Session 3: Gap Analysis – 20 to 24: Transitioning Period

Session 1: Understanding Gap Analysis

Session 2: Best Practices in Carrying out Gap Analysis for IHL

Presenters

Ir. Prof. Dr. Che Maznah Mat Isa

EAC Associate Director (Civil Engineering)

Ir. Prof. Law Chung Lim

EAC Associate Director (Chemical Engineering

Date: 01 November 2023
Venue: Zoom

Learning Outcomes

At the end of Session 1, the participants should be able to:

- Define gap analysis
- Identify the important & critical areas that need to be compared between the 20 and 24 standards
- Examine the criteria/requirements that involve changes, omits requirements, or modifies existing criteria in the 24 standard.
- Evaluate the current programme against the 24 standard - Compliant, Partially Compliant or Non-Compliant
- Carry out the constructive alignment – courses (breadth and depth), instructional method and assessment tools

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Gap Analysis (GA)

Gap analysis is a **strategic assessment process** that involves **comparing and evaluating the differences** between the current state of a standard (**EAC Standard 2020**) in the program(the "as-is" state) and a desired future state or a set of standards or requirements **(EAC Standard 2024** (the "to-be" state).

GA is commonly used in educational program transitions, to facilitate decision-making, planning, and improvement.

How to carry out GA for your progamme?

Clearly define the **specific standards or requirements** of the **20 and 24 standards** and understand what is expected in each for example, **12PO reduced to 11POs (PO7 included in the new PO6 – Engineers and the World)**

Gather data and documentation related to your existing program, **including course materials, syllabi, teaching methods, assessment practices, and any relevant program information.**

Evaluate your current educational program against the **24 standard's** requirements. Categorize each criterion as "**Compliant," "Partially Compliant," or "Non-Compliant**" to assess your program's alignment with the **24 standard**.

Determine the critical areas that need to be compared between the **20 and 24 standards**. These areas may include **curriculum content, assessment methods, program outcomes, and any other relevant criteria**.

Conduct a side-by-side comparison of the **20 and 24 standards**, **examining each criterion or requirement to understand the differences** between them.

Note where the new standard introduces **changes** (PO statement & knowledge profiles, WP&EA), **omits requirements (PO7 – Environment & Sustainability**), additional criteria **(WK5 – knowledge on efficient resource use, environmental impacts ..to support engineering design & operations,** WK9 – Ethics, Inclusive Behavior & Professional Conduct) **or modifies existing criteria (**WK8 in Lifelong Learning & critical thinking, emerging issues**), SDGs, WP & EA)**

Implementation and documentation during the transitioning period

For areas where your program is "Partially Compliant" or "Non-Compliant," identify specific gaps or differences between the **20 and 24 standards**. Determine which elements or practices need **modification or improvement.**

Use a systematic approach to evaluate and compare each criterion (OBE, Academic Curriculum, Students, Staff, Facilities & QMS) or KPI between the **20 and 24 standards.**

Begin implementing the changes outlined in your action plan. Ensure that all stakeholders (faculty, external stakeholders – IAP/EE) are informed and provided with the resources and training required for the transition.

Continuously monitor your program's progress in meeting the new standard's requirements. Regularly report progress to relevant **accreditation bodies or stakeholders (SAR – new cycle/continuing)**.

Keep detailed records of the changes made and their impact on your program (**PO Trays/Boxes/Folders -** courses contributed to the 12POs, assessment details to support achievement of PO, other students' learning assessment activities & details, samples of students' work

Quality Assurance: Use the results of your monitoring and evaluation to **make adjustments and improvements** as needed.

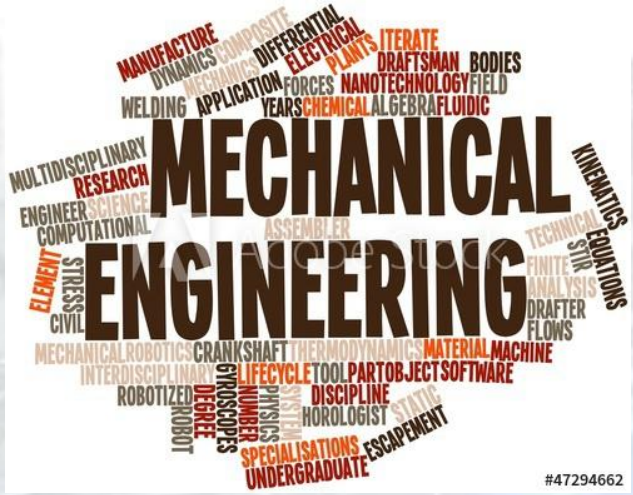
OBE/PO ASSESSMENT MODEL (11POs)

Culminating Model (Selected few courses)
Normally between 3-5 courses (final year of study)

- Integrated Design Project
- Final Year Project
- Industrial Training

Dominating Model (Selected Core Courses)

- Year 1 (if relevant)
- Year 2
- Year 3
- Year 4



Accumulating Model (All Courses)

- Year 1
- Year 2
- Year 3
- Year 4

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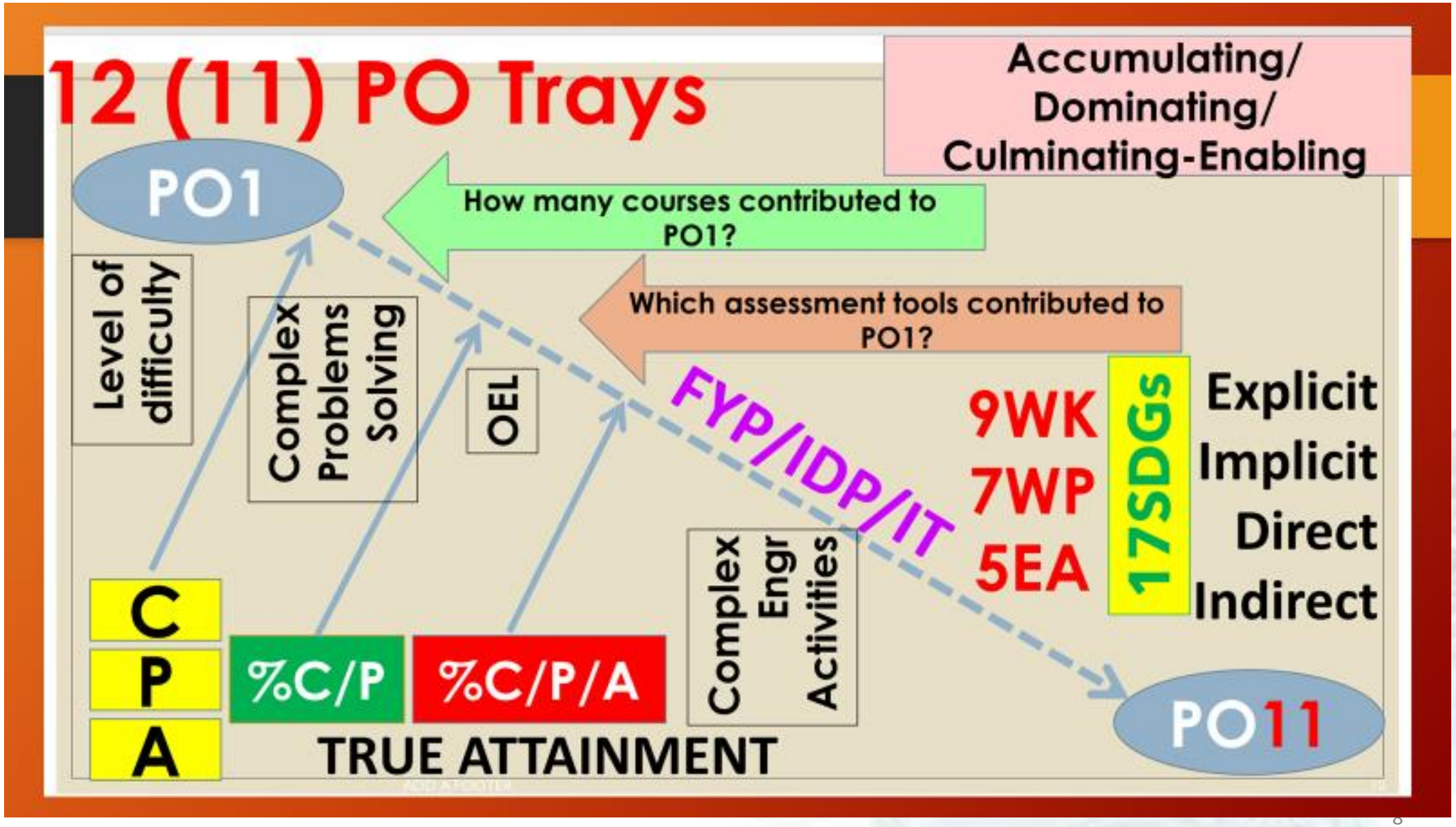
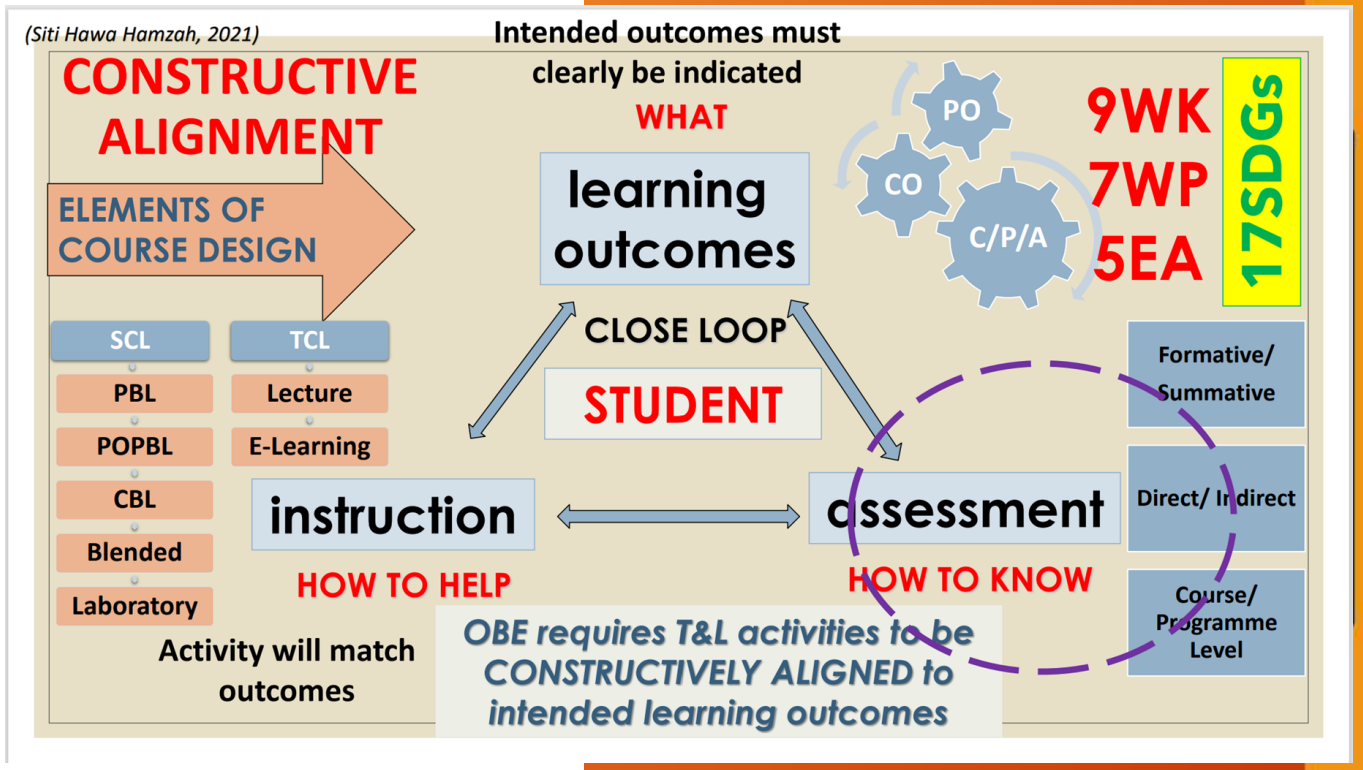
PO Trays/Boxes/Folders(11POs)



Systematic Constructive Alignment



- Course Content - Syllabus, Learning outcomes, lesson plan
- Teaching Delivery Methods - traditional, discussion, active learning, collaborative learning, etc.
- Assessment Aspects: Tools, weightage, level of difficulties, level of complexities, rubrics - descriptors, criteria

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Ir. Prof. Law Chung Lim

EAC Associate Director (Chemical Engineering)

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Learning Outcomes

At the end of Session 2, the participants should be able to:

- Know different ways in carrying out gap analysis
- Understand gap analysis through examples based on POs
- Understand gap analysis through examples based on WKs

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Gap Analysis

There are many ways in performing gap analysis – effective – convince the evaluation panel that your programme is complying with EAC Standard 2024

- SAR written by referring to Standard 2020, panel visit in Jan 2024 and onwards
- Document template / management system / software referring to Standard 2020 and 12 POs
- New changes take effect in 2024, but data was collected before 2024

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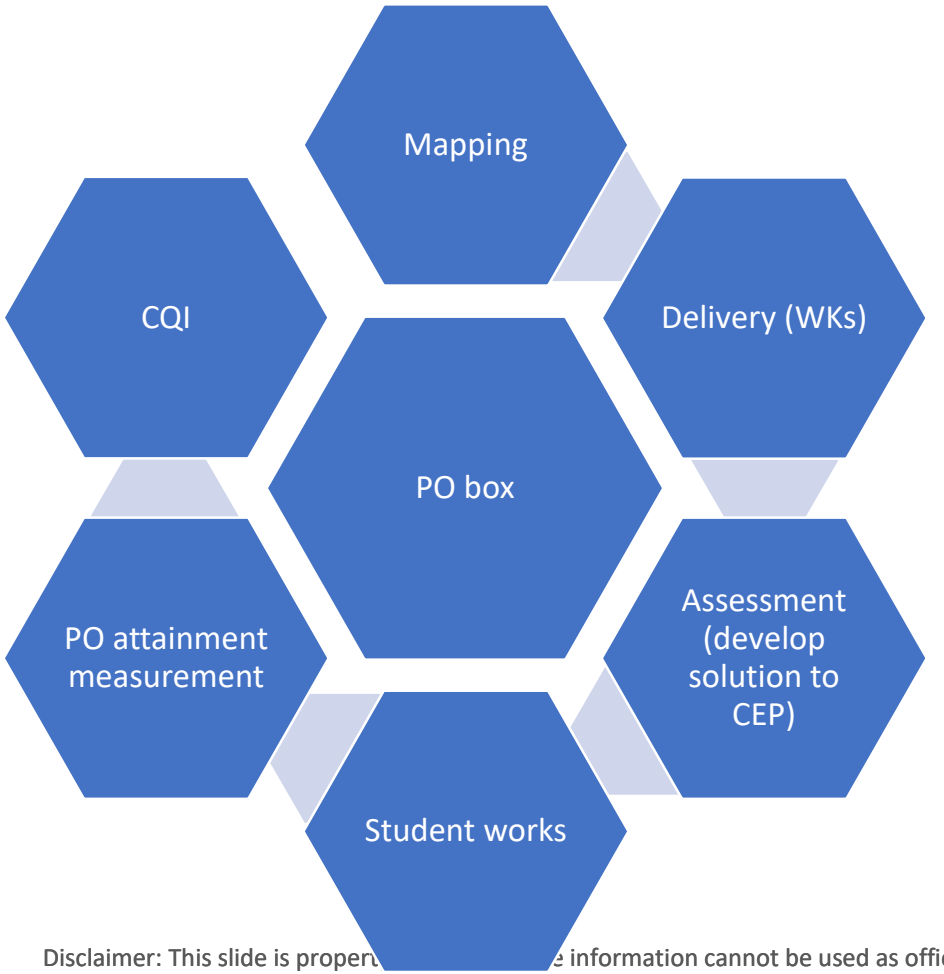
PO	PO statement
PO1	**Engineering Knowledge** - Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in WK1 to WK4 respectively to develop solutions to complex engineering problems
PO2	**Problem Analysis** - Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development (WK1 to WK4)
PO3	**Design/Development of Solutions** - Design creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required (WK5);
PO5	**Tool Usage** - Create, select and apply, and recognize limitation of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, (WK2 and WK6);
PO6	**The Engineer and the World** - Analyze and evaluate sustainable development impacts to: society, the economy, sustainability, health and safety, legal frameworks, and the environment, in solving complex engineering problems (WK1, WK5, and WK7)
PO7	**Ethics** - Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion (WK9);
PO8	**Individual and Collaborative Team Work** - Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multidisciplinary, face-to-face, remote and distributed settings (WK9);
PO9	**Communication** - Communicate effectively and inclusively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences;
PO11	**Life Long Learning** - Recognise the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change (WK8)

Gap Analysis - Examples

Engineering Knowledge - Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in WK1 to WK4 respectively to develop solutions to complex engineering problems



Mapping	Delivery	Evidence
Course - PO	Computing	Student works
Assessment - PO	Examples	Eng knowledge (WK1-4)

Student works on using Eng knowledge (WK1-4) to develop solution to CEP

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Gap Analysis - Examples

Engineering Knowledge - Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in WK1 to WK4 respectively to develop solutions to complex engineering problems

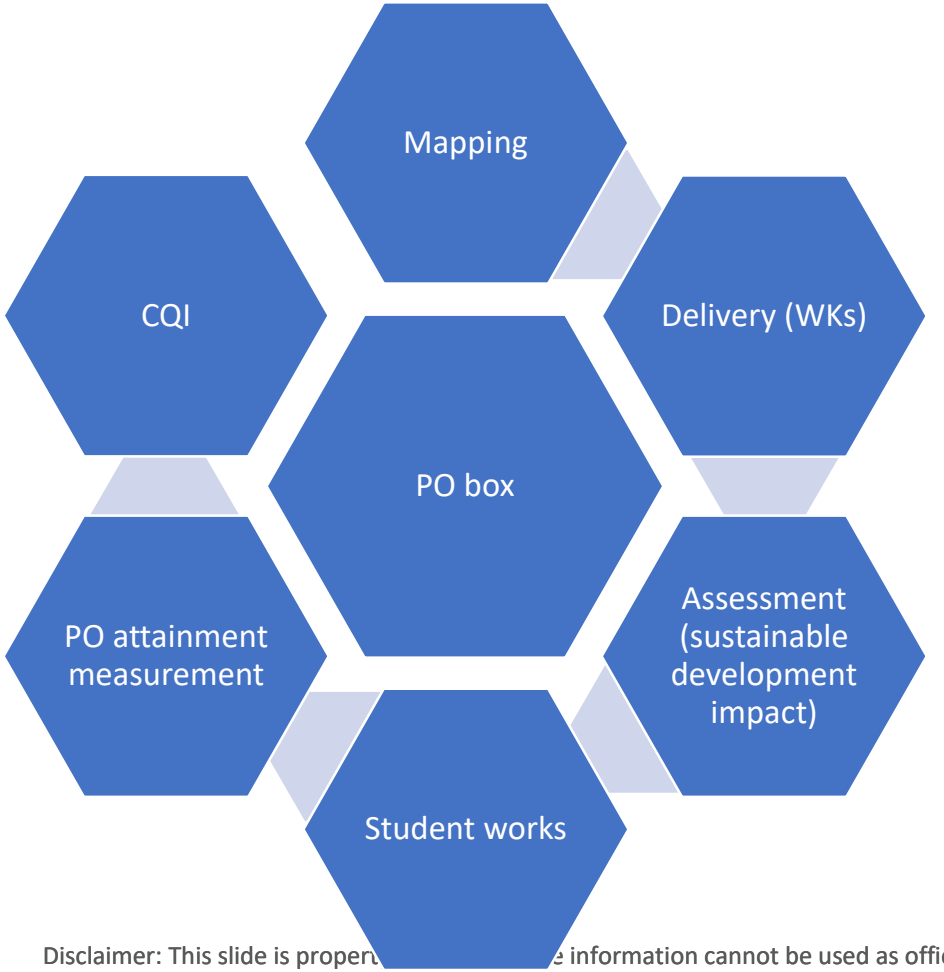
If we don't have PO box

Student works on using Eng knowledge (WK1-4) "Computing" to develop solution to CEP

SAR (2020)	PO assessment	PO attainment
Supplementary Delivery	Assessment components	Evidences
WK1 Sci WK2 Math WK3 Fundamental WK4 Specialist	PO1 elements Computing	Additional data Computing
Computing		

Gap Analysis - Examples

The Engineer and the World - Analyze and evaluate sustainable development impacts to: society, the economy, sustainability, health and safety, legal frameworks, and the environment, in solving complex engineering problems (WK1, WK5, and WK7)



Mapping	Delivery	Evidence
Course - PO	WK1 Sci, WK5 Design	Student works
Assessment to PO	Examples	PO5 elements

Student works on evaluating sustainable development impact taking into account i. society, ii. Economy, iii. Sustainability, iv. Health and safety, v. legal, vi. Environment

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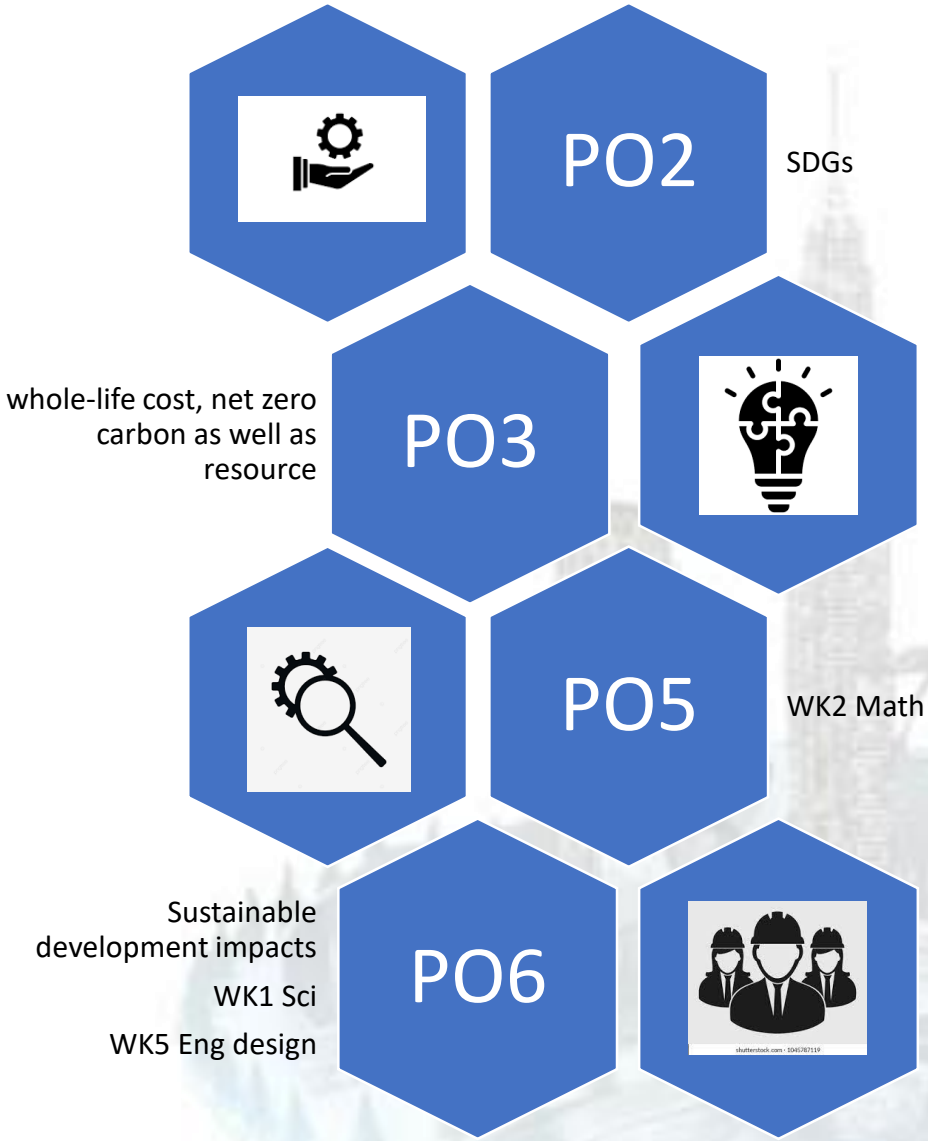
Gap Analysis - Examples

Similarly, for other POs:

- Worth noting:

- PO6 - Analyze and evaluate sustainable development impacts:

1. Society
2. Economy, sustainability
3. Health and safety
4. Legal frameworks
5. The environment



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Gap Analysis - Examples

Similarly, for other POs:

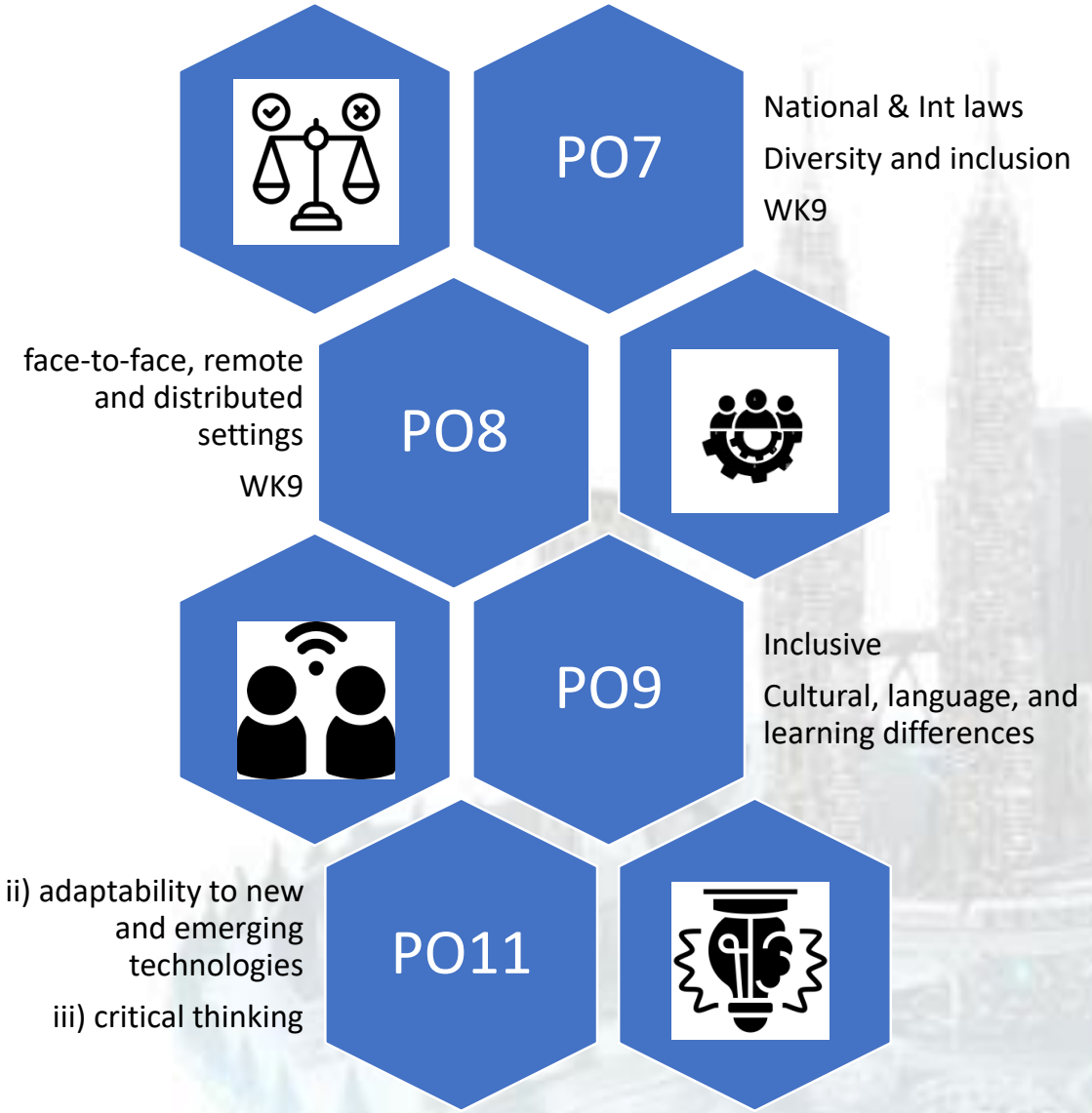
- Worth noting:

- PO9 - Inclusive:

1. Cultural
2. Language
3. Learning differences

- PO11 –

1. Adaptability
2. Critical Thinking



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Knowledge Profiles

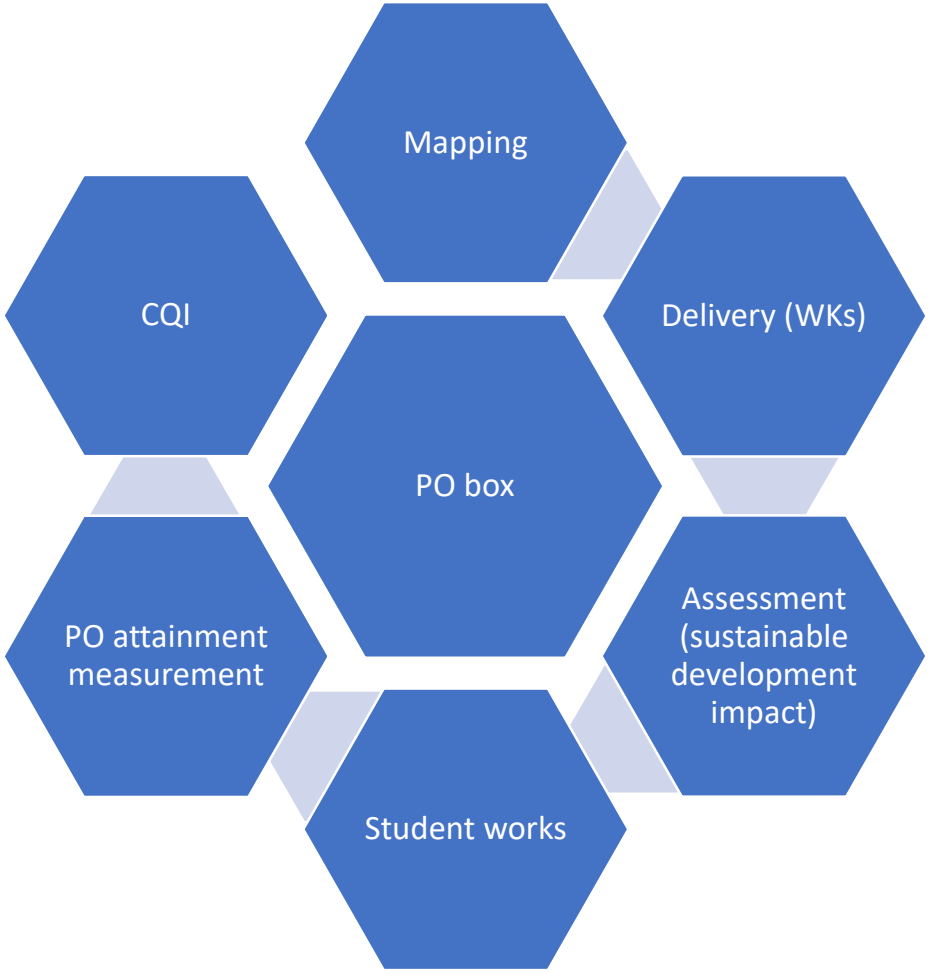
- WK1 - natural sciences
- WK2 – mathematics
- WK3 – engineering fundamentals
- WK4 – specialist knowledge
- WK5 – engineering design
- WK6 – engineering practice
- WK7 – comprehension
- WK8 – research literature

- WK1 - A systematic, theory-based understanding of the natural sciences applicable to the discipline and **awareness of relevant social sciences**
- WK5 - Knowledge, including **efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon**, and similar concepts, that supports engineering design and operations in a practice area
- WK8: Engagement with selected knowledge in the current research literature of the discipline, **awareness of the power of critical thinking and creative approaches to evaluate emerging issues**
- WK9: **Ethics, inclusive behavior and conduct**. Knowledge of **professional ethics, responsibilities, and norms of engineering practice**. Awareness of the need for diversity by reason of **ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes**

Gap Analysis - Examples

WK1 - A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences

- Where do we cover WK1? (PO1 Eng knowledge, PO2 Problem analysis)



Mapping	Delivery	Evidence
PO1, PO2	Which courses	Student works
Topics covered	Examples	Examples

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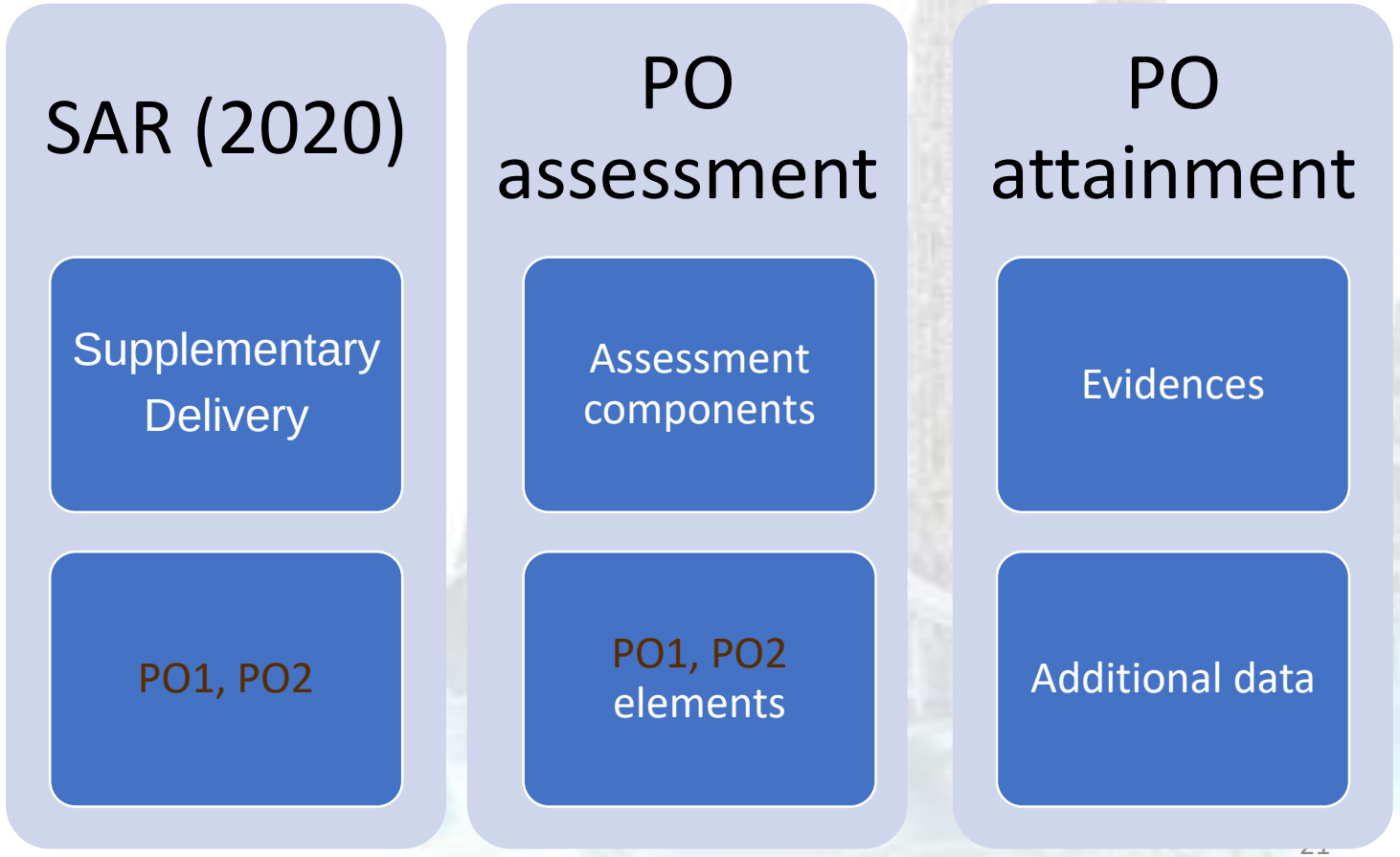
Gap Analysis - Examples

WK1 - A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences

- Where do we cover WK1? (PO1 Eng knowledge, PO2 Problem analysis)

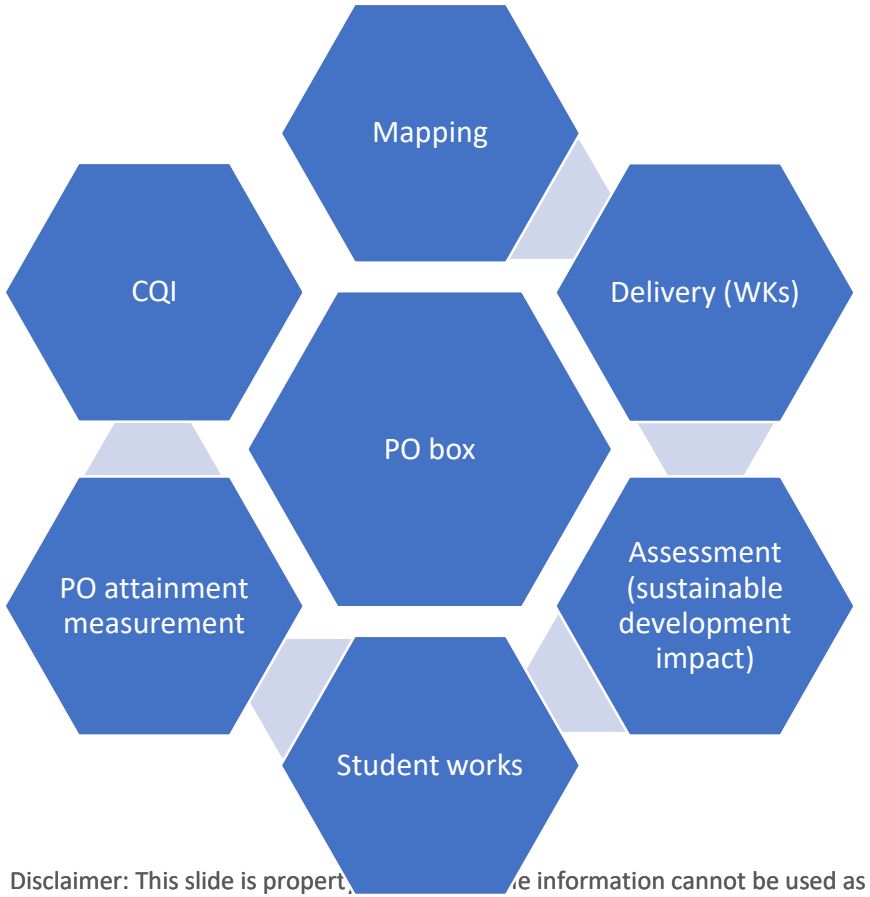
If we don't have PO box



Gap Analysis - Examples

WK9: Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes

- Where do we cover WK9? (PO7 Ethics, PO8 Individual and Collaborative Team Work)



Mapping	Delivery	Evidence
PO7, PO8	Which courses	Student works
Topics covered	Examples	Examples

THANK YOU

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BOARD OF ENGINEERS MALAYSIA
Tingkat 11 & 17, Blok F Ibu Pejabat JKR
Jalan Sultan Salahuddin, 50580 Kuala Lumpur
http://www.bem.org.my
enquiry@bem.org.my or complaint@bem.org.my.
Tel: 03-26912090; 03-26107095/96 Fax: 03-26925017