

OBEM Framework

Part 1 - The design and design quality assurance process



Design

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Purpose

A KMUTT OBEM (Outcome-Based Education Module) is a self-contained learning unit focused on one precise, measurable competency, designed for modular stacking and flexible pathway formation.

KMUTT's OBEM framework leverages a modular-based design to guarantee every intended learning outcome, giving every learner a solid foundation of demonstrable ability while empowering flexible, individualized pathways that let graduates pivot across careers in a fast-changing job market—and, at scale, help Thailand close its national skills gap.

End Goal — Guaranteed Learning Outcomes: Ultimately, OBEM crystallizes an institutional promise: every learner who completes a KMUTT module or programme will have verifiable evidence of achieving the intended learning outcomes. This assurance—grounded in transparent assessment data and rigorous quality checks—gives students, employers, and society confidence in the value of a KMUTT education.

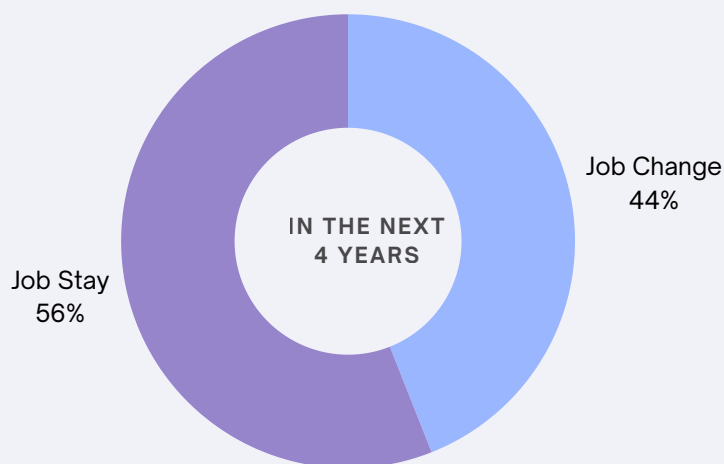
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Why

In an era where nearly half of workplace skills turn over within just four years (WEF 2023), KMUTT must guarantee outcome-level transparency so our graduates—and the university itself—can thrive amid constant disruption; the World Economic Forum projects that 44% of core job skills will change within four years, underscoring the need for modular agility. Verified competencies now carry more weight in hiring decisions—75% of recruiters prioritize skill badges over degree titles (LinkedIn Hiring Report 2024)—while stackable pathways have been shown to lower dropout risk by 18% and raise completion rates by 12% (Xu & Stevens 2022). Constructive alignment around explicit outcomes yields an average student achievement effect size of 0.47 (Hattie 2023), equivalent to moving a cohort from the 50th to the 67th percentile; these findings confirm that a modular, outcome-based design is essential for keeping KMUTT competitive, inclusive, and impactful.

If we fail to act — risks for KMUTT: Failing to adopt OBEM would expose KMUTT to higher graduate underemployment caused by outdated skills (OECD 2023), declining enrollment and revenue as students gravitate to flexible providers (HolonIQ 2024), weakened industry partnerships due to limited module customization (SEAMEO 2024), and potential accreditation jeopardy as quality agencies intensify scrutiny of outcome evidence.



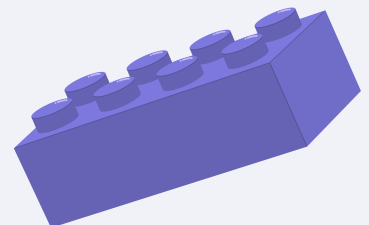
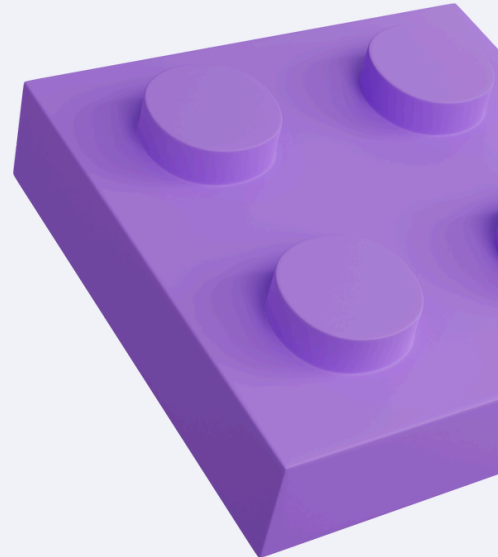
OBEMS at KMUTT

OBEM implementation at KMUTT serves two critical purposes. First, it enhances foundational learning in academic subjects where conceptual mastery is essential for progression. Second, it enables the creation of flexible, job-aligned modules that accelerate readiness for specific careers. These dual benefits position OBEM as a powerful tool for both educational quality and workforce relevance.

1. OBEM for Academic-Focused (Foundational) Subjects Many students struggle to pass foundational courses like CAL101 and PHY101 because the traditional OBE model doesn't clarify which concepts they misunderstand. OBEM improves this by breaking down core academic subjects—such as Calculus, Physics, Chemistry, and Statistics—into modular units with clear competencies. Each OBEM module offers targeted practice and feedback, helping students master concepts they find difficult without repeating entire courses.

2. OBEM for Career-Focused (Job-Related) Subjects For job-related subjects, OBEM extracts and crystallises the specific technical and generic competencies embedded in traditional curricula into modular learning outcomes directly aligned with workforce demands. These job-aligned OBEMs allow the creation of demand-driven pathways that deliver tangible, job-specific benefits. Learners can stack modules tailored to specific industry requirements, gaining confidence and clarity on the practical value of each competency acquired.

A learning pathway is a progression of ability, guiding learners through sequenced competency milestones that build from foundational to advanced skills aligned with programme objectives. Pathways are constructed from multiple OBEMs, each delivering a discrete competency block, and can vary in length depending on the complexity of the targeted competency and the designer's intended learner profile; for example, when learners already possess relevant background knowledge, a pathway may be designed more concisely.



OBEM Levels

OBEM modules progress through four performance stages that guide both design and assessment, drawing from research-based frameworks on how competence evolves in learners. These stages ensure that each module scaffolds learning in a structured, meaningful way—from basic conceptual comprehension to full workplace proficiency.

Level of proficiency

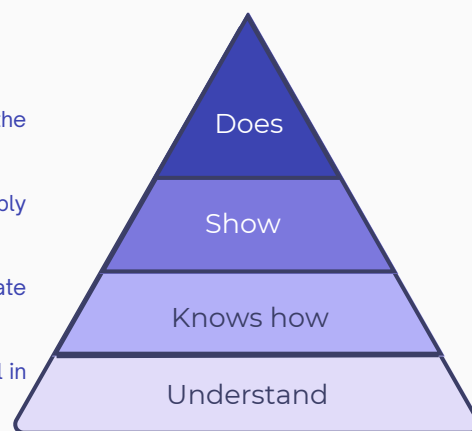
Gery's Framework (1991)

Understand (Comprehension – เข้าใจ): Learner understands the foundational concepts.

KnowHow (Conscious effort – ลงมือทำ, ฝึกทำ): Learner can apply concepts in structured practice with some guidance.

Show (Conscious action – ทำได้): Learner can demonstrate ability in semi-authentic or simulated real-world tasks.

Does (Proficiency – ทำเป็น): Learner reliably performs the skill in a professional or real setting, indicating full competency.



Adapt from Miller's Pyramid Framework (1990)

Understand – Learners internalize core concepts and theoretical foundations of the competency. However, the goal is not for learners to merely memorize or recite these concepts; instead, they are expected to demonstrate their understanding through appropriate performance-based tasks that provide evidence of conceptual comprehension. These may include written explanations, concept mapping, or simple application scenarios that validate their grasp of the ideas in context.

KnowHow – Learners apply these concepts in structured or scaffolded contexts, demonstrating guided proficiency. This stage moves beyond conceptual understanding by asking learners to make use of the concept within semi-predictable or teacher-supported scenarios—such as guided lab experiments, case walkthroughs, tutorials with structured steps, or scaffolded design tasks. Unlike “Understand,” which focuses on clarity of concept, “KnowHow” emphasizes using that concept meaningfully in context, while still benefiting from scaffolding or support. This stage builds learner confidence and fluency prior to independent application.

Show – Learners independently perform tasks or produce artefacts that exhibit the competency with minimal support. Most real-world project tasks or simulations that mimic actual job scenarios typically fall under this “Show” level, as they require learners to demonstrate ability in semi-authentic contexts without full immersion in professional settings. Examples include capstone presentations, simulated labs, mock client deliverables, or prototype development.

Does – Learners consistently execute and transfer the competency in authentic or professional settings, evidencing full mastery. At this Does level, the OBEM is recognized as a micro-credential; designers must align their module design to the KMUTT Micro-Credential Framework and contact 4lifelonglearning.org for guidance. Evidence here comes from live performance in real job settings, internships, or validated freelance/professional work.

PLOs and OBEM Pathways

Programme Learning Outcomes (PLOs) define the broad, discipline-level competencies required for graduation, while OBEM pathways translate these high-level goals into explicit, job-specific modular sequences for targeted competency development tailored to particular job roles or complex tasks.

Each pathway is constructed by selecting and sequencing OBEMs whose ultimate learning outcomes may align with existing PLOs or introduce new competencies beyond current programme outcomes, allowing both core and specialized skills to be developed through modular stacking:

- Individual OBEMs target specific micro-competencies that serve as building blocks for PLO achievement.
- The pathway's top-view rubric aggregates criteria from each OBEM, offering a clear overview of how module-level successes contribute to overall PLO attainment.
- The OBEM matrix can be used to trace each PLO to its contributing OBEMs, ensuring comprehensive coverage and identifying any gaps.
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By design, the relationship between a pathway and a Programme Learning Outcome (PLO) can be dynamic and contextual. A single programme can support multiple pathways, each responsive to specific job demands or learner preferences, and any of these pathways may serve as a scaffold toward one or more PLOs. Designing career-specific pathways based on workforce needs enables learners to see the tangible value of each skill acquired, making their educational journey more purposeful, personalized, and efficient.

It is often difficult to make Programme Learning Outcomes (PLOs) specific to individual career requirements, as they are typically designed within a four-year curricular structure to ensure broad intellectual development and general professional readiness. PLOs reflect a holistic educational goal aimed at producing well-rounded graduates, not necessarily aligned with precise job roles. In contrast, OBEM pathways offer a more flexible mechanism for curriculum design and learner navigation. By grouping OBEMs into career-relevant pathways, educators and learners can tailor experiences more precisely to workforce needs without compromising the broader educational mission.

Through this alignment, OBEM pathways guide learners through coherent skill development stages and enable programme teams to monitor and assure progress toward each PLO.

Guiding Principles

To make guaranteed learning outcomes possible, KMUTT adopts five evidence-based principles validated in higher-education research (e.g., Hattie 2023; Freeman et al. 2014; Prince 2004) as drivers of deeper learning, improved retention, and stronger employability. Curriculum designers can use them as a litmus test: if a syllabus element doesn't clearly align with at least one principle, it likely needs rethinking.

01 Constructive Alignment

Every learning outcome is explicitly mapped to aligned activities and performance-based assessments, ensuring teaching, learning, and evidence collection operate in lockstep toward demonstrable competence.

02 Authentic Evidence

Each OBEM is performance-based: learner performance on real-world tasks serves as the primary evidence of ability, evaluated with rigorously defined performance rubrics.

03 Learner-Centric Flexibility

OBEM pathways enable stackable, personalized journeys, letting learners combine related modules to build targeted skills for specific roles.

04 Transparency

Outcomes and evidence are visible to learners, educators, and employers, empowering self-directed pathways and easy verification of competence.

05 Quality Assurance & Continuous Improvement

Data-driven reviews each semester help educators refine their practice and improve every cycle.

Terms and Definitions

Outcome-Based Education Module (OBEM) — A self-contained learning unit articulating a single, precise learning outcome, aligned activities, and performance-based assessments. OBEMs are stackable and credentialable.

Constructive Alignment — Intentional linking of outcomes, activities, and assessments to reinforce learning and demonstrate competence.

OBEM Pathway — A sequence of related OBEMs assembled as stepping stones toward comprehensive competency mastery; pathways are stackable, age-agnostic, and flexible.

KMUTT Qualification Framework (KMUTTQF) — Broad competencies every KMUTT graduate must demonstrate (e.g., Ethical Leadership, Digital Fluency).

Programme Learning Outcomes (PLOs) — Discipline-specific competencies required for graduation and accreditation.

Course Learning Outcomes (CLOs) — Observable knowledge, skills, and attitudes attained within a course, mapping upward to PLOs and QF GAs.

Assessment — Gathering evidence of learner performance through tests, projects, and observations.

Learning Evaluation — Interpreting assessment data to judge learner achievement against criteria.

Performance Rubric — Criteria and proficiency levels describing successful performance for a task.

Authentic Evidence — Learner-produced artefacts mirroring real-world tasks.

Holistic Rubric — A single-score rubric for a global performance judgment.

Analytic Rubric — A multi-criteria rubric assigning separate scores for each performance dimension.

Continuous Improvement — A cyclical process of data-driven reflection and refinement.

Learning Pathway and its Design Process

A Learning Pathway is a structured, stackable sequence of OBEMs ensuring coherent progression toward targeted competencies. Pathways guide learners through clear milestones, reduce time-to-employment, and offer transparency of outcomes. They also serve as demand-led learning products for all ages, addressing Thailand's skills gap.

1 Stakeholder Analysis

Engage industry partners, alumni, students, faculty, and regulators to identify needs, pain points, and skill gaps via interviews, surveys, and labour-market analytics.

2 Extract Competencies & Define Outcomes

(Optional for pathway design; required for full curriculum) — Cluster needs into competency themes and draft PLOs benchmarked against QF GAs. Derive CLOs with Bloom-aligned verbs, ensuring job specificity and value.

3 Job-Role-Driven Extraction

Analyze job descriptions to extract essential competencies and compare them to programme offerings for curriculum transformation.

4 Construct Pathways

Visualize and assemble OBEMs as competency milestones. Use Excel, Miro, or flowcharts to align modules, annotate dependencies, and embed flexible entry/exit points.

5 Design Evidence & Activities

Define performance expectations, select authentic assessments, develop rubrics, and plan scaffolded learning activities in LEB2, embedding visible rubrics so learners know how well they must perform.

6 Detailed OBEM Design

Design each OBEM with one ultimate learning outcome, aligned activities, assessment criteria, and a development plan, ensuring standalone value.

7 Validate & Iterate

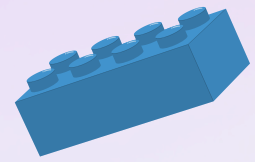
Share prototypes with stakeholders and refine based on feedback

8 Implement & Improve

Deploy in LEB2, collect evidence, and iterate each round

OBEM Example

– “Data Visualisation Fundamentals”



Ultimate Learning Outcome: Design and present an interactive dashboard communicating a data story using industry-standard tools, and ensure it is compliant with WCAG AA UX standards.

Holistic Performance Rubrics

Level 1 – Developing: Fails to convey the data story; cluttered and non-interactive.

Level 2 – Emerging: Basic insights with inconsistent design and limited interactivity.

Level 3 – *Proficient: Communicates key insights with balanced design and functionality. (Expected)*

Level 4 – Advanced: Engaging narrative, professional design, and full responsiveness.

Level 5 – Expert: Inclusive, seamless exploration that drives confident decisions.

Note: Achievement of the module learning outcome at Level 3 is guaranteed, provided the learner has demonstrated the necessary performance criteria as followed.

Analytic Rubrics (For teacher use; optional for proposal)

Criteria	Level 1	Level 2	Level 3	Level 4	Level 5
Narrative Clarity	Charts mismatch the story	Partially coherent	Clear insights	Logical flow	Drives confident decisions
Visual Design	Cluttered layout	Basic consistency issues	Clean, balanced design	Professional aesthetics	Exemplary engagement
Interactivity	Non-functional	Limited intuitive features	Supports exploration	Dynamic filtering	Anticipates user needs
Accessibility & UX	Fails basic standards	Gaps in accessibility	Meets core standards	Fully WCAG AA compliant	Exceeds accessibility

Pathway Example

– “Mobile UX Designer (Entry-Level)”



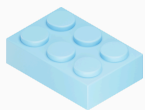
Pathway Learning Outcome: design and deliver mobile-first user experiences by identifying user problems, creating interactive prototypes, testing and refining designs based on usability feedback, communicating UX insights through interactive dashboards, and handing off developer-ready design assets for implementation.

OBEM Pathway



Module 1: User Problem Framing & Hypothesis Design

→ Learners will be able to define user-centered design problems and develop UX hypotheses based on scenario framing and stakeholder analysis.



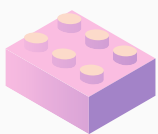
Module 2: Wireframe for Mobile Touch Interaction

→ Learners will be able to create low-to-mid fidelity wireframes that address task flows and interaction patterns optimized for touch-based mobile interfaces.



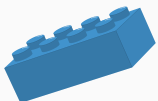
Module 3: Prototype Design & Interaction Flow

→ Learners will be able to develop interactive mobile UX prototypes that simulate core user journeys with working navigation and feedback components.



Module 4: Mobile Usability Testing & Refinement

→ Learners will be able to plan, conduct, and document usability tests on mobile prototypes and make data-informed design refinements.



Module 5: Data Visualisation for UX Decision Making (From our OBEM example)

→ Learners will be able to design and present an interactive dashboard that communicates UX research or performance data using industry-standard tools, and meets WCAG AA accessibility standards.



Module 6: Handoff & Dev Collaboration for Mobile UI

→ Learners will be able to produce and deliver developer-ready design assets and specifications for mobile interfaces using professional handoff workflows and tools.

Note: Achievement of the pathway learning outcome is guaranteed, provided the learner has achieved all the OBEM outcomes above.

OBEM Resources

- KMUTT EDS OBEM Hub: <https://eds.kmutt.ac.th/obem>
- [Customised GPI for OBEM Design](#)
- LEB2 Platform: <https://www.leb2.org/>
- [OBEM class in LEB2](#)
- EDS Contact: <https://eds.kmutt.ac.th/en/>

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Thank you!

Thank you for taking the time to read this framework. If you have any questions or would like to discuss our findings further, please don't hesitate to reach out to us.



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