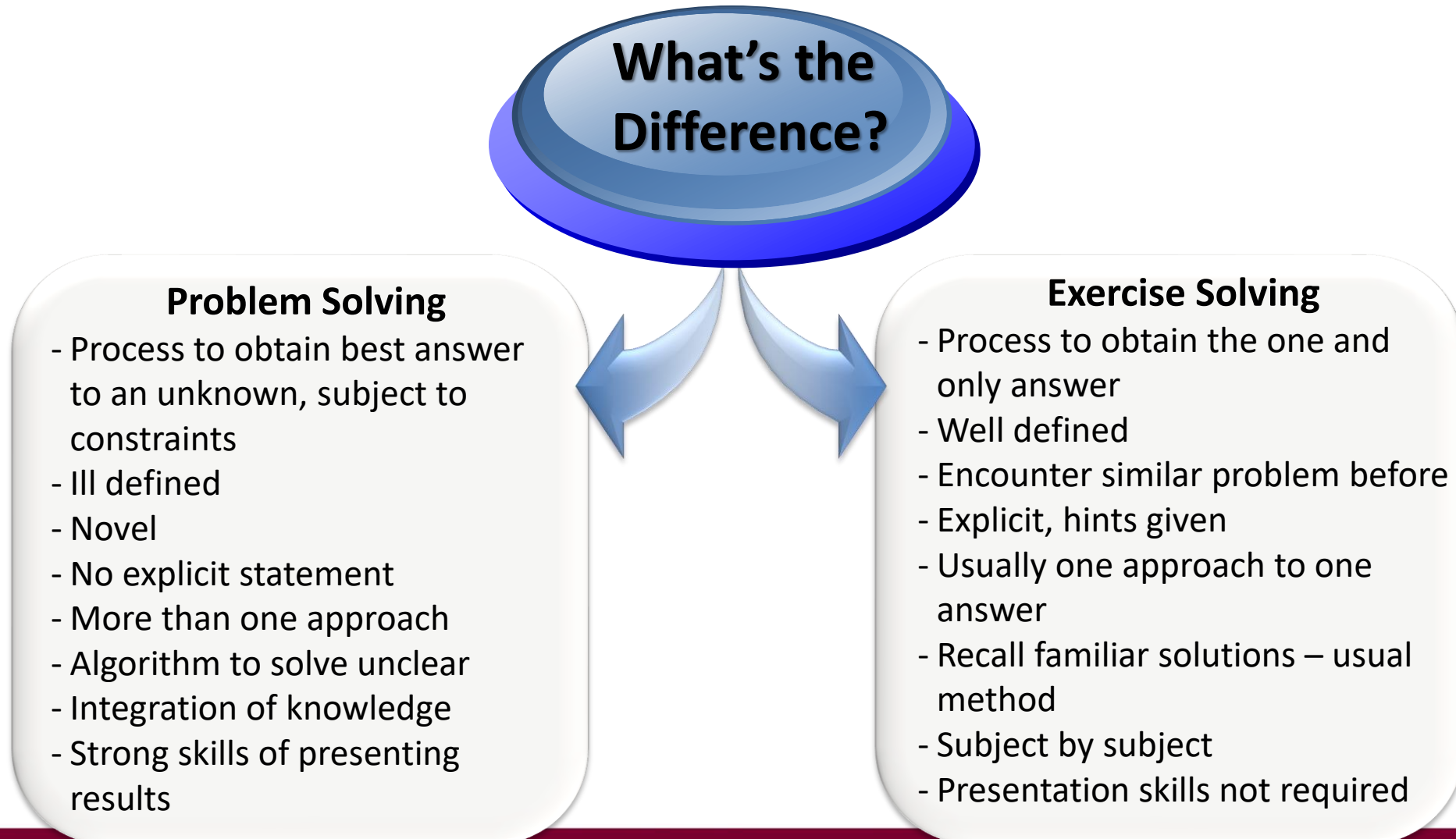
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# Problem-Based Learning Approach





# Problem Solving Topology (Syed Helmi, 2011)



# Sample Problem 1 – A

## (Facilities Planning)

You are a group of the students' representative for UTM Students' Society. Due to the demand from your friends, especially the Southern-Tiger's Football Club fans, your society is planning to open a Mamak restaurant in UTM Skudai. The society allocated RM250,000 capital investment for this project. Where will you establish your first restaurant? Keep in mind that your task is to make as much profit as possible from this investment.

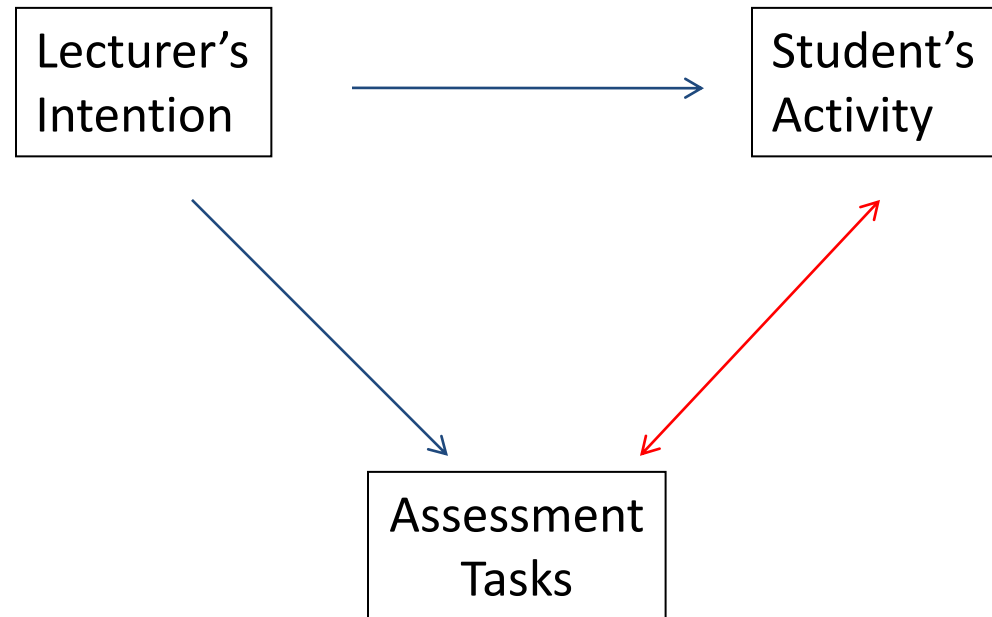
(Syed Helmi, 2015)

# Where to start when crafting problems?

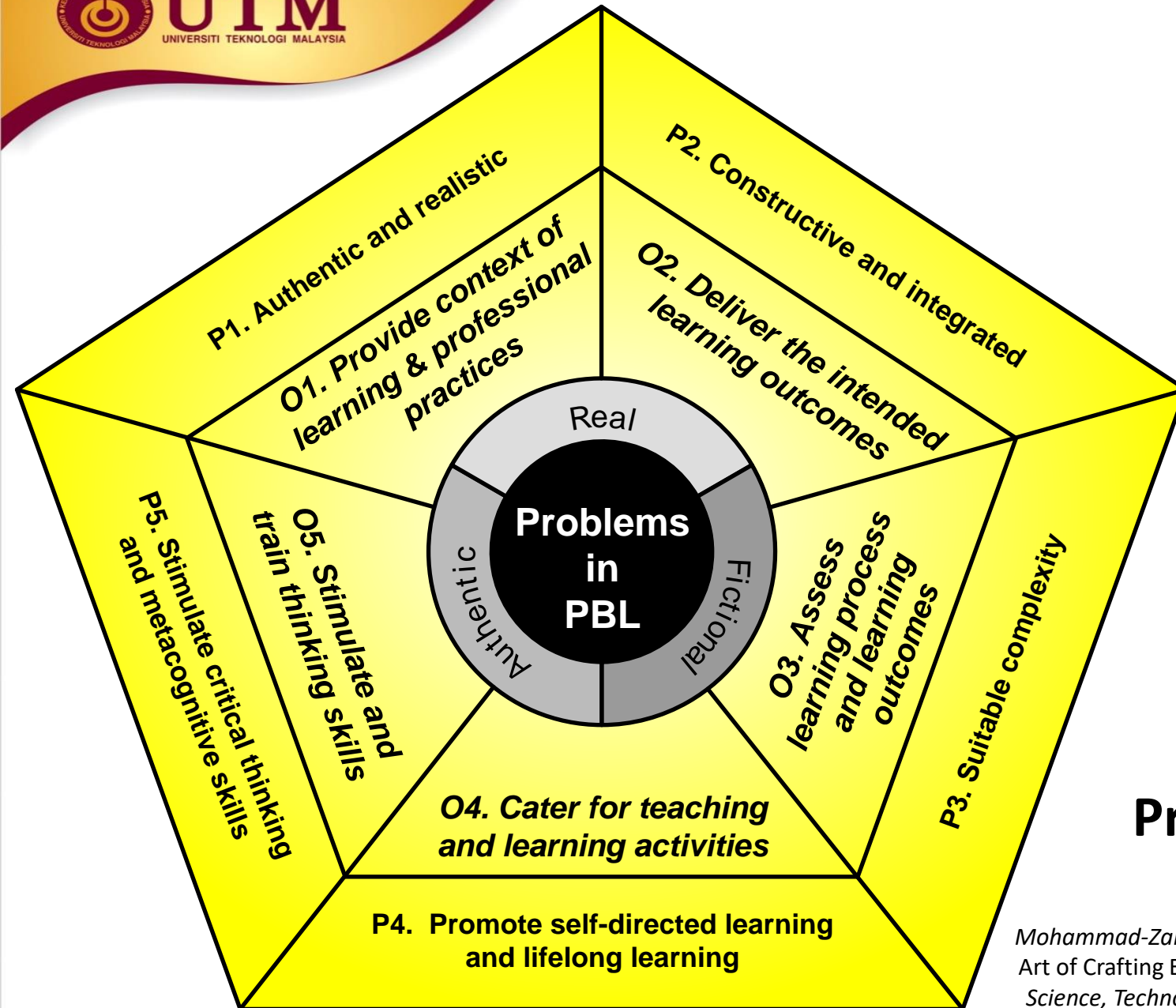
## Constructive Alignment (John Biggs, 1999)

Intended outcomes must clearly  
be indicated

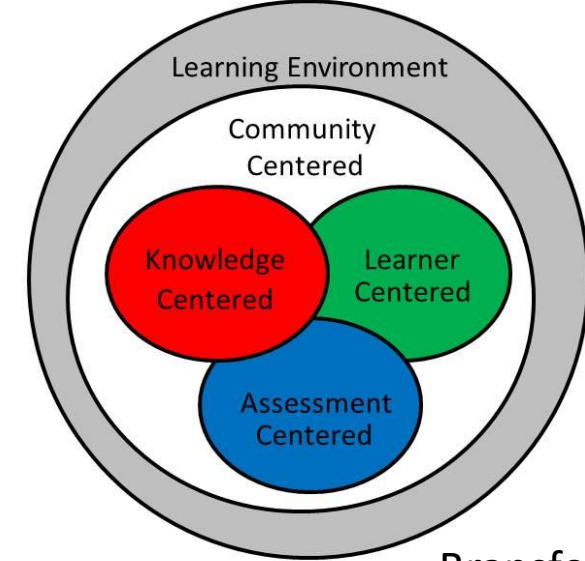
Activity will match  
outcomes



Assess intended outcomes



## How People Learn Framework



Bransford et. al,  
2001

## Principles of Crafting Problems

Mohammad-Zamry, Khairiyah Mohd-Yusof, Nor-Farida, Syed Ahmad Helmi, A Guide to the Art of Crafting Engineering Problems for Problem Based Learning (PBL), in *Outcome-Based Science, Technology, Engineering, and Mathematics Education: Innovative Practices*, 2012



## Polystyrene (M) Sdn. Bhd.

[www.polystyrenemalaysia.com](http://www.polystyrenemalaysia.com)

PLO 4225, Jalan Perdana 3/5,  
81700 Pasir Gudang, Johor.

Tel: +607-8508290  
Fax: +607-8508291

Dear candidates,

The selection committee of Polystyrene (M) Sdn. Bhd. is very interested in interviewing your team for the opportunity to undergo industrial training at our company. The interview session is scheduled on 28<sup>th</sup> December 2009, from 10 a.m. to 12 noon, in the meeting room, Human Resource Department, Polystyrene (M) Sdn. Bhd.

With regards to the interview session, we would like you to demonstrate your understanding on one of our processing plants, the HDA Process, in a 3-5 page report. Please systematically describe the process from a system's point of view. Be sure to include the input and output variables involved in the process. Explain all the automatic control systems: classify the variables, identify the control objective, and identify the control configuration used for each control loop. Please comment if the control configurations used are sufficient to tackle the disturbances. Enclosed are the process description and a simplified P&ID of the HDA Process for your reference.

Sample problem for  
Process Control and  
Dynamics, a 3<sup>rd</sup> year  
chemical engineering  
course

Outcome:  
identify manual, feedback,  
inferential, feedforward,  
ratio, split-range and cascade  
control systems for  
commonly controlled process  
variables.

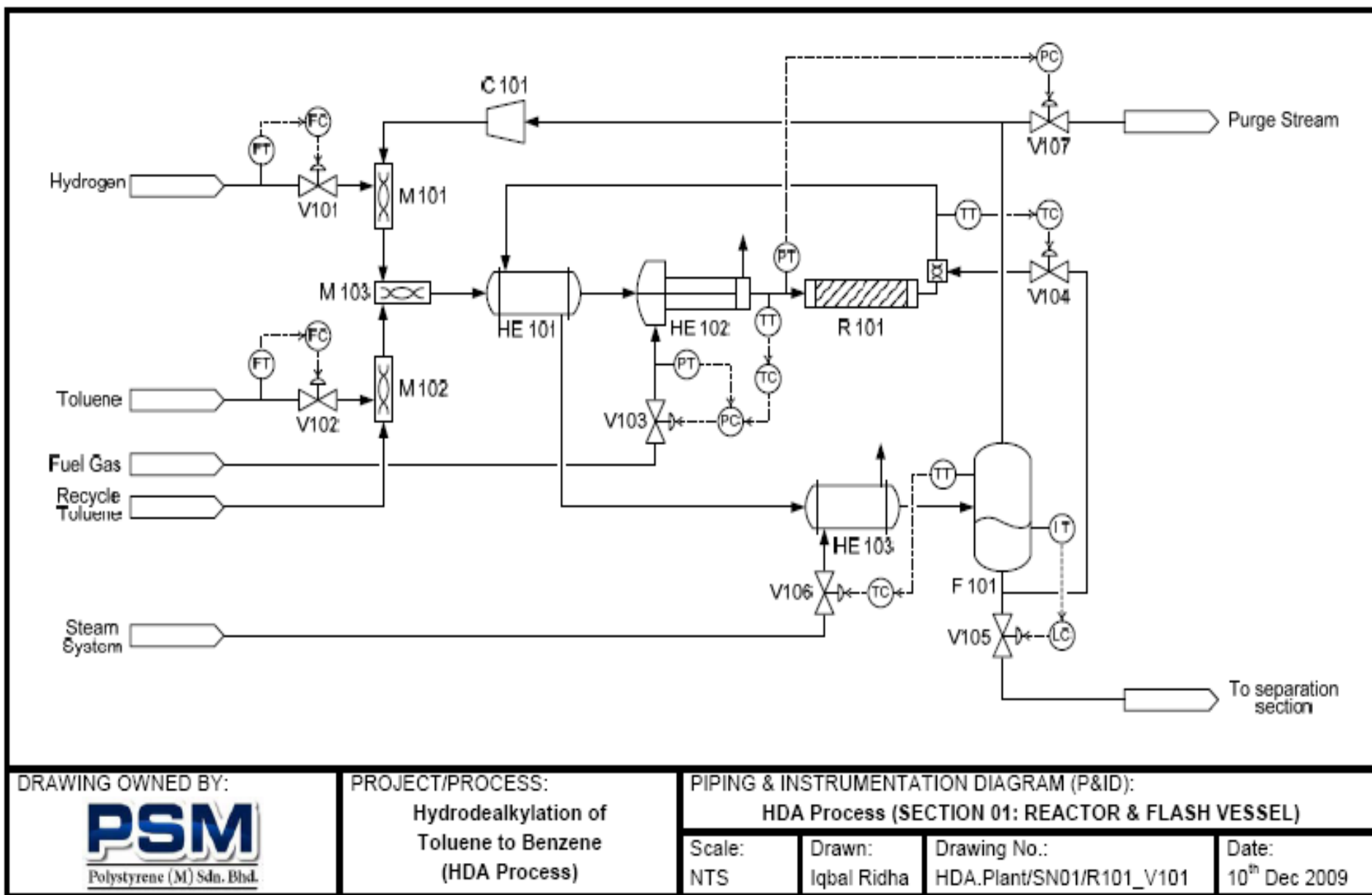


Figure 1: HDA Process

Part of FGD report on students who had undergone CPBL  
(Strobel, 2008)

Theme: Relationship between PBL class and industry  
experience

Since the students just returned from an industry experience over the summer, the researcher added an additional line of questions to capture students' thoughts on the difference between their PBL class and their industry setting. Primary interest was the assessment of the students of the authenticity of the PBL environment in light of their very recent industry experience.

Students mentioned that they were **not “afraid” or “unprepared” to get into their industry experience**, since they counted their **PBL class as a precursor or “small industry experience”**. When pressed to compare the two, students acknowledged that the PBL class was small scale authentic compared to the industry experience.

Two students shared more details: They described how in both, **the PBL class and in the industry setting, they had to perform a similar task**. While in the PBL class the volume was a couple of pages, in industry the amount of material was several large manuals. The industry experience needed them **to scale their experience up**.



# Social Science Problem

- Complex but students always assume it can be solved without conducting any learning, searching, self-reading etc. – Common Sense / Logical thinking solution based on existing thoughts – NOT FACT!
- Social Science problem always looks familiar to students.

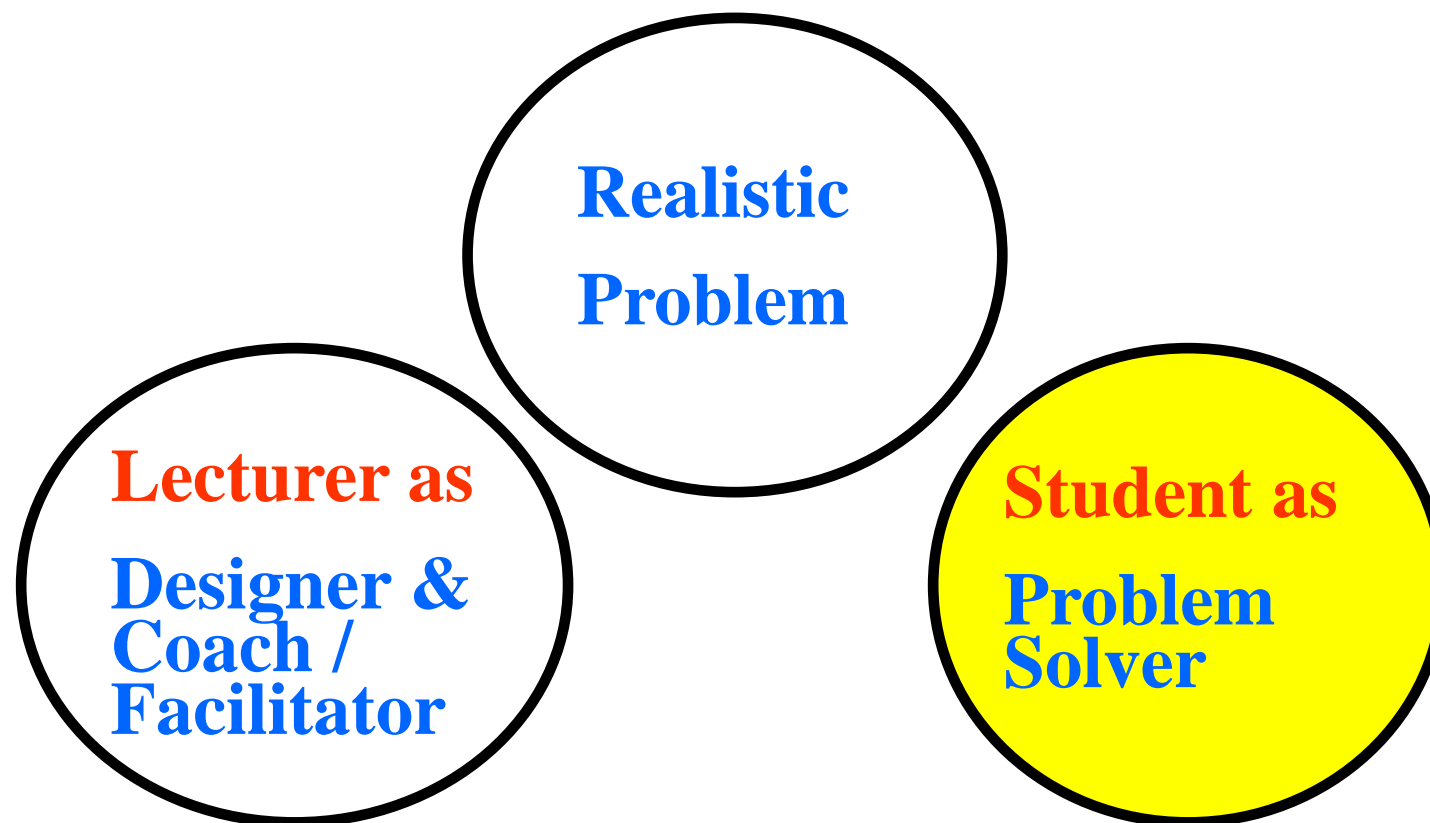
# Example...

The collapse of Highland Tower signifies the disastrous construction practice. Failure to provide proper advice and service as required by the professional body can be damaging. As highlighted by Judge Azlan, failure to conform to the standard practice may lead to negligence. Based on some remarkable cases such as Dr. Abdul Hamid vs. Jurusan Malaysia Sdn. Bhd. Analyse and comment on the existence of tort liability in the project undertaking. Highlight some important concepts negligence together with the supporting evidences.

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# Problem-Based Approach





Coping with change – need to explain and rationalize => MOTIVATE!!

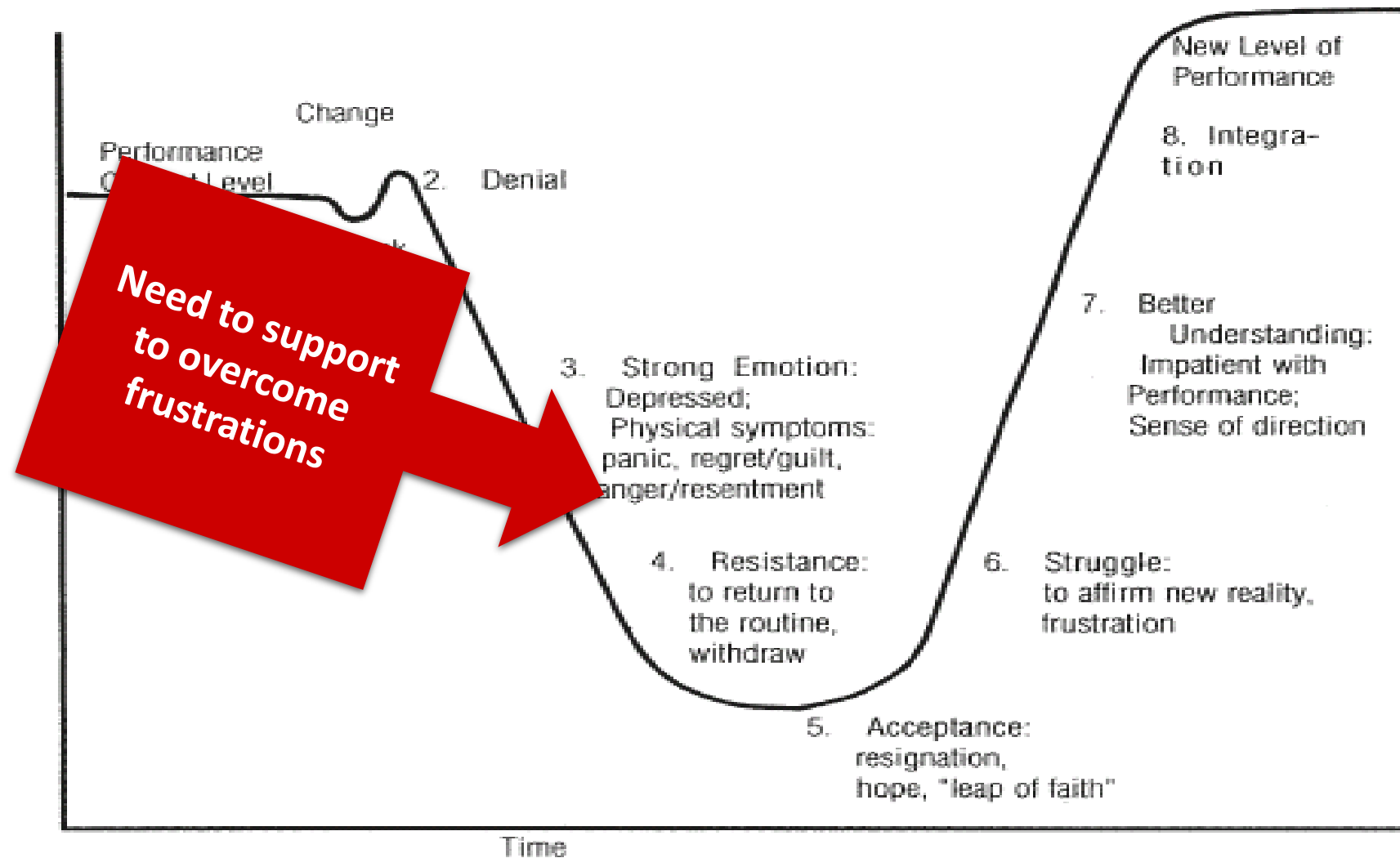


Figure 1-1 The *grieving* process as a model of how we cope with change

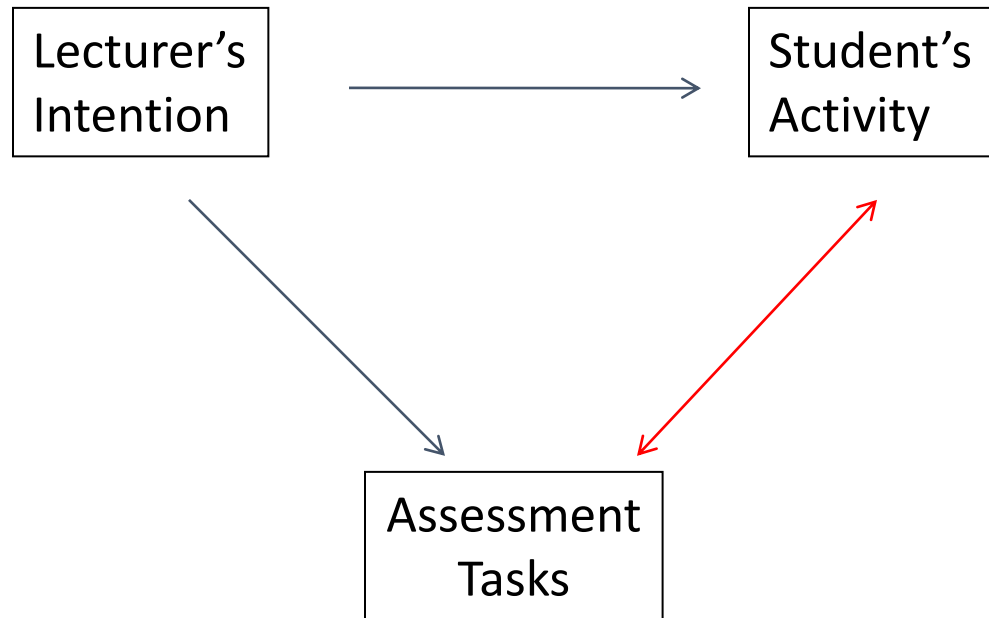
Woods, 1994

# How to support students to reach the outcomes?

## Constructive Alignment (John Biggs, 1999)

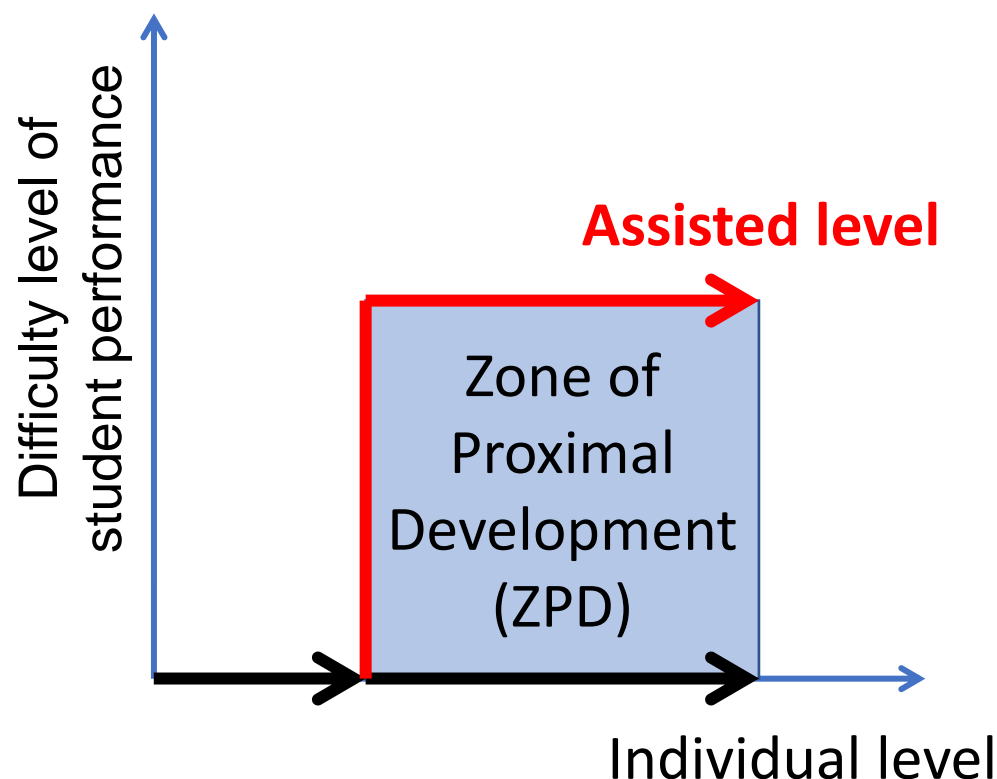
Intended outcomes must clearly  
be indicated

Activity will match  
outcomes



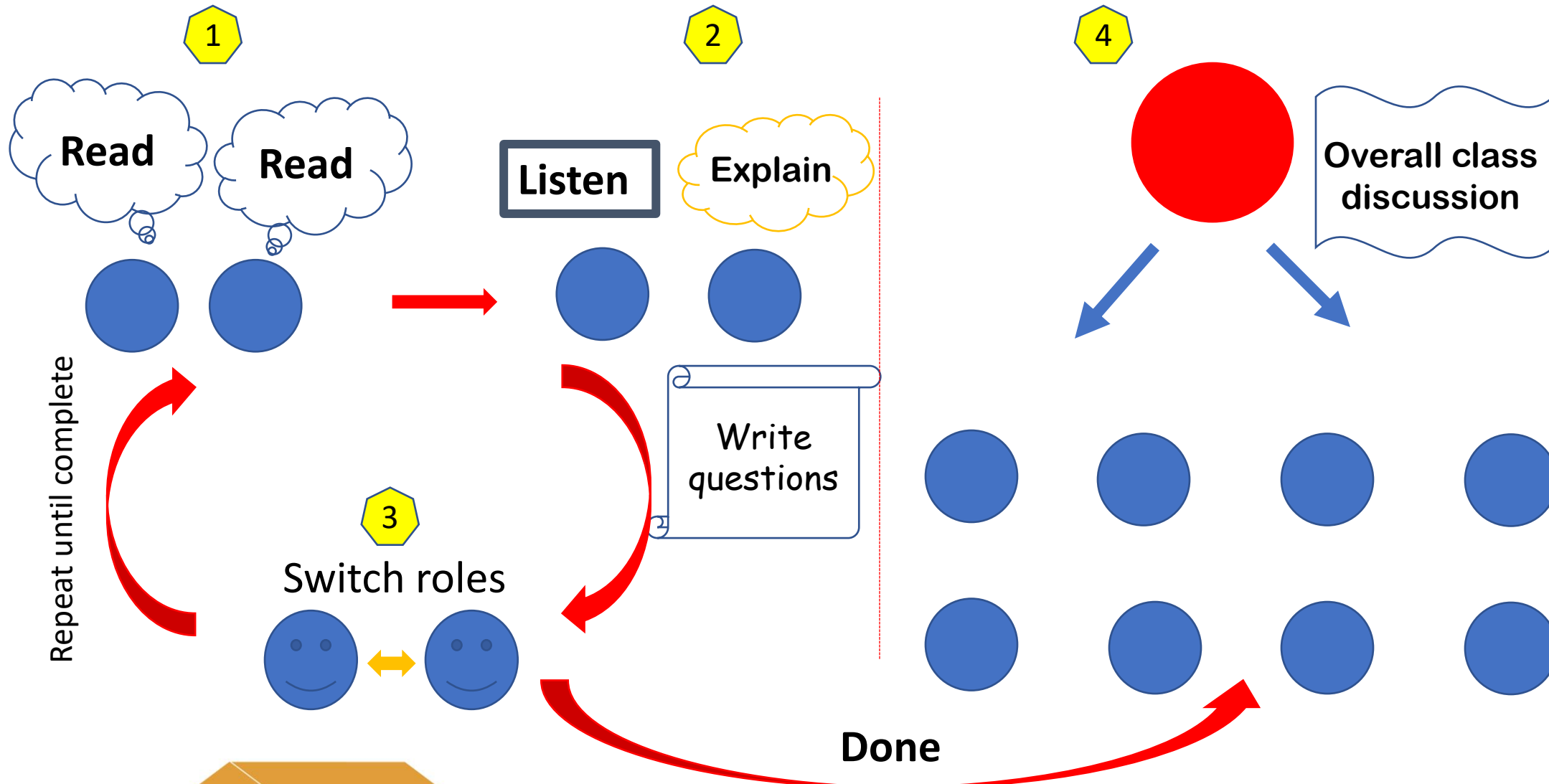
Assess intended outcomes

# Scaffolding to support student learning



ZPD = Distance between individual performance and performance with social support (Vygotsky)

# Sample scaffolding: Read & Explain Pairs





## Motivation Scaffolding from alumni who had gone through CPBL

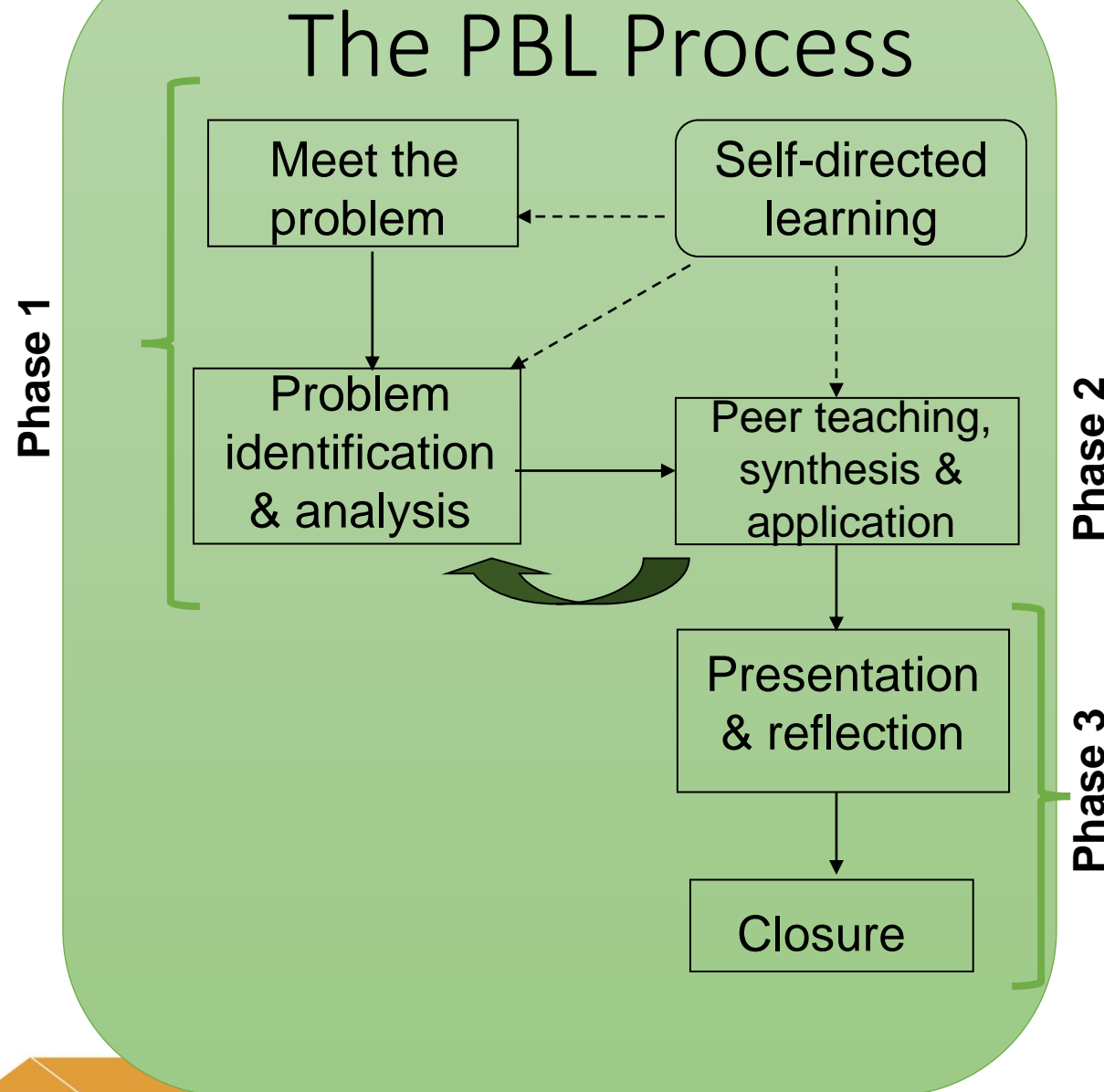
### Alumni A: Currently a senior lecturer in a university

In reality, CPBL has a bigger **impact on self discovery, self directed learning and also deep learning**. I take an example in the company I have work with before. I was appointed as an Engineer to support the production department and increase the production capacity and efficiency. Having a background in Chemical Engineering doesn't help me much in the company business since it is more towards manufacturing, mechanical, electrical and electronics. I was introduced to a field that is totally new to me. I have to learn new terminologies, new jargon, new system that I have not encounter before. But I would say that having the experience with CPBL really help me in those days. Having a clear mindset to solve a problem in which I have never encounter before. **Yeah, seems like CPBL all over again**. But this time, you are facing with real problems and real people with real machines and you are held accountable on each and every little words that you say in the team meeting. Hence, the info gathering has to be swift and accurate, sources must be reliable. It really help me in being more independent and delivering the job in more accurate and efficient manner.

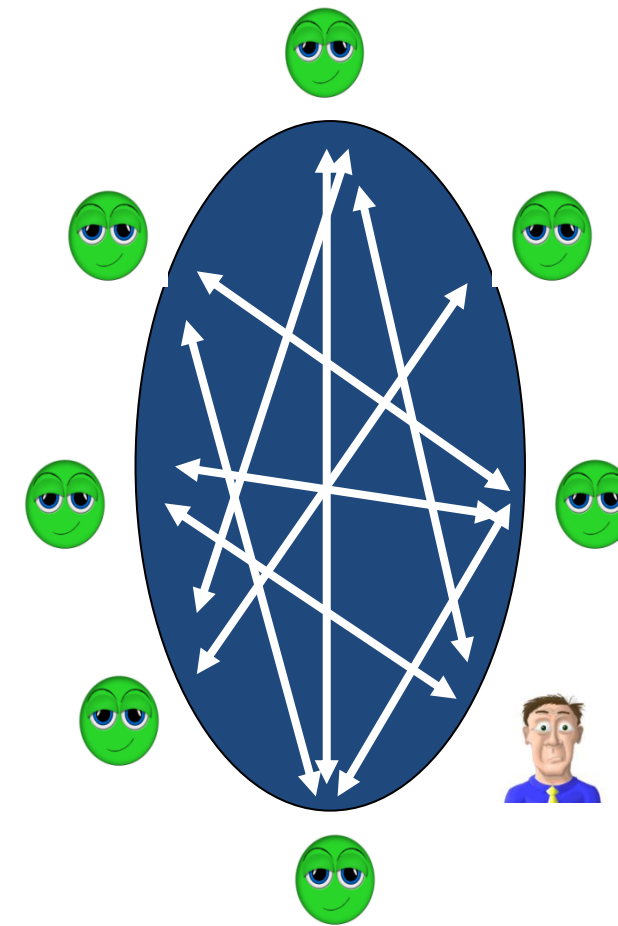
## Alumni B: Leadership level in multi-national Oil and Gas company

What I think and feel on CPBL??? It is the perfect platform to warm me up **from a "student thinking" to a "real-life thinking"** when I first got myself into the working world. Prior to PBL, I was brought up via conventional text-book learning methodology where all the problems were explicitly defined and solutions were pre-determined. The disadvantage with this conventional way of learning is confining us (Engineer) that every problem/issue that we faced will only be resolved with a certain solutions. In my experience of the working in the O&G industry, this is certainly not the case.

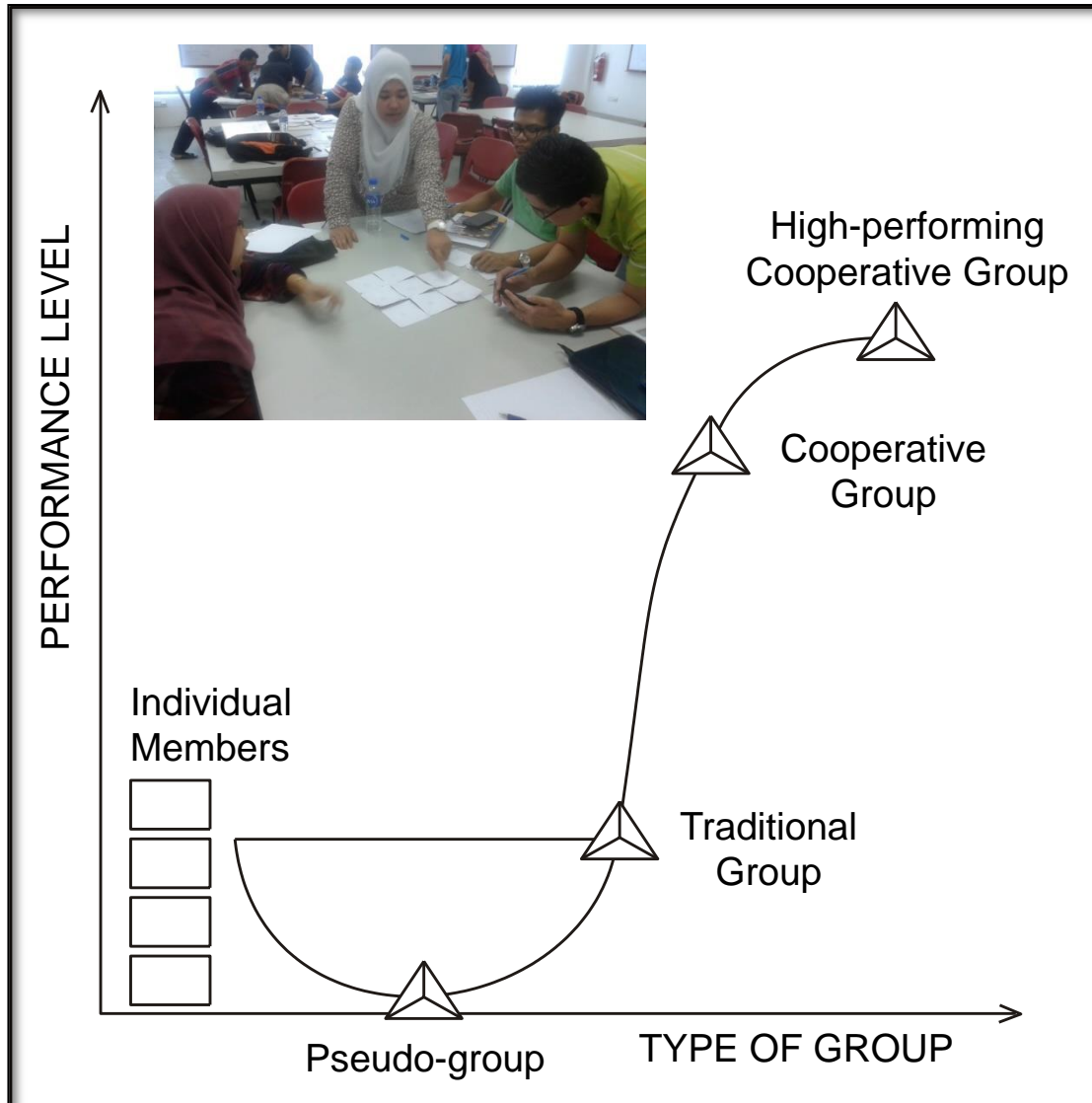
When I got the offer as Internship Trainee, besides the offer letter, what came together was an email from my Line Manager on what is my job tasks in the Internship training. Guess what? **Reading the email gave me a very similar "feel" as the Case Study assignment that I've been doing in the E-learning via PBL** with Prof. Khairiyah and this is why I could assure you CPBL is the **perfect "warm-up"** of transitioning a Graduate to an Engineer. It can be **frustrating, painful and troublesome going through this learning process but I can assure you that you would be grateful** that you are exposed in a learning environment in University where you are well guided and it's OK to make mistake and learn from it. Working in the industry, it's NOT OK to make mistake as the consequences could be catastrophic. Hence, my sincere advise to you would be to cherish this golden opportunity where you could make full use of this learning opportunity in developing you to be a successful Engineer in future.



## Typical PBL Medical School Model



# Cooperative Learning Implementation: Performance Level of a Group (from K. Smith, 2007)



## Cooperative Learning Principles

Positive interdependence

Individual accountability

Face to face interaction

Appropriate interpersonal skills

Regular group function assessment

## Informal Cooperative Learning Pattern

Involves  
everyone!

Individual  
construction



Construction and interaction  
with neighbor/team member

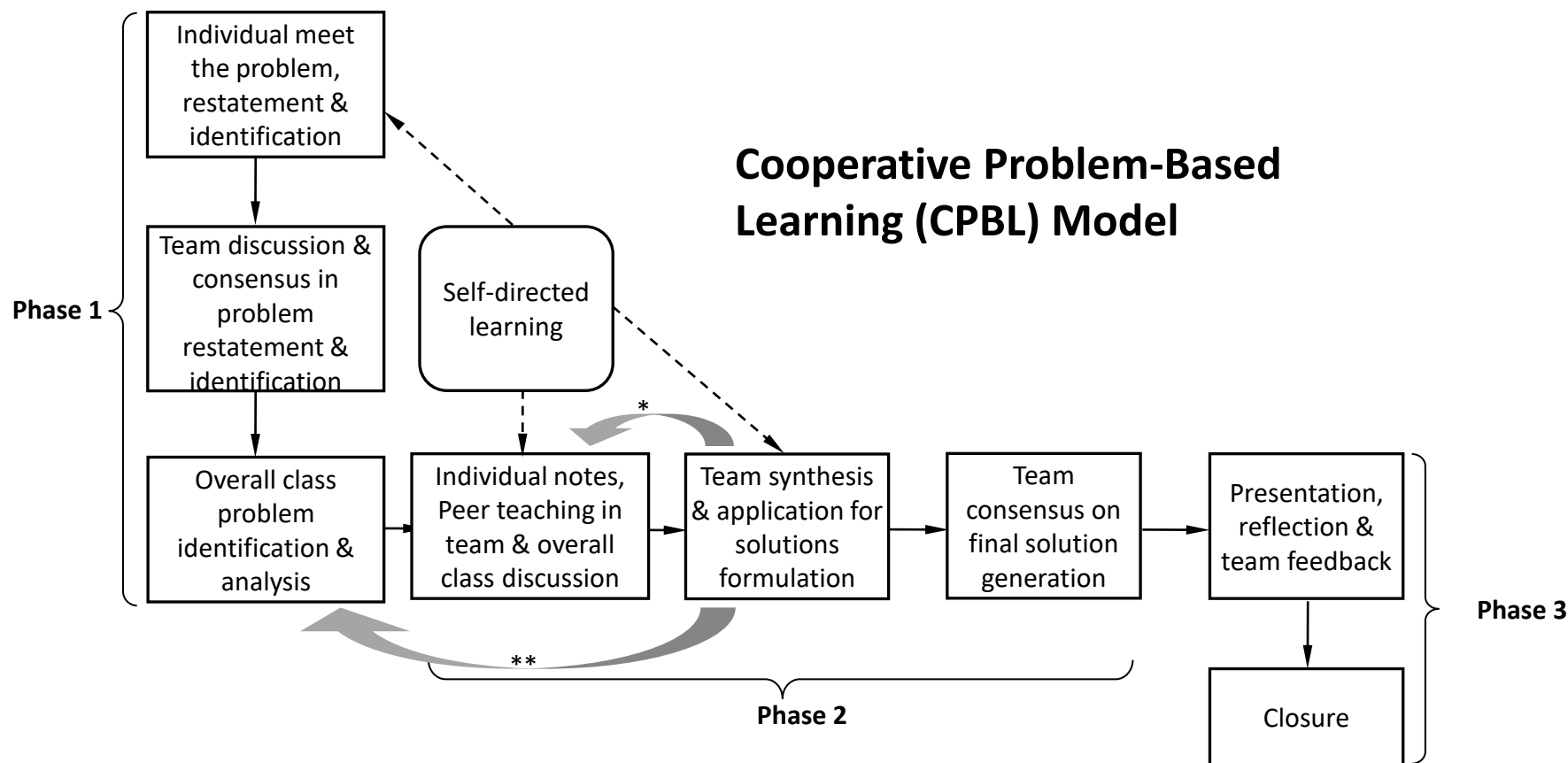


Overall class interaction with  
instructor





# Cooperative Problem-based Learning (CPBL)



\* Insufficient understanding of learning issues to solve problem

\*\* Incomplete or misunderstanding of problem requirements

Mohd-Yusof, et al 2011

# Typical class setting for CPBL in SCEE UTM

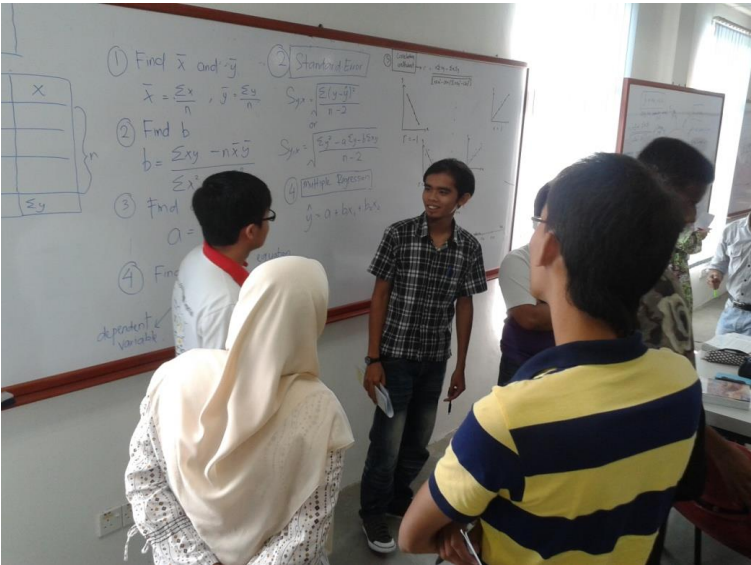


**Team peer teaching session**



**Overall class peer teaching session**

# CPBL Class at School of Mechanical Engineering UTM: Team and class peer teaching sessions





# class peer teaching and discussion using Jamboard and Padlet

12:36 PM Wed 8 Jul

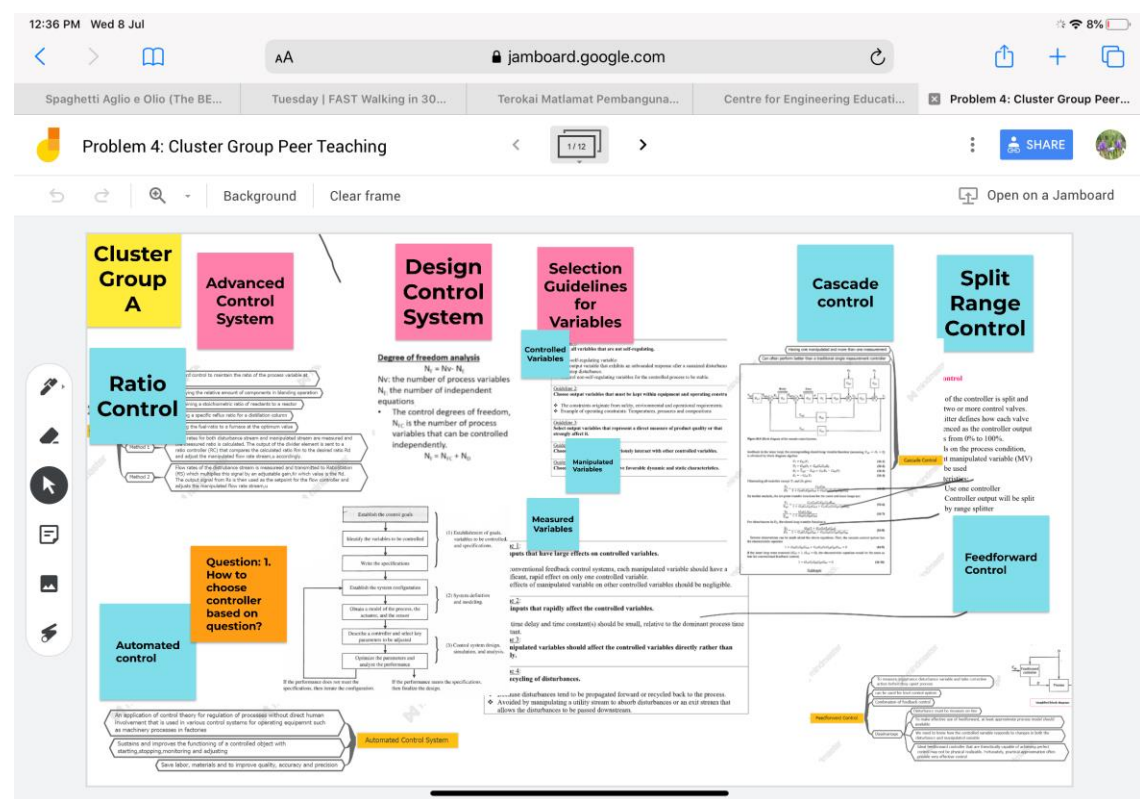
jamboard.google.com

Spaghetti Aglio e Olio (The BE... Tuesday | FAST Walking in 30... Terokai Matlamat Pembanguna... Centre for Engineering Educati... Problem 4: Cluster Group Peer...

Problem 4: Cluster Group Peer Teaching

Background Clear frame

Open on a Jamboard



12:41 PM Wed 8 Jul

padlet.com

Spaghetti Aglio e O... Tuesday | FAST Wa... Terokai Matlamat P... Centre for Engineer... Problem 4: Cluster... Dashboard 2B Discussion Padlet

Quiz Stage 2B

This is Group 4's answer for the transfer function of energy balance

Energy Balance Model

This is the energy balance model we discussed. Is this the correct method to relate composition of bottom product (xb) to amount of steam (m)?

if yes, May I know how to linearise the term highlighted in the box? or any other method to relate composition of bottom product (xb) to amount of steam (m)?

Case Study 2B

Do we need to substitute the relative volatility equation into component balance equation before we linearize it?

Stage 2 Discussion

1. How should we decide which unknowns can be represented by the K and tau?

2. How should we differentiate the unknown whether it is mass, molar or volume flowrate? As sometimes the unknowns use is q or w instead of m.

CASE STUDY 2B

A few confusions here regarding CASE STUDY 2B

1. May I know in most of the conditions, are we allowed to assume  $dm/dt=0$  (perfect control) for condenser and reboiler? Or still need to depend on specific situation?

2. Actually it is necessary to substitute in the relative volatility formula before we do our linearization?

Thank you.

Case Study 2B

Group 1

After we watched the presentation videos from both groups, we found that our solutions are almost in the same way. However, there are some parts we are confused on when we completing our task: 1)When link the feed tray to reflux drum to find

Case study 2B

1) How to calculate steady state gain and time constant?

2) How do we decide the unknowns used for K and 'tau'?

3) Why is the deviation variable of vapor and liquid flow (V' and L') in the stages must be consider. Can it be zero?

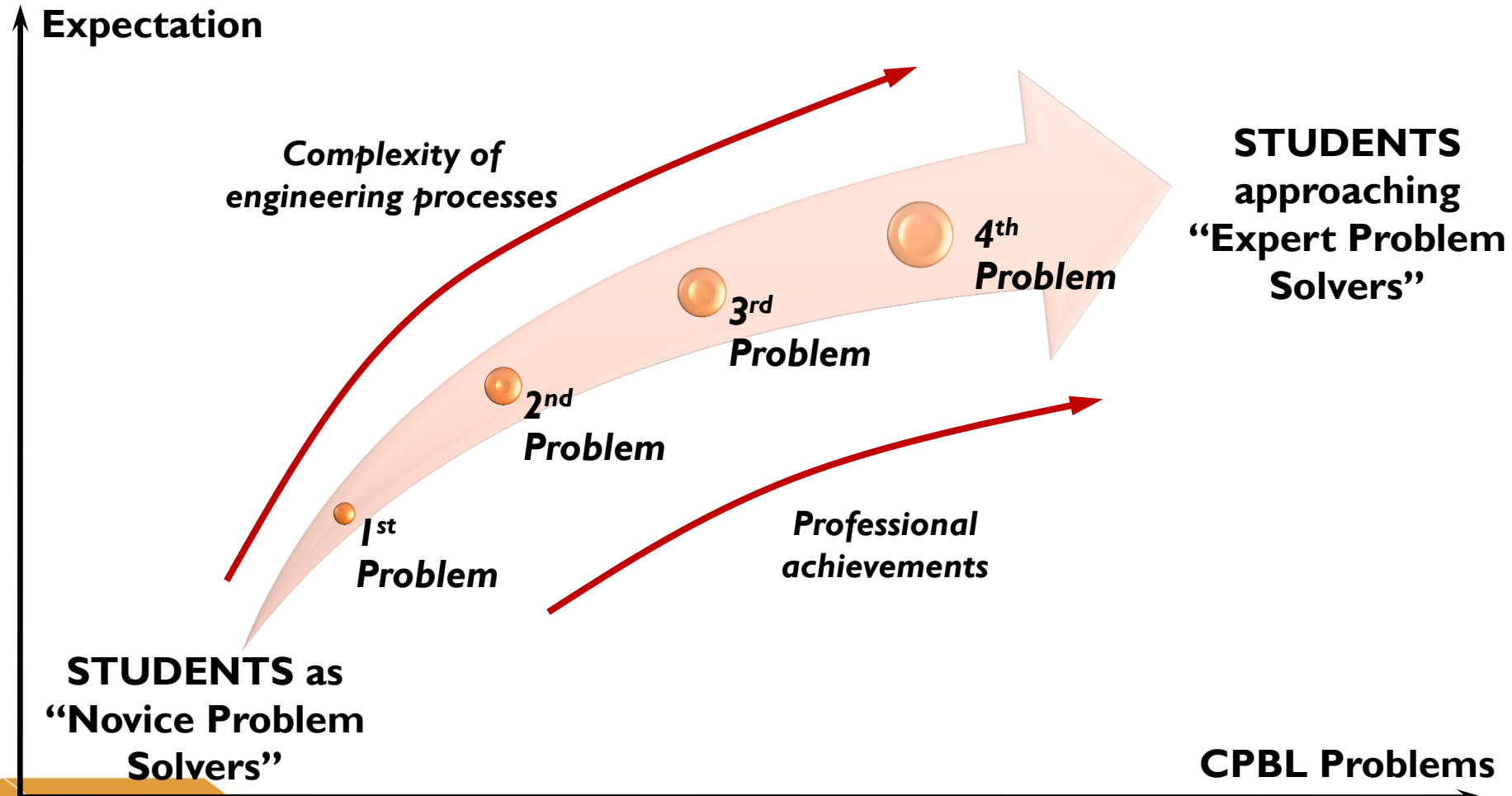
Case 2A and 2B

Basically we understand the presentation from group 5 and group 10. Our concept of solving is similar with them.

We have a question to ask. When constructing the balance of a system involving

## Series of Problems

Scaffolding in organization of problems for a whole semester in a course



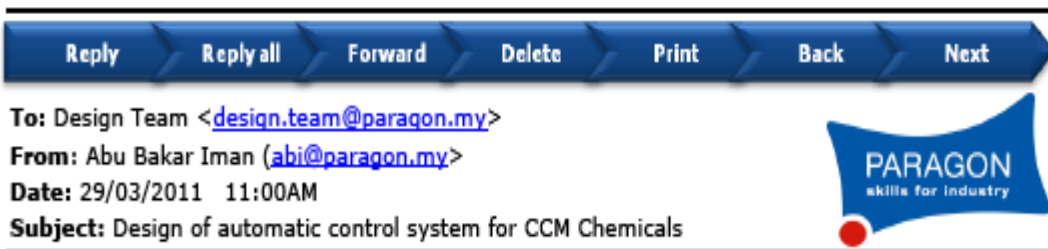


## FINAL CASE STUDY

### Design of Automatic Control System for CCM Chemicals (M) Sdn Bhd

#### The Scenario

Now that you have experience as a process engineer, you have decided to join a process control consultancy firm, PARAGON Consulting Sdn. Bhd.. You are hired because of your knowledge in chemical engineering, experience as a process engineer, and credentials. Since many of the firm's engineers are electrical and mechanical engineers, your job scope includes: i) provide expertise to other engineers to understand, describe and analyze chemical processes, and ii) design automatic control systems for chemical processes. One Tuesday morning, you received the following email from the general manager:



Good day engineers,

I had a meeting with CCM Chemicals' plant manager last week. They are now having problems with the existing control systems of their chlorine gas absorption processes. To be specific, they are facing difficulty to maintain the process variables at the desired operating conditions. Plus, they are experiencing inconsistencies in the online measurement of the product specs too. There are two chlorine gas absorption columns operating, as part of Chloralkali Process for chlorine production, in the company. At the moment, CCM Chemicals is urgently looking for a prospective consultancy firm to solve these problems. Due to our excellent track record in the previous consultancy projects, they've invited us to bid for this project. Therefore, I want your team to design/modify the



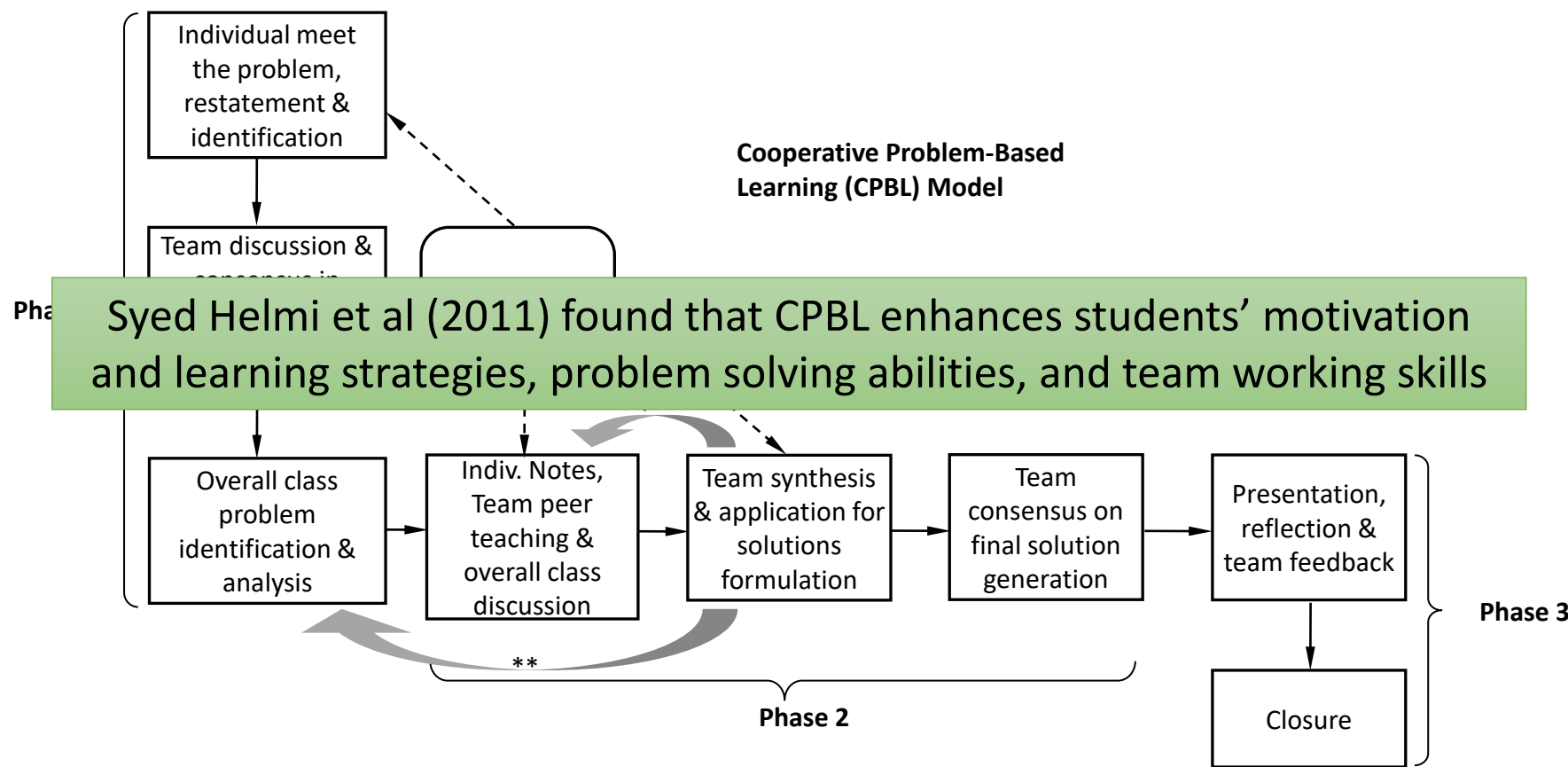
Real industrial problem:  
Infusing deep  
understanding and  
professional skills  
development among 3<sup>rd</sup>  
Year Chemical  
Engineering Students







# Cooperative Problem-based Learning (CPBL)



\* Insufficient understanding of learning issues to solve problem

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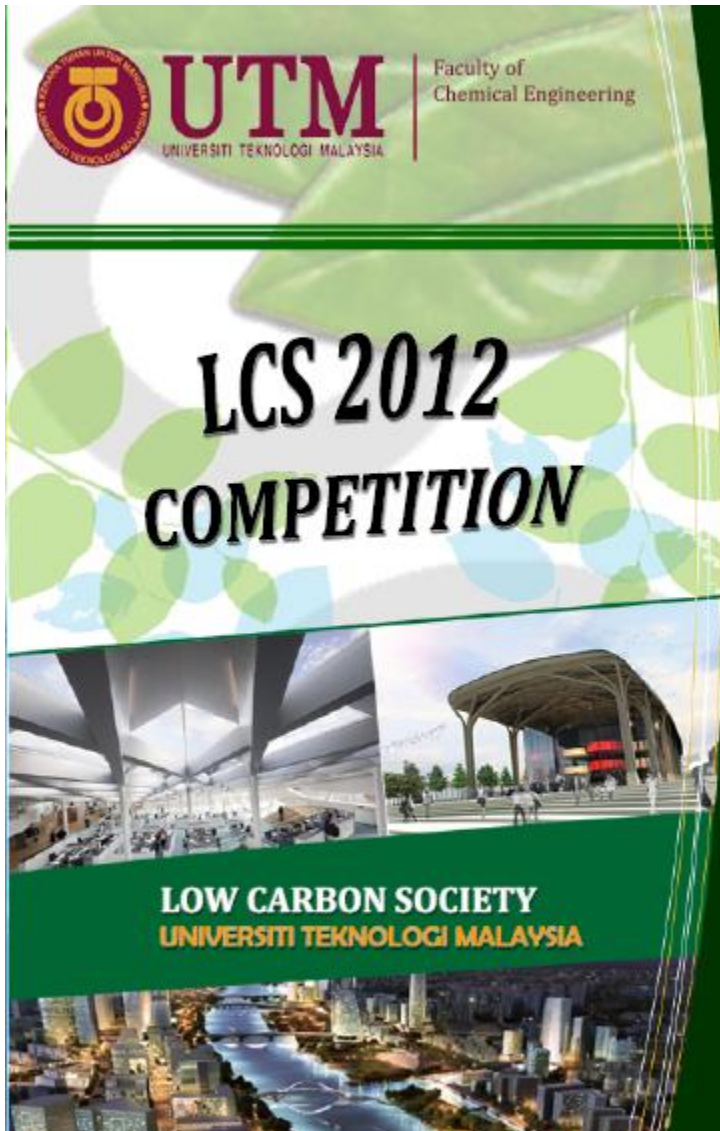




# INTRODUCTION TO ENGINEERING

## Water Conservation Problem





## INTRODUCTION

In line with the region's vision of "a sustainable metropolis of international standing", Iskandar Malaysia (IM) hopes to become a low carbon-emission society by 2025. As such, Low Carbon Society Competition (LCS2012) is organised.

Iskandar Regional Development Authority (IRDA) in collaboration with Universiti Teknologi Malaysia (UTM) would like to solicit ideas from all levels of its community to proposed an innovative sustainable solutions for resource conservation in creating low carbon society (LCS). The propose innovations will help to reduce the amount of carbon-dioxide emissions at a national level and create a road map towards a low carbon society at either a regional or city level. The propose innovations in Iskandar Malaysia (IM) is expected to be a showcase of the best practice not only for this region and this country but also for Asian regions. In order to ensure the practicability of the recommended solutions, benchmarking with world-wide and Malaysia practices should be conducted.

## OBJECTIVES

The objectives of this competition are:

- To familiarize with the concept of Low Carbon Society and eco-community.
- To differentiate different types of resource conservation efforts to reduce carbon (world wide and Malaysia scenario).
- To establish current carbon intensity in IM.
- To propose cost competitive resource conservation strategy to reduce carbon intensity in IM.
- To promote awareness in developing LCS to residential community in IM.

Instilling values and change behaviour on environmental SD



## DEADLINES

There are three stages of the contest. All contestants must go through all the three stages. All teams will go into the final round where they will compete with other contestants for the grand prize in a solid waste management Campaign Day.

- o **STAGE I: FAMILIRIZATION OF LOW CARBON SOCIETY, RESOURCE CONSERVATION AND BENCHMARKING**  
*Begins 2/10/2011; Due 15/10/2011*
- o **STAGE II: DETAIL ANALYSIS ON PARTICULAR RESOURCE CONSERVATION EFFORT**  
*Begins 23/10/2011; Due 21/11/2011*
- o **STAGE III: PROPOSE ENGINEERING SOLUTION AND**  
*Begins 23/11/2011; Due 20/12/2011*

## PROPOSAL SPECIFICATIONS

At the end of Stage III, every participating team is required to submit a comprehensive, final written proposal that should contain, but not limited to, the following items:

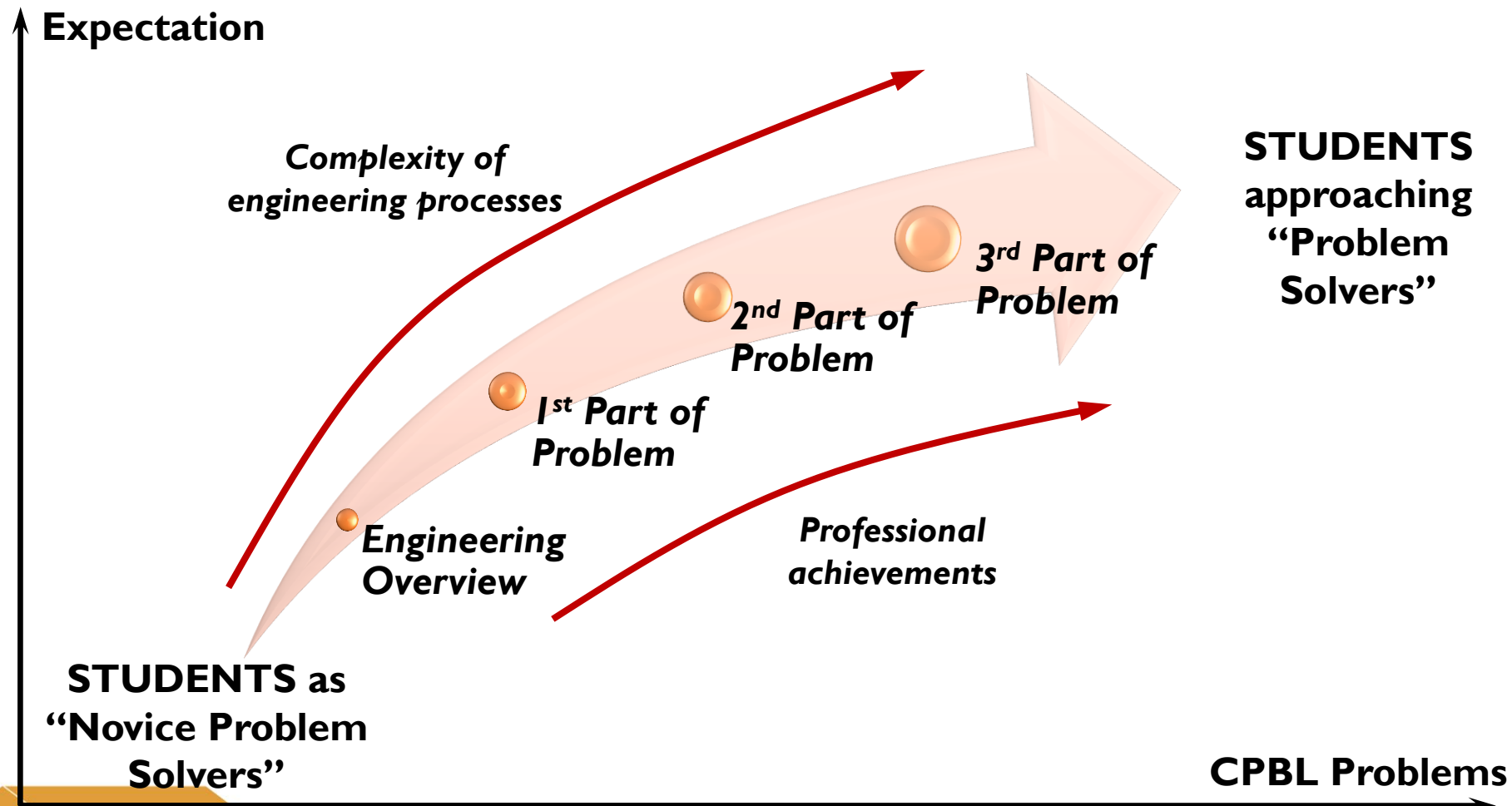
1. Perform a preliminary study on LCS and resource conservation concepts Global scenario of resource conservation efforts to reduce carbon and current residential practices worldwide and in Malaysia.
2. Propose engineering solution.
3. Perform economic analysis to find the least resource conservation strategy to reduce carbon.

To support your understanding about IM scenario, IRDA will provide you with the relevant blue print and references upon request. Winning proposals are sought for projects that are viewed to be most environmentally-sound as well as economical viable based on resource conservation concept.

## STAGE 1 SPECIFICATIONS

Participating teams are required to perform a preliminary study on LCS and resource conservation concepts to benchmark where practices in Malaysia compared to those at the international level, with particular emphasis on the current community practices, such as residential areas and schools. Information must be gathered from reliable sources and analyzed to determine current consumption habits and conservation efforts that can be used for benchmarking. You are required to submit a first stage report on Oct 15, 2012 before 5pm and present your findings to the evaluation panel in a seminar that will be held on Oct 16. Each team will be given 7 minutes to present followed by 3 minutes Q&A session.

## SDG-based problems for an Introduction to Engineering course since 2005



Professional skills	Reflective journal	Example of quotations from the reflective journals
Sustainable Development	RJ1 (Student H)	The whole process was a new experience and it was worth the time and effort we put into it. I learned that food waste was a problem to human being in term of environmental hazard and economic cost. Before this, I never even care about the leftovers and did not know much on it, but now I know that it can even be turn into a sellable products.
	RJ2 (Student H)	I can see what is going on with food waste in Malaysia and other countries. Malaysia does not have proper food waste management and it could be problematic if no solution that need to be taken seriously. So from here, I learned that if I not start to life in sustainability from now, it could affect country because the country only can be changed with the citizens' behaviors.
	RJ3 (Student H)	Before this assignment, I never realize that the amount of food waste that us as humankind produced is in so enormous amount about 670 million tonnes of food wasted annually. This shows that we didn't really appreciate the value of food and the importance of food. The current food waste generation habits that include over-buying and don't use up the leftovers mainly contribute to this problem worldwide.

# Developing PS Skills

Reflective Journal 1 (S3)	It is a big pressure for me to handle as it is not a thing that I really familiar with. We have to face the first stage of this PBL that involved a lot of group discussion, completing the report and presentation.
Reflective Journal 2 (S3)	I have to do a lot of research in order to get ideas on how to conserve energy in school. This is very stressful moment for me as the number of tasks to be completed was increased.
Reflective Journal 3 (S3)	Honestly, I am very happy with the report as each of us gives full commitment to complete it. All these work are not easy as abc as each of us need to brainstorm like a half dead person to come out with a good report. However, it taught me to be patient and don't give up even though the challenges are big.





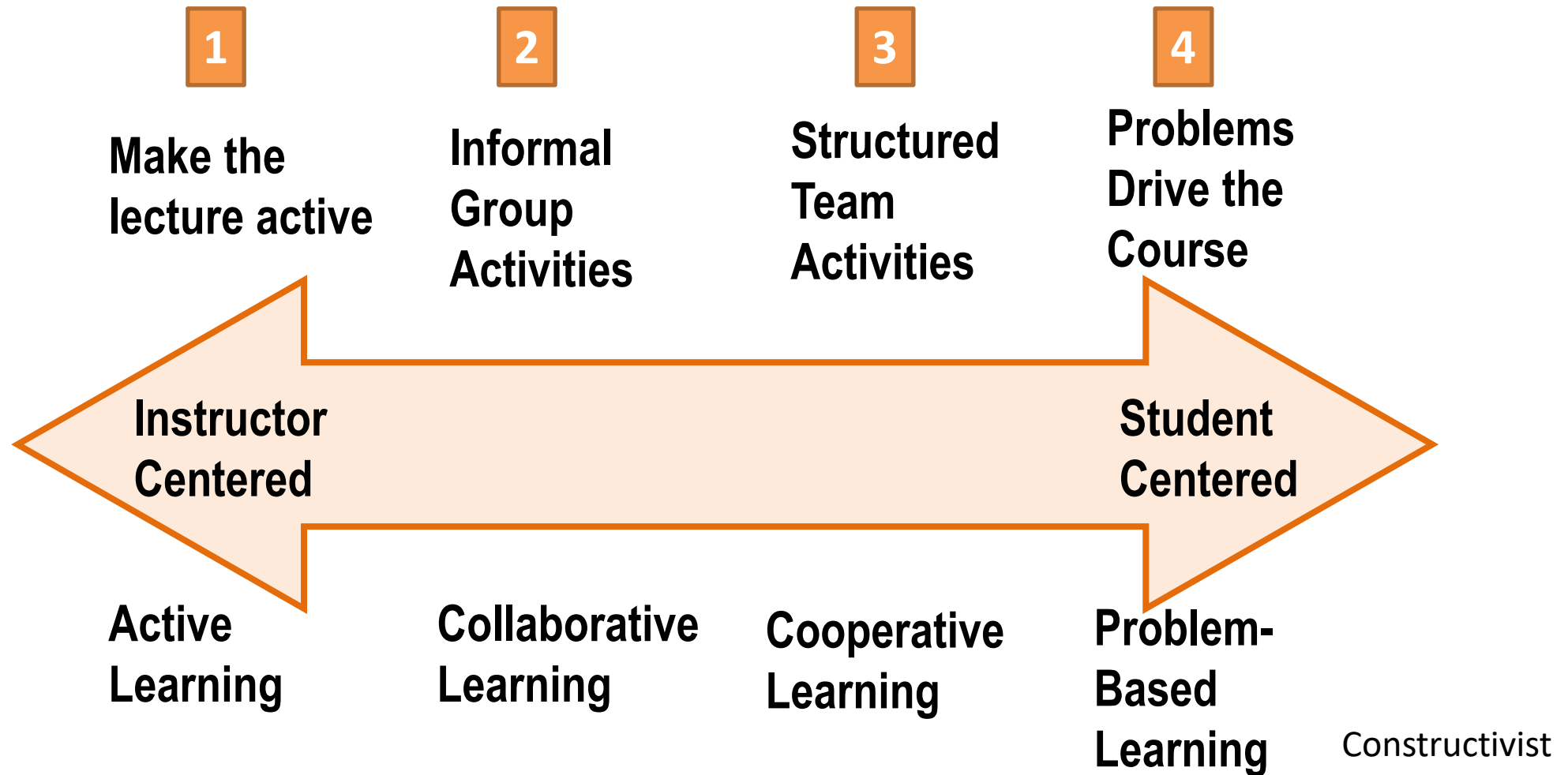
Skudai River:  
23 tons/day of  
municipal waste

# Outline

- Background: The status quo...
- Problem-Based Learning: Why and what?
- The problems in PBL
- Scaffolding for learning in PBL: Cooperative Problem-Based Learning (CPBL)
- **On becoming a PBL practitioner...**



# The Active Learning Continuum



# Student A: Feedback on PBL given to Strobel (2008)

Actually **I don't like**. PBL but in reality PBL helps me a lot. It really helps me a lot to **learn new skills**. Using PBL need more effort and **be more independent** person. If before this, lecture always gives us everything, but using PBL, we need to be more independent to **find out what we need to learn**. In this class, we are given a case study. To solve the case study, we need to find out learning issue that we must **learn by our self** and work with the content that we have to **solve the problem**. Using PBL student **becomes an active learner**. Using PBL also can improve our **communication skills**. In PBL we need to **work with our teammates**. Sometimes when we may not understand something, but teammates can helps us in understand better. We can try to solve the case study together. Doing our case study, we need to **cooperate with each other**.. PBL make me talk more during **discussion and giving my opinion**. What I can say is, **PBL helps me a lot**.

## Reflection on Implementing PBL

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Be sincere – a test of sincerity because of initial resistance, detractors and work involved

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Need to embrace constructivism as a teaching philosophy

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Student centric – what helps students to learn, not what is easy

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Be open – listen and talk to others in the field

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Implement PBL in own life – be self-directed, reflective learner!

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Collaborate – especially those with different expertise

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# Coping with change – lecturers may also go through the trauma cycle!!

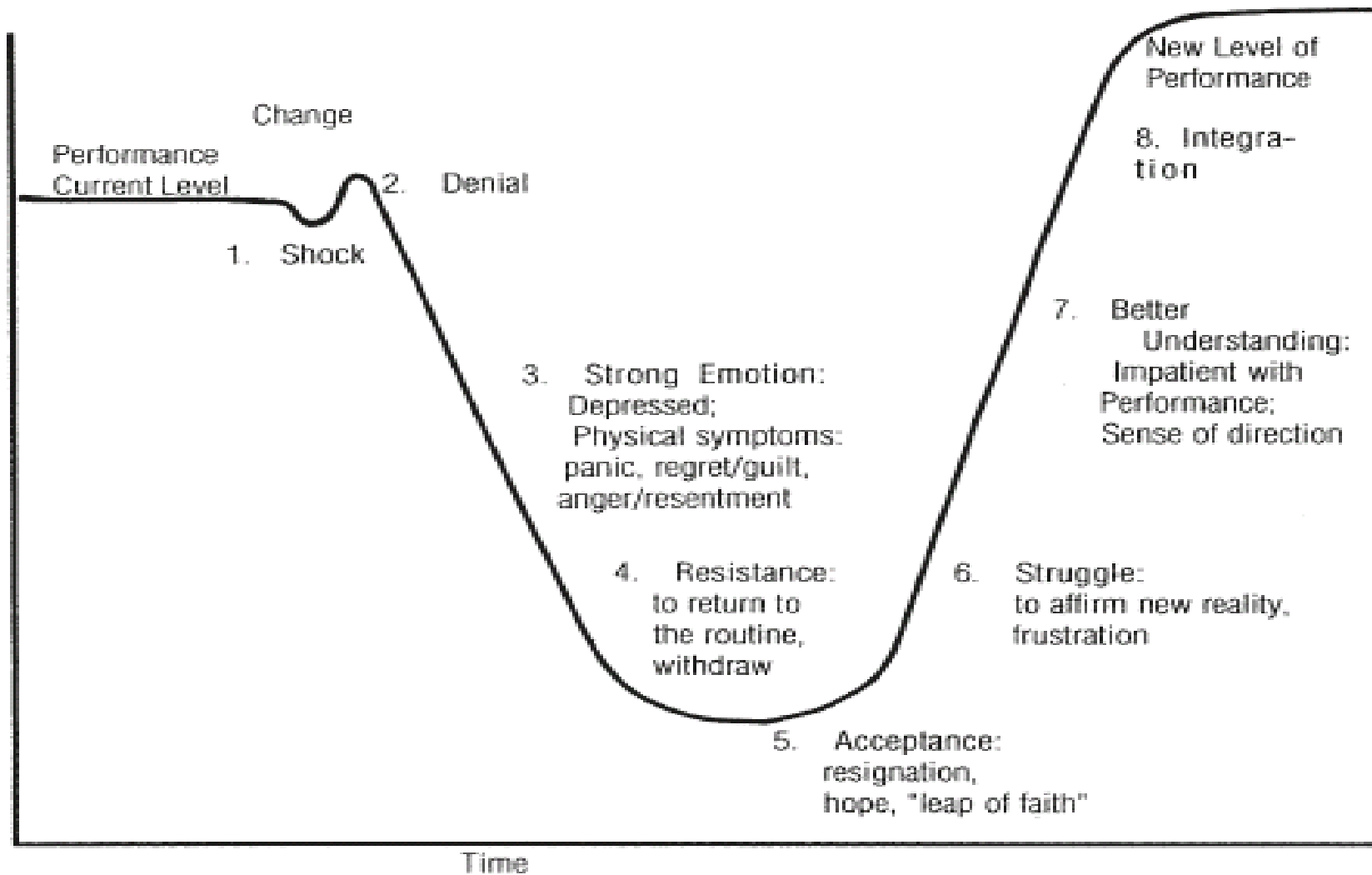
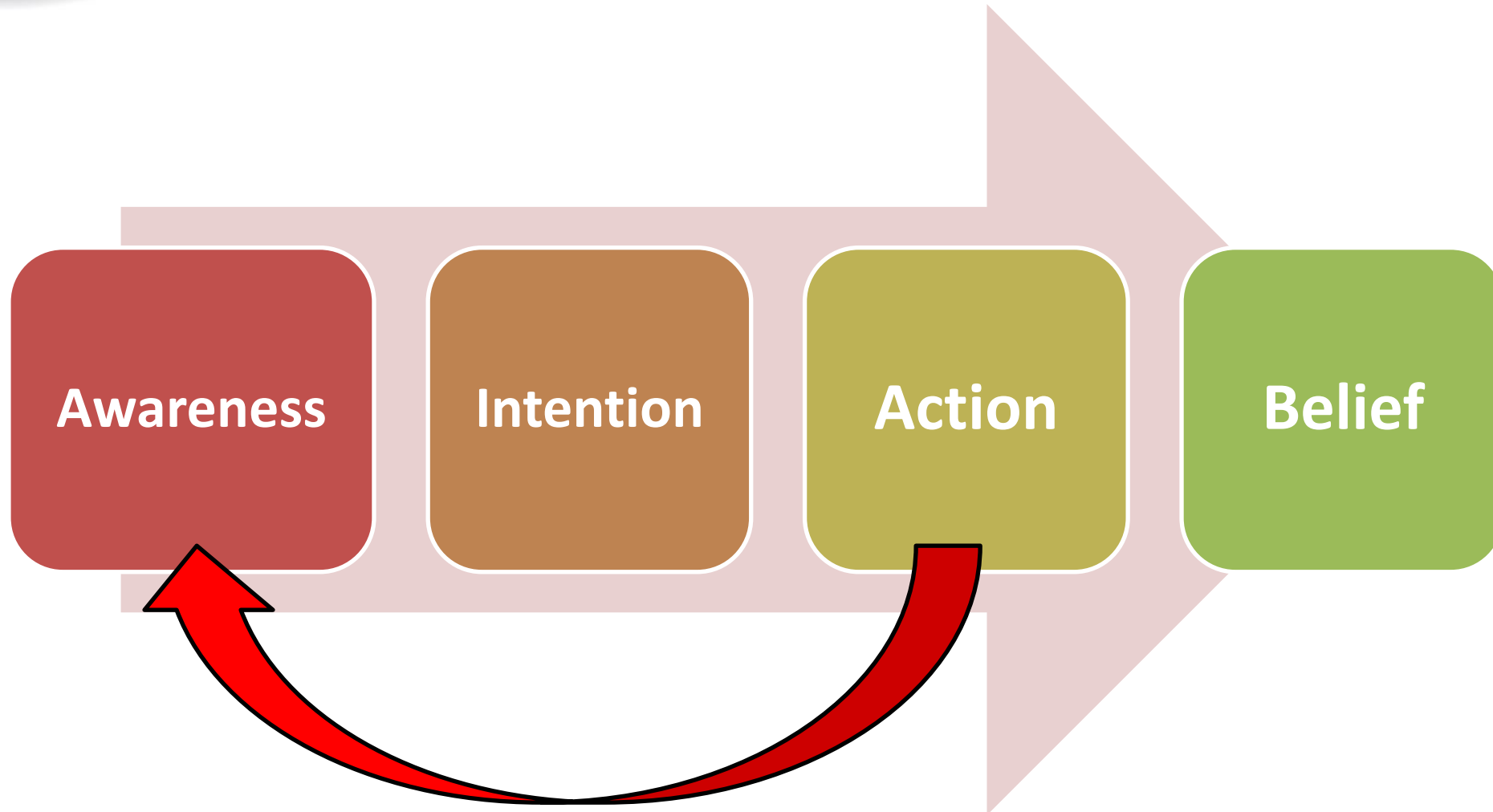


Figure 1-1 The *grieving* process as a model of how we cope with change

Woods, 1994

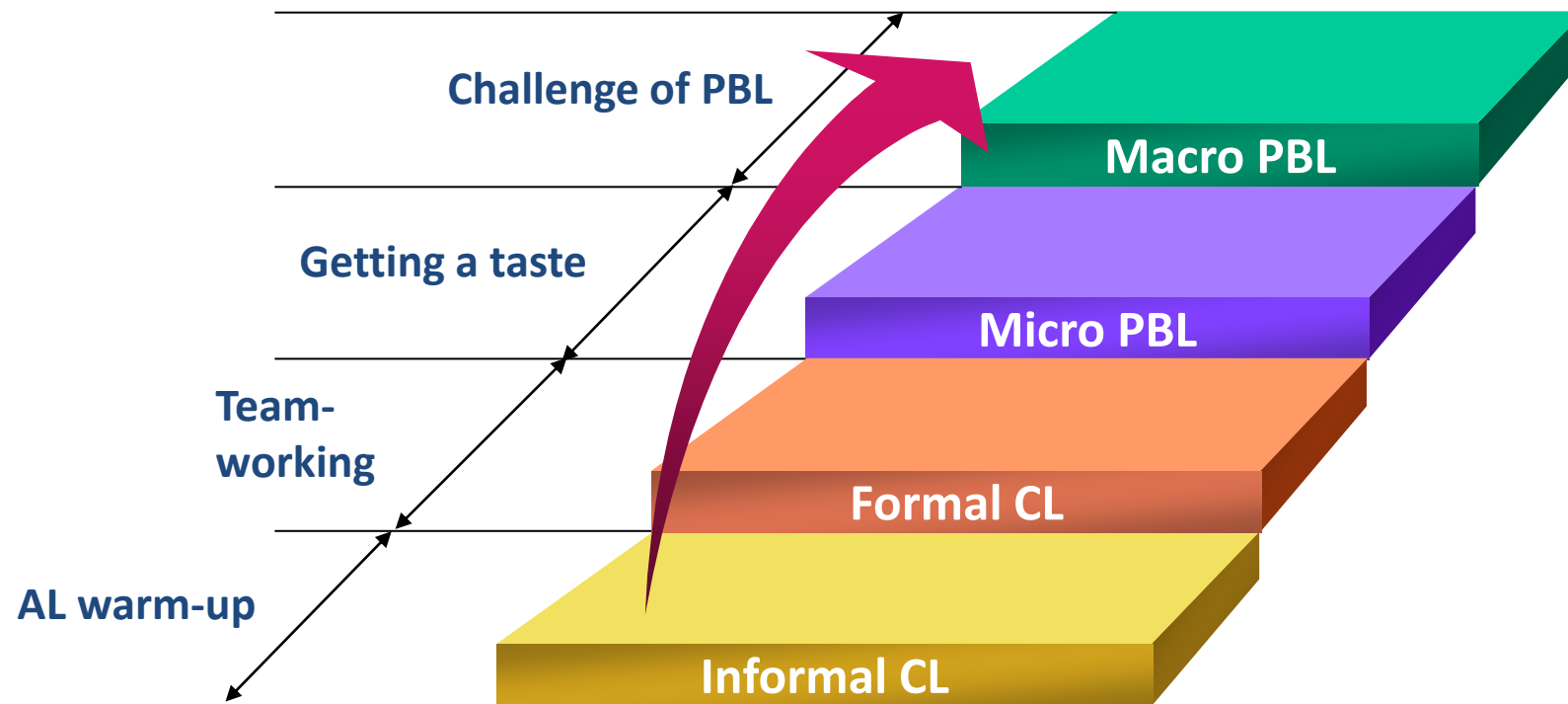
Reproduced from "Problem-based Learning: How to Gain the Most from PBL" with permission, Donald R. Woods, © 1994

# Research: Shift from Teacher Centered to Student Centered



# Gradual move in SCL techniques ...

If unfamiliar with student-centered learning techniques, start gradually



Need to go for training & embrace lifelong learning!

## 21st-Century Skills

### Foundational Literacies

How students apply core skills to everyday tasks



1. Literacy



2. Numeracy



3. Scientific literacy



4. ICT literacy



5. Financial literacy



6. Cultural and civic literacy

### Competencies

How students approach complex challenges



7. Critical thinking/ problem-solving



8. Creativity



9. Communication



10. Collaboration

### Character Qualities

How students approach their changing environment



11. Curiosity



12. Initiative



13. Persistence/ grit



14. Adaptability



15. Leadership



16. Social and cultural awareness

## Lifelong Learning



# Sustaining academic change – tips for the champion

Learn – read and  
go for training

Take scholarly  
approach

Give seminars and  
training – take the  
lead

Write and publish  
– reflective  
practitioner

Be part of the  
community – local  
and global

Understand the  
system and make  
the best of it

**Have a clear MISSION and be sincere in INTENTION**

# 21<sup>st</sup> century educator



Learner focused educator – what helps learners to meaningfully learn, eg: being guide by the side rather than sage on the stage



Learning environment designer – effective learning environment (HPL)



Team player – work together for meaningful, systemic implementation and as part of a community



Lifelong learner – the only constant is change

A nighttime photograph of the Kuala Lumpur skyline, with the Petronas Twin Towers as the central focus. The towers are brightly lit and stand out against a dark sky with some clouds. Other skyscrapers are visible in the background and foreground, some also illuminated. A semi-transparent white circle is overlaid on the right side of the image, containing the text.

Thank you

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