KAEDAH & TEKNIK SIMULASI P&P *dalam* PROGRAM KEJURUTERAAN DAN TEKNOLOGI

DR ZAKIAH ABD HALIM
FAKULTI KEJURUTERAAN MEKANIKAL

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Dr Zakiah Abd Halim

Non-Destructive Testing & Structural Health Integrity

Certified Ultrasonic Tester Level 1 (Plate thickness)

Certified Ultrasonic Tester Level 2 (Plate and pipe butt weld)

Apple Teacher

LIVELY CLASSROOM

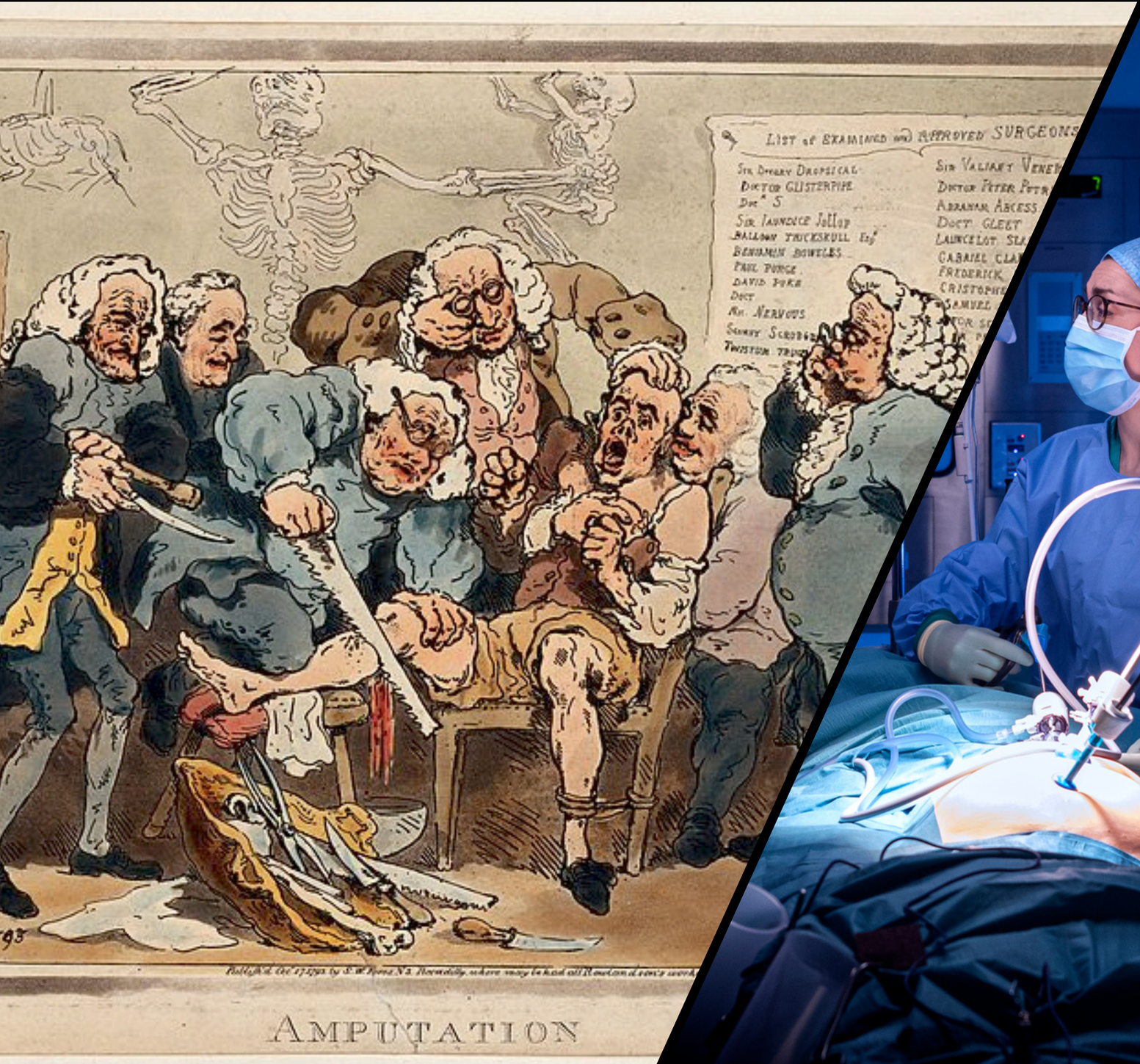
ONLINE TOOLS

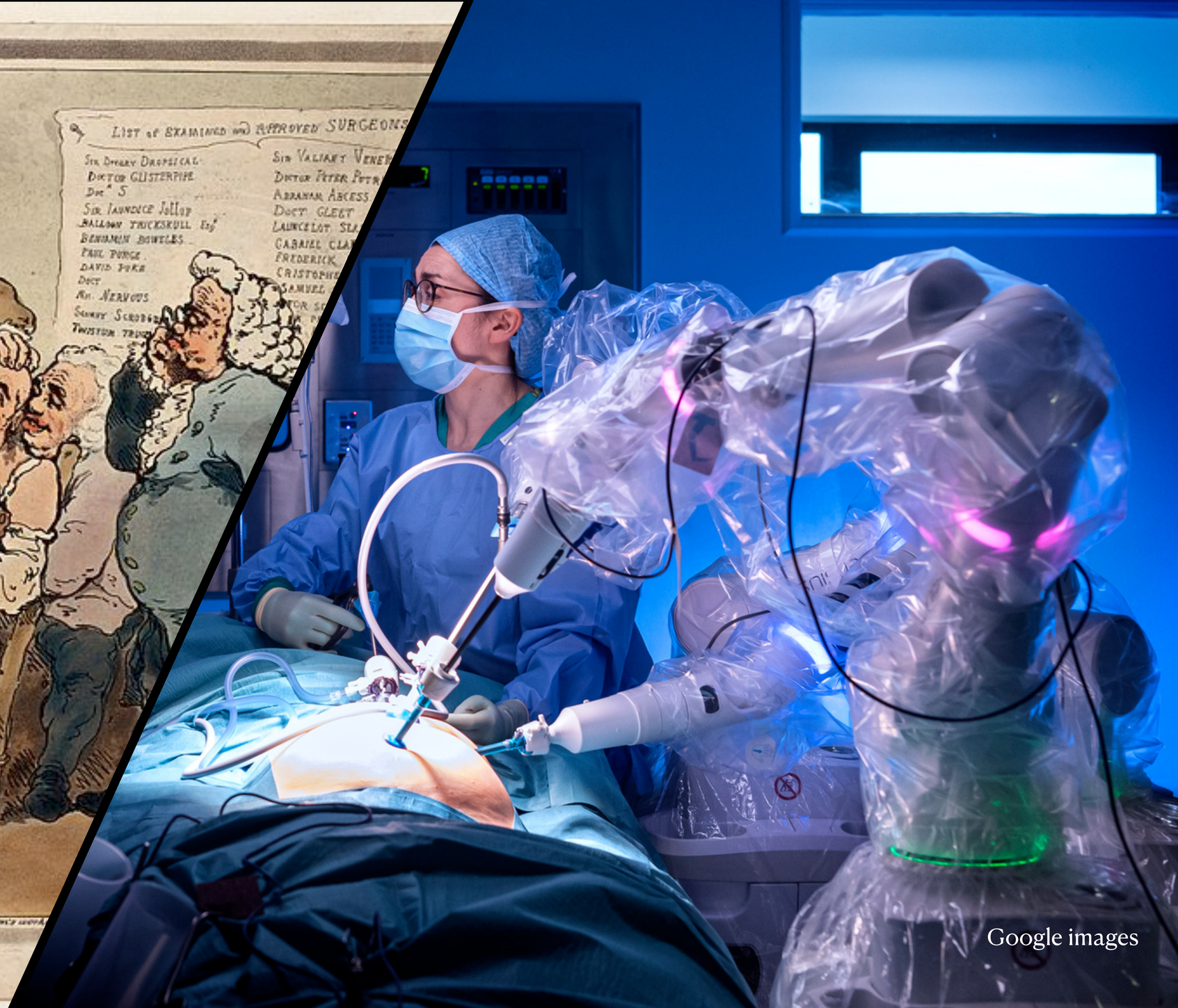
LABORATORY

https://padlet.com/ahzakiah/ot96gy2n1wpl9smc

Let’s selfie!

Medical revolution



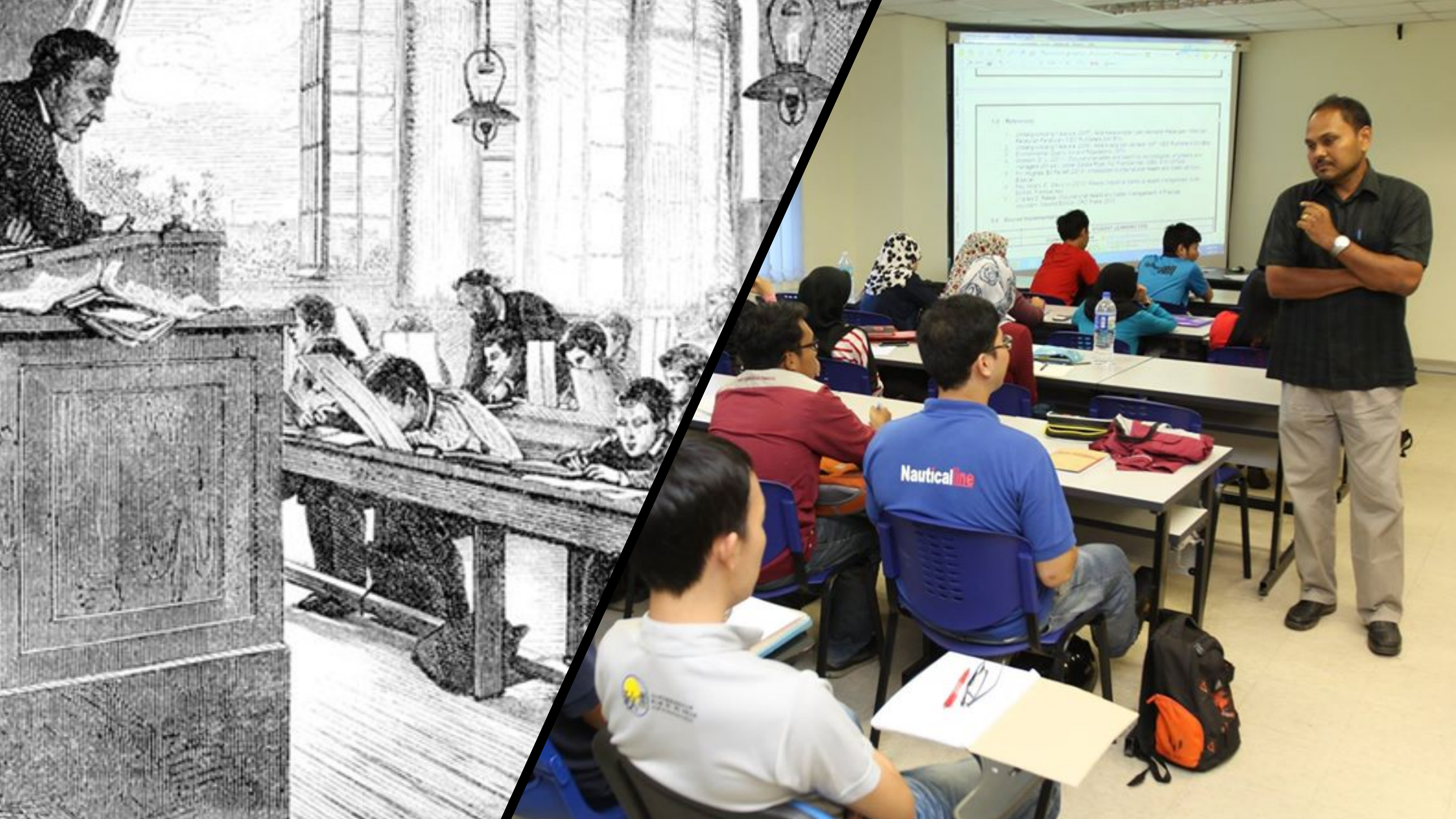


Google images

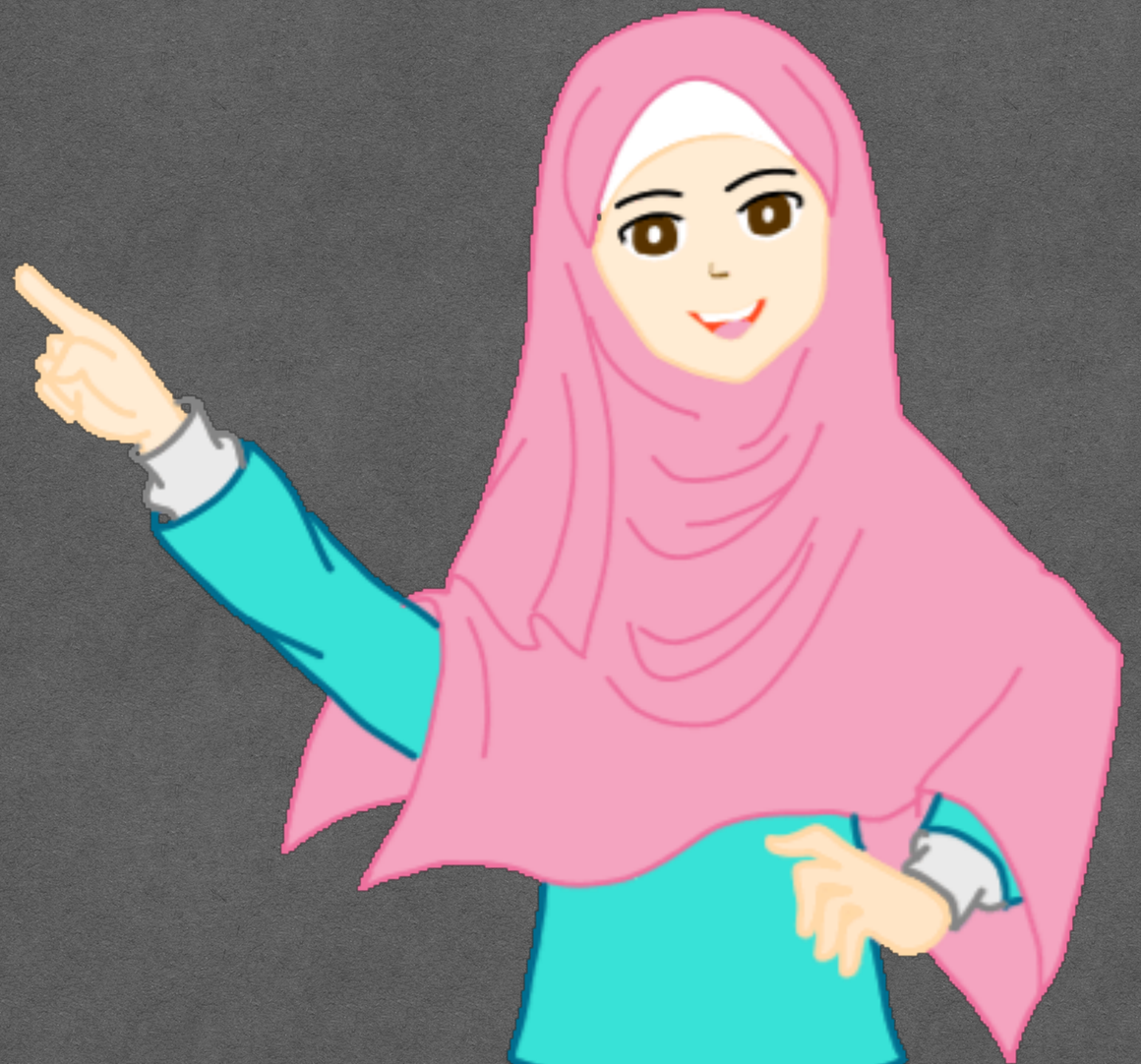
Industrial revolution

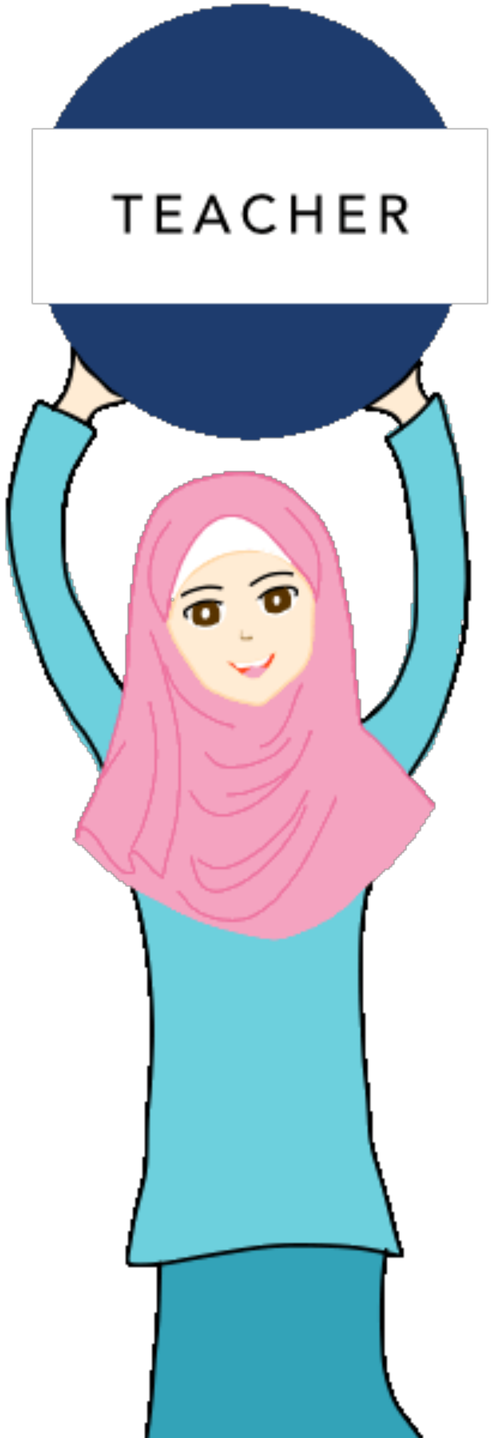
跃薪智能

Education revolution

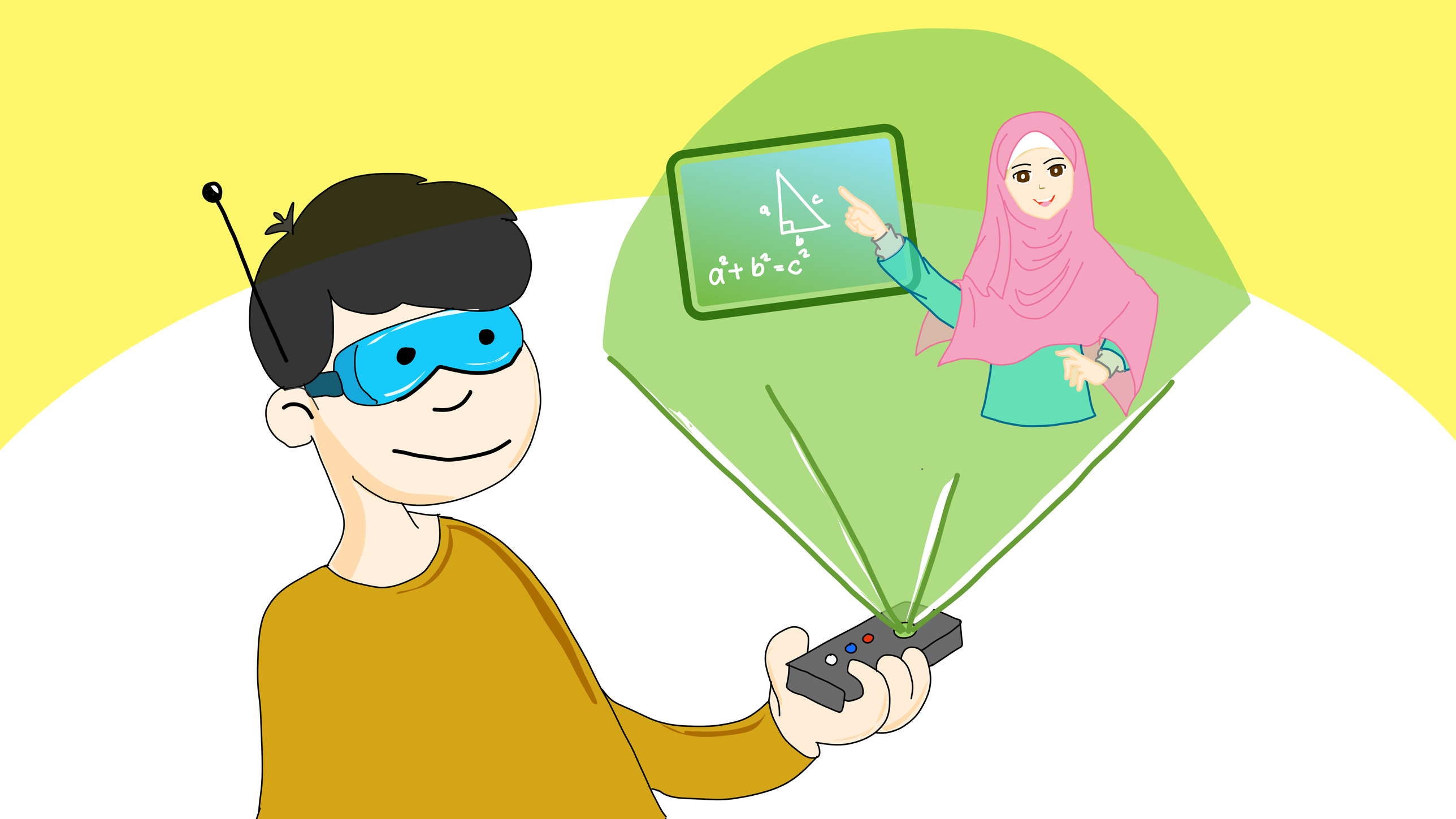

Nautical line

ROLES AS AN EDUCATOR




TEACHER

Future of education?


a
c
b
$a^2+b^2=c^2$

youtu.be/vZ0jhreixp8

Rejuvenating teaching
Inspiring learning

Rethinking teaching
Redesign learning

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Contoh Aktiviti Pengajaran

Aktiviti Pelajar

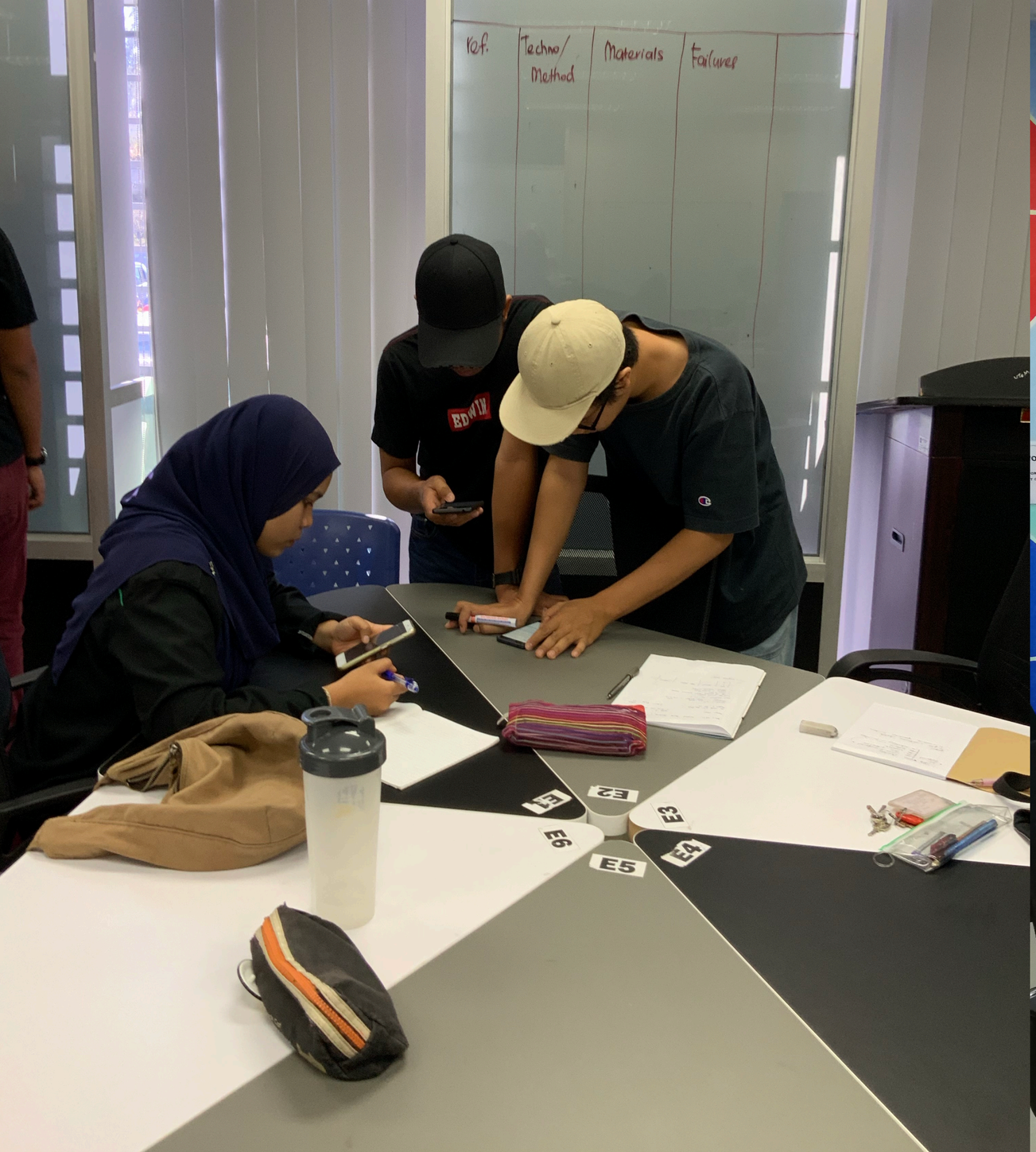
Dr Zakiah Abd Halim

Fakulti Kejuruteraan Mekanikal

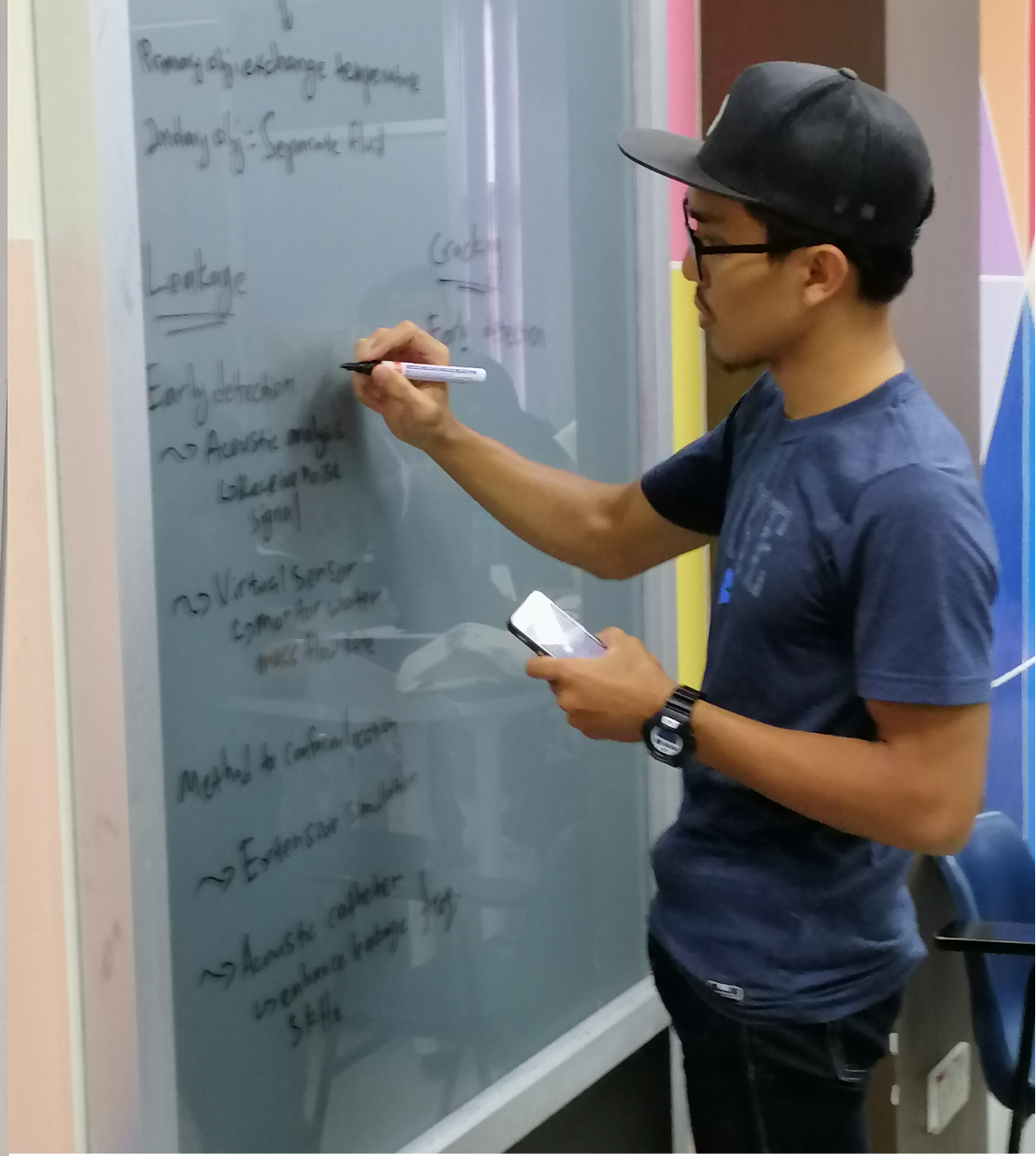
NYC
1999

Corrosion-cracking
Early detection :
Method to confirm location :

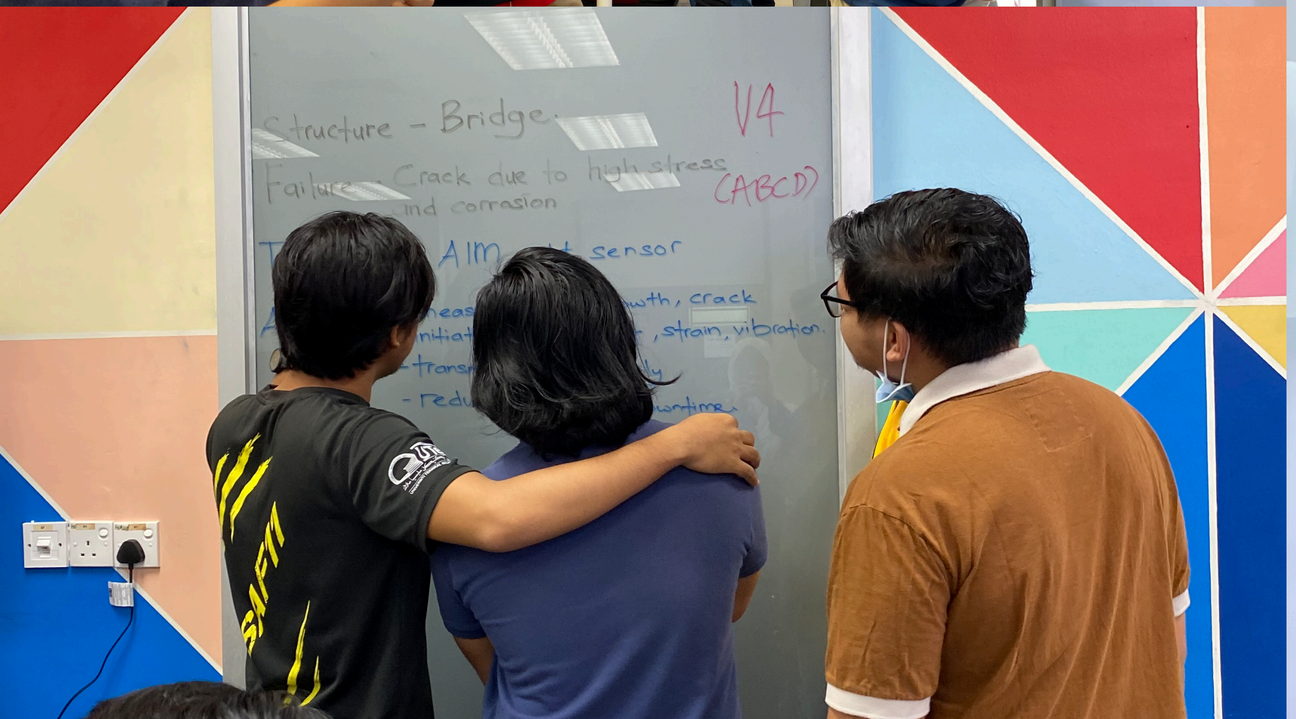
PASSWORD WIFI


Ref.
Techno/ Method
Materials
Failures
E1
E2
E3
E4
E5
E6

KELUAR


Primary obj: exchange temperature
Leakage
Early detection

KELUAR


Structure - Bridge
V4
Failure - Crack due to high stress
(ABCD)
sensor
strain, vibration
SAFETY

UTeM

DESIGN CHALLENGE

Your challenge:

Redesign

your student **experience**

in the **classroom**

DESIGN THINKING

1 UNDERSTAND

Exchange ideas to understand the context of the problem. Identify the relevant information. Brainstorming.

2 OBSERVE

Find new ideas as much as possible. Better understanding of the needs, actions, motivations, behaviours, thoughts.

3 SYNTHESIZE

Identify what is the most important needs to cater for. Evaluate the findings. Determine the relevant topics.

4 IDEATE

Develop potential ideas. Brainstorming phase.

5 PROTOTYPE

Convert the idea into prototype

6 TEST

Test your activity in terms of time, tools and effectiveness

Embrace what you don’t know, especially in the beginning, because what you don’t know can become your greatness asset..

Sara Blakely

PHASE 1

Understand

Task 1:

What are the characteristics of your dream classroom?

Mentimeter link

Time:

5 minutes

Learning Outcome 1

At the end of this session, participant should be able to:

Use **Mentimeter** as an interactive learning tool

Requirements:

Engaging

Efficient

Effective

SUCCESS

83% more effective when the assessment is delayed

CONCENTRATION SPAN

Adults: 9 minutes

DIGITAL COMPETENCIES

90% of future jobs require digital competencies

VISUALS

Visuals + text is 9% more effective than text only

MEMORY SPAN

Forgets 65% after 7 days and 90% after 6 months!

PHASE 2

Observe

DESIGN THINKING

1 UNDERSTAND

Exchange ideas to understand the context of the problem. Identify the relevant information. Brainstorming.

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3 SYNTHESIZE

Identify what is the most important needs to cater for. Evaluate the findings. Determine the relevant topics.

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Task 2:

Reflect your current teaching practice.

Time:

10 minutes

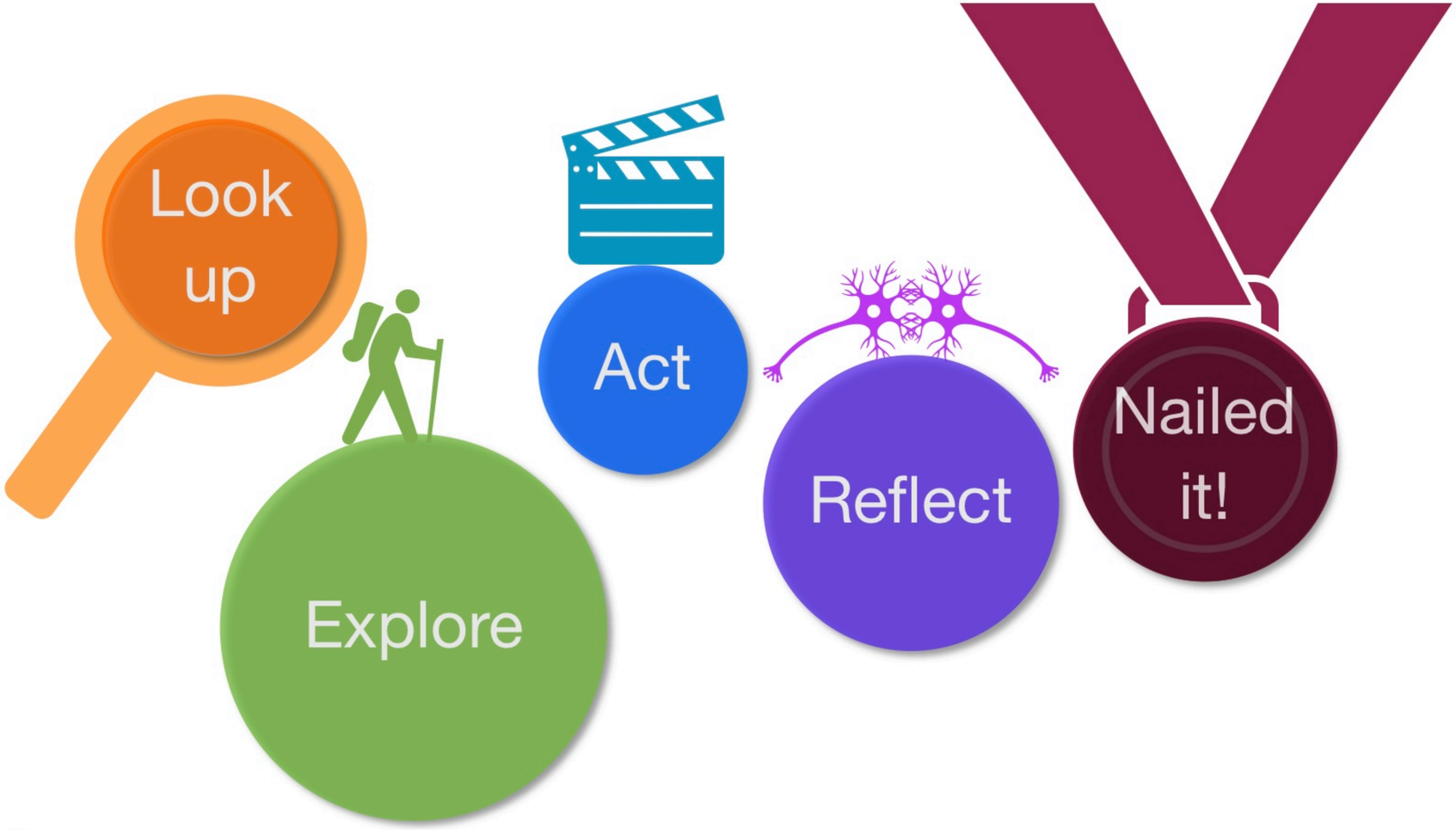
Share your STORIES..

How would you do differently?

I want my class to be Efficient, Effective, Engaging.

To make learning meaningful, I provide my students the opportunities to explore all the possibilities. When they explore all the possibilities, they manage to solve problems. When they solved problems, they acquire experience. When they acquire experience, they learn!

Hence, I redefine LEARN.



Learning Outcome 2

At the end of this session, participant should be able to:

Use **Padlet** as a powerful online discussion tool

PHASE 3

Synthesize

DESIGN THINKING

1 UNDERSTAND

Exchange ideas to understand the context of the problem. Identify the relevant information. Brainstorming.

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3 SYNTHESIZE

Identify what is the most important needs to cater for. Evaluate the findings. Determine the relevant topics.

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Test your activity in terms of time, tools and effectiveness

Learning should be fun and enjoyable.

EXPERIENTIAL LEARNING

INQUIRY BASED LEARNING

ADAPTIVE LEARNING

ACTIVE LEARNING

VIRTUAL LEARNING

COLLABORATIVE LEARNING

TEAM

Gallery walk

Task 3:

Identify the key points from the podcast.

Time: 10 minutes
+ 10 minutes

Tools: Mahjong papers and marker pens

How to build trust?

Time: 5:09 to 11:37

How to encourage students to involve at their comfort level?

Time: 13:15 to 15:16
Time: 21:08 to 22:40

How to organize your course?

Time: 16:34 to 19:39

How to create different pathways to master the learning outcome?

Time: 23:28 to 29:48

Learning Outcome 3

At the end of this session, participant should be able to:

Use gallery walk as a powerful collaboration activity

PHASE 4

Ideate

DESIGN THINKING

1 UNDERSTAND

Exchange ideas to understand the context of the problem. Identify the relevant information. Brainstorming.

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3 SYNTHESIZE

Identify what is the most important needs to cater for. Evaluate the findings. Determine the relevant topics.

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5 PROTOTYPE

Convert the idea into prototype

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Test your activity in terms of time, tools and effectiveness

Students' Roles

Activities

Educator's Roles

Student learning

Learning Outcomes

Pedagogical Approaches

List tasks and responsibilities of learners, resource implications and time frame

Plan and list activities that are related to the pedagogical approaches

- Common engineering competencies
- Engineering behavior, skill and attitudes
- Engineering ethics
- Motivation as engineering career

List tasks and responsibilities of educators, any resource implications and time frame

Specify the learning outcomes expected from the whole embedding activities. Be specific on the competencies you want learners to develop or improve.

- Ice breaker
- Pitching
- Role play
- Debate
- Drama
- Revolving tables

- Story telling
- Case studies
- Polls
- Simulation
- Field visits

Objectives setting

Use gallery walk as a powerful collaboration activity

Performance: What the learners must know and perform

Standard: Performance indicator

Conditions: Condition in which the learners need to achieve a results

Students' Roles

- Form a group of 10
- Act as an individual atom
- Re-create the wave motion using dance formation

Activities

- Ask students to replicate the formation of different type of wave motion.
- Then they need to demonstrate the formation to justify the wave motion.

Student learning

Characteristics of wave motion

Educator's Roles

- Prepare audio
- Provide the instructions and requirements
- Set the duration of activities
- Monitor the class so that they focus
- Ask each group to show the dance formation to replicate the wave motion

Learning Outcomes

Learners can show different motion of wave using dance formation

Pedagogical Approaches

Dancing

Students' Roles

- Form a group of 4
- Play games 10 min per student

Activities

- Play games
- Explore functions tools

Educator's Roles

- Choose games
- Questions

Student learning

VR

Learning Outcomes

To understand AVR input output device

Pedagogical Approaches

Gallery walk

Task 4:

Suggest 1 activity to encourage students participation

Time: 10 minutes

Tools: Mahjong papers and marker pens

Criteria:

Easy

Effective

Impactful

Free tool(s)

Learning Outcome 4

At the end of this session, participant should be able to:

Use **Learning Model Canvas** as a brainstorming tool

PHASE 5

Prototype

DESIGN THINKING

1 UNDERSTAND

Exchange ideas to understand the context of the problem. Identify the relevant information. Brainstorming.

2 OBSERVE

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3 SYNTHESIZE

Identify what is the most important needs to cater for. Evaluate the findings. Determine the relevant topics.

4 IDEATE

Develop potential ideas. Brainstorming phase.

5 PROTOTYPE

Convert the idea into prototype

6 TEST

Test your activity in terms of time, tools and effectiveness

Task 5:

Create a flow of activity for your classroom

Time: 10 minutes

Learning Outcome 5

At the end of this session, participant should be able to:

Create an activity to be used in the classroom

PHASE 6

Test

DESIGN THINKING

1 UNDERSTAND

Exchange ideas to understand the context of the problem. Identify the relevant information. Brainstorming.

2 OBSERVE

Find new ideas as much as possible. Better understanding of the needs, actions, motivations, behaviours, thoughts.

3 SYNTHESIZE

Identify what is the most important needs to cater for. Evaluate the findings. Determine the relevant topics.

4 IDEATE

Develop potential ideas. Brainstorming phase.

5 PROTOTYPE

Convert the idea into prototype

6 TEST

Test your activity in terms of time, tools and effectiveness

Task 6:

Test your activity!

Time: 10 minutes

Learning Outcome 6

At the end of this session, participant should be able to:

Test the activity designed for the classroom

SHM Feedback

Statistics Feed Forward

Reflection

Task 7:

Pick a topic and explain in 1 minute. Step to the right after 1 minute has passed.

Time:
10 minutes

Learning Outcome 7

At the end of this session, participant should be able to:

Use speed dating as an effective reinforcement activity

Lab Instruction

www.youtube.com/watch?v=GUhqoev_uqQ

www.youtube.com/watch?v=y2EXRxkE6ew

Plant Inspector

feedback

Share your thoughts..

Tips for CLASS ACTIVITIES

Plan AHEAD!

	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8	Session 9
Phase	Introduction	Design Challenge	Understanding	Observation	Synthesize	Ideate	Prototype	Test	Reflection
Activity	Compilation Of Students Activities	Creating Design Challenges	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
Objectives		Methods Of Engaging Students In A Classroom	Test The Understanding	Reflect Your Current Teaching Practice	Need Analisis	Design 1 Engaging Class Activity	Create The Class Activity	Test The Class Activity	Reinforcement
Duration	15 Min	10 Min	5 Min	10 Min	20 Min	10 Min	10 Min	10 Min	5 Min
Tools/ Method			Mentimeter	Padlet	Podcast, Mahjong Paper, Marker, Tape	Mahjong Paper, Marker, Tape	Any Tools	Any Tools	Speed Dating
Question		Redesign The Student Experience In Your Classroom	What are the characteristics of your dream classroom?	How Would You Do Differently?	Keypoints From Podcast	Suggest 1 Activity To Encourage Students Participation	Create Activity For The Students	Tests The Activity	Share 1 Topic

Timing!

Include EVERYONE

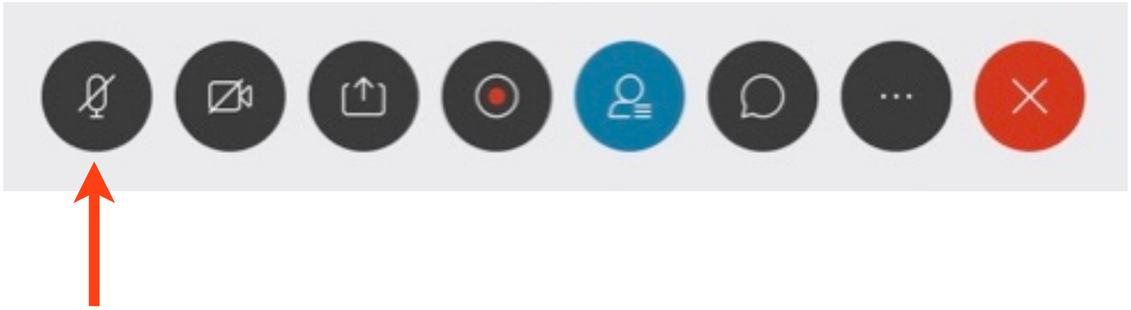
Feedback

Reflection

Extra tips

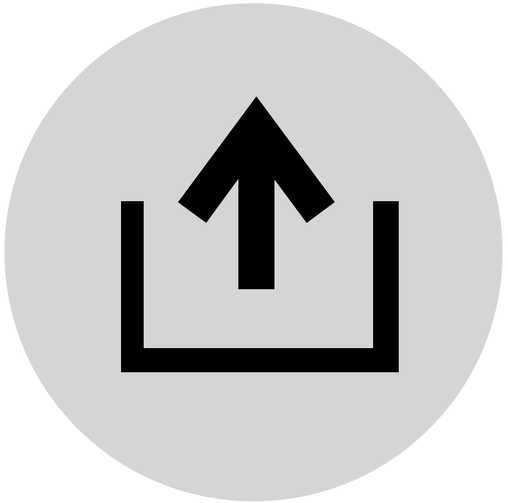
Tips for ONLINE LEARNING

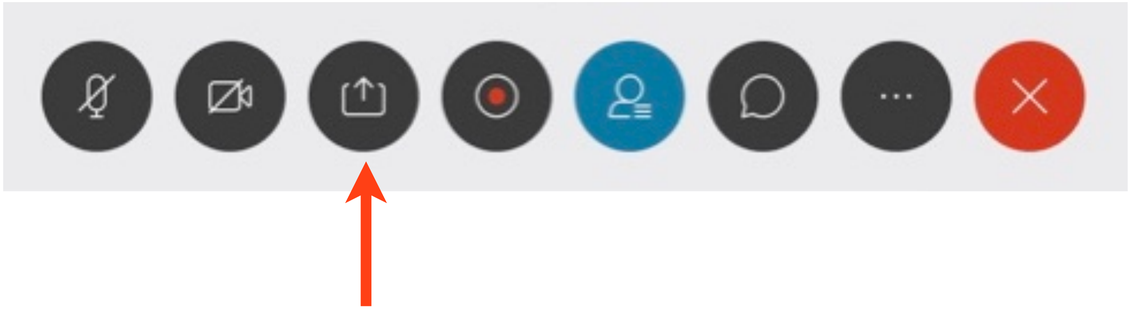
AUDIO SETTING



Mute your microphone

SHARING SCREEN

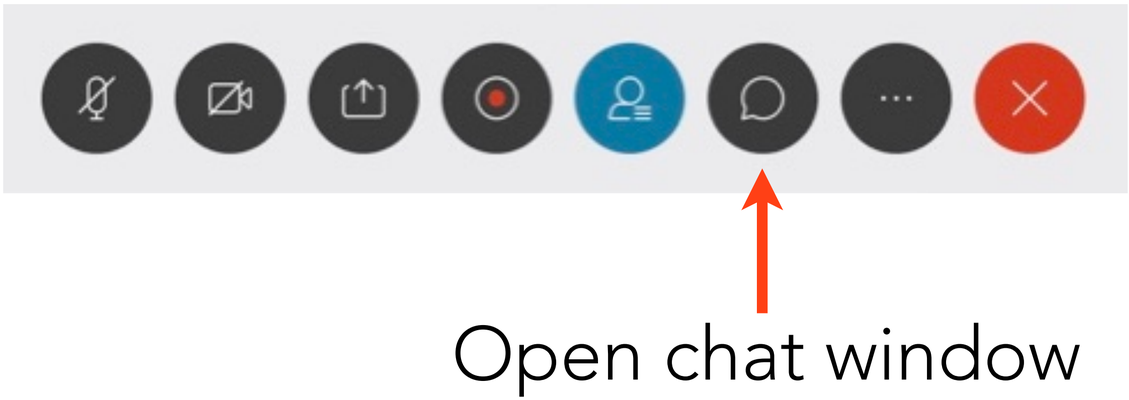




Share your screen.

QUESTIONS?

Ask questions using the chat feature.



Open chat window

CONGRATULATIONS!!!