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Outcome-Based Education Curriculum Development: Conceptual Foundations and Implementation Challenges in Indonesian Higher Education

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ABSTRACT

The adoption of Outcome-Based Education (OBE) has become the mainstream of higher education curriculum reform in Indonesia, driven by the Indonesian National Qualifications Framework (KKNI), the National Standards for Higher Education, the Merdeka Belajar–Kampus Merdeka (MBKM) policy, and national as well as international accreditation requirements. Its implementation, however, often stops at the documentary level and has yet to reach the transformation of learning processes and assessment. This article is an integrative literature review that aims to (1) examine the conceptual foundations of OBE, (2) synthesise models of outcome-based curriculum development, (3) analyse implementation challenges in the Indonesian context, and (4) formulate a coherent development framework. A search was conducted across 64 sources from the Scopus, ERIC, DOAJ, and Garuda databases for the period 1994-2025, then analysed thematically using Spady's OBE principles and Biggs' constructive alignment. The review shows that effective OBE curriculum development requires vertical alignment from the Graduate Profile down to lesson-level learning outcomes, constructive alignment among outcomes, learning experiences, and assessment, and a continuous quality improvement mechanism that closes the loop. The main challenges include shifting lecturers' mindsets, assessment workload, learning-outcome inflation, limited information systems, and the gap between the written and the enacted curriculum. The article proposes a capacity-building framework and an agenda for further research.

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1. INTRODUCTION

Over the past three decades, the paradigm of higher education has shifted from an input- and process-oriented focus to an outcome-oriented one. Outcome-Based Education

(OBE) places observable and measurable learning outcomes at the starting point of every curricular decision: what graduates must master determines how learning is designed, delivered, and assessed [1], [2]. This idea was first systematised by Spady through four principles clarity of focus, designing down, high expectations, and expanded opportunity and was later reinforced by Biggs' constructive alignment framework, which demands explicit alignment among objectives, learning activities, and assessment [3], [4], [33]. In professional education, OBE has been widely adopted through the AMEE guidelines and through engineering-accreditation reforms following Engineering Criteria 2000 and the Washington Accord [5], [6], [7], [47]. In Indonesia, this shift has acquired strong regulatory grounding. The Indonesian National Qualifications Framework (KKNI) establishes qualification levels and outcome descriptors that serve as the reference for formulating graduate learning outcomes [8]. The National Standards for Higher Education (SN-Dikti) affirms learning outcomes as the standard of graduate competency and requires learning plans to be coherently structured down to the course level [9]. The curriculum-development guidelines issued by the Directorate General of Higher Education explicitly adopt the OBE approach and link it to the Merdeka Belajar–Kampus Merdeka (MBKM, Freedom to Learn Independent Campus) policy [10], [11]. At the same time, both the national study-programme accreditation instruments and Washington Accord-aligned accreditation through IABEE make evidence of outcome measurement and follow-up improvement a core assessment component [12], [13], [49], [50]. Nevertheless, a number of studies report that OBE adoption in many higher-education institutions remains largely administrative: curriculum documents are reformatted around outcome statements, while classroom teaching and assessment practices remain relatively unchanged [14], [15], [57]. A symptom of learning-outcome inflation has also emerged outcome statements that are too numerous, overlapping, and difficult to measure together with a disproportionate assessment workload [16], [17], [31]. This gap between the intended, the enacted, and the assessed curriculum makes OBE vulnerable to becoming a ritual of compliance rather than an instrument of quality improvement [18], [39]. This article is written from the standpoint of an OBE system developer and reviewer, with four objectives: (1) to examine the conceptual foundations and variants of OBE; (2) to synthesise models of outcome-based curriculum development, from the Graduate Profile down to course-level sub-learning outcomes (sub-CPMK); (3) to analyse implementation challenges within the Indonesian policy and institutional context; and (4) to formulate a coherent development framework together with a research agenda.

The novelty of this article lies in integrating three layers of alignment vertical, constructive, and evaluative into a single operational framework that is contextualised to KKNI, SN-Dikti, and MBKM, along with graphical illustrations of its evaluation outputs.

2. METHOD

This study uses an integrative literature review approach, which allows for the combination of evidence from conceptual, empirical, and policy sources [19]. The procedure was carried out in five stages: formulating the review questions, systematic searching, screening, extraction, and thematic synthesis.

Review questions (a) How are the conceptual foundations of OBE formulated in the literature? (b) What models and procedures are used to develop outcome-based curricula? (c) What challenges and success factors are reported in implementation, particularly in Indonesian higher education?

The search was conducted in the Scopus, ERIC, DOAJ, and Garuda databases, supplemented by a manual search of policy documents (presidential regulations, ministerial regulations, Directorate General of Higher Education guidelines, and BAN-PT/LAM and IABEE accreditation criteria). Combined keywords included “outcome-based education”, “outcome-based curriculum”, “learning outcomes”, “constructive alignment”, “curriculum mapping”, and “continuous quality improvement”, together with their Indonesian equivalents “kurikulum berbasis capaian” (outcome-based curriculum), “capaian pembelajaran lulusan” (graduate learning outcomes), and “OBE”. The 1994-2025 time span was chosen with its starting point set at the publication of Spady’s foundational work [1].

Sources were included if they (i) discussed the concepts, development models, assessment, or implementation of OBE at the higher-education or professional-education level; (ii) were peer-reviewed articles, reference books, or official policy documents; and (iii) were available in full text. Sources were excluded if they mentioned OBE only in passing, were conference abstracts without full text, or if their credibility could not be verified. From 187 initial records, after duplicate removal and title–abstract–full-text screening, 64 sources were retained for analysis.

Data extraction covered the aims, context, theoretical framework, development procedures, assessment instruments, findings, and limitations of each source. Synthesis was conducted thematically using a combined analytical framework: Spady’s four OBE principles [1], Biggs’ constructive alignment [3], and classical curriculum-development

models (Tyler, Taba) together with backward design [20], [21], [22]. The illustrative charts in Subsection 3.8 were constructed from synthetic data to demonstrate the form of OBE evaluation outputs, not as empirical findings. The trustworthiness of the synthesis was maintained through cross-author review and an audit trail of inclusion decisions.

3. RESULT AND DISCUSSION

3.1. Conceptual Foundations and Variants of OBE

OBE is defined as an educational approach that demands clarity about what learners must be able to do at the end of a learning process, and then organises the curriculum, pedagogy, and assessment to ensure that this is achieved [1], [23], [37]. Spady's four principles serve as quality markers: clarity of focus requires every component to point toward the culminating outcome; designing down requires design to begin from the final outcome and then to be cascaded down into smaller elements; high expectations rejects the normal curve and sets a high standard of mastery for all learners; and expanded opportunity acknowledges diverse pathways and timeframes for reaching the same standard [1], [24], [33]. This cascading flow is summarised in Figure 1.

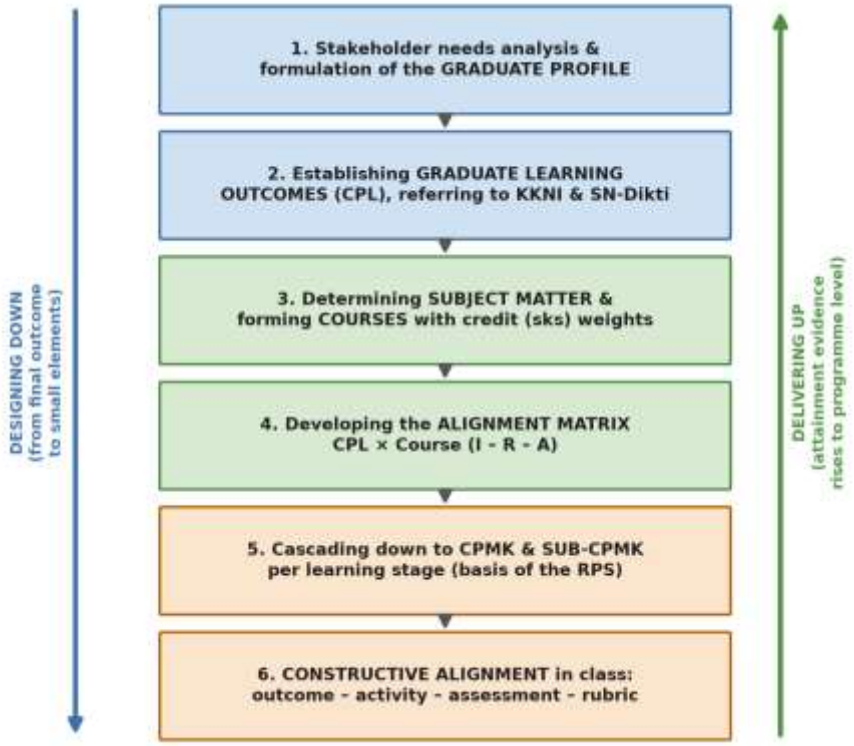

Figure 1. Cascading flow of OBE curriculum development (designing down) and the direction of quality assurance (delivering up)

The literature distinguishes three variants: traditional OBE (focused on mastery of course content), transitional OBE (emphasising cross-course competencies such as critical thinking and communication), and transformational OBE (oriented toward life roles and real-world challenges) [1], [25], [34]. Most higher education implementations operate along the traditional transitional spectrum. Conceptual criticism should be noted: applying OBE to school-system reforms in South Africa and Australia generated difficulties when outcome statements became overly technocratic and burdensome for teachers [35], [36]. In higher education, excessive outcome statements can reduce learning to a checklist, narrow the curriculum to what is easily measured, and neglect unexpected yet valuable learning [16], [26], [38], [40]. A healthy implementation of OBE therefore treats outcomes as sufficient but not exhaustive a guaranteed minimum threshold rather than an upper bound on learning [41], [42].

3.2. OBE within the Indonesian Higher-Education Policy Framework

Four policy instruments shape the national OBE architecture. First, KKNI provides the qualification-level reference (Bachelor's at level 6, Master's at level 8, Doctorate at level 9) together with descriptors of attitudes, knowledge, and general/specific skills that serve as the raw material for Graduate Learning Outcomes (CPL) [8]. Second, SN-Dikti establishes CPL as the standard of graduate competency and requires a Semester Learning Plan (RPS) containing measurable course learning outcomes (CPMK) and sub-CPMK [9]. Third, the Directorate General of Higher Education's guidelines operationalise OBE through the stages of formulating the Graduate Profile, establishing CPL, forming courses and their credit weights, developing an alignment matrix, and preparing learning materials; the same guidelines link curriculum structure to MBKM learning rights undertaken outside the study programme [10], [11]. Fourth, accreditation whether through the BAN-PT/LAM instrument or Washington Accord-aligned IABEE accreditation assesses the existence of mechanisms for measuring CPL attainment and their follow-up improvement [12], [13]. A similar pattern is found in European frameworks (Tuning, EQF) and engineering accreditation (ABET, IEA), which make learning outcomes the basis of cross-country quality assurance [44], [45], [46], [49], [50].

The implication is that formal compliance with OBE in Indonesia is almost mandatory. The risk is that the motive of accreditation compliance overtakes the motive of improving learning, so that documents become tidy while classroom practice lags behind [14], [18]. MBKM integration adds further complexity: recognising learning undertaken

outside the study programme requires a CPL mapping flexible enough to accommodate the equivalence of internships, projects, or exchanges, without lowering the demands of the outcomes [11], [32].

3.3. Models of Outcome-Based Curriculum Development

The literature synthesis yields a staged designing-down flow that is consistent with the Tyler–Taba tradition and backward design [20], [21], [22], visualised in Figure 1:

1. Needs analysis and Graduate Profile – a study of stakeholder needs (professional associations, employers, alumni), a review of tracer studies, and an analysis of disciplinary developments together produce the Graduate Profile as a statement of the roles graduates can perform [46].
2. Formulating CPL / Programme Learning Outcomes – the Profile is translated into CPL covering the domains of attitudes, knowledge, and skills, referring to the KKNI and SN-Dikti descriptors [8], [9]. CPL are written using measurable verbs and at an appropriate level of generality (typically 8–15 items) [25], [43].
3. Forming subject matter and courses – CPL are mapped onto bodies of knowledge, which are then grouped into courses with credit (sks) weights reflecting estimated learning time.
4. Alignment matrix (curriculum mapping) – the CPL × course relationship is documented with markers indicating the level of contribution (e.g., Introduced Reinforced Assessed/Mastered), to detect CPL that are unserved or overloaded onto a single course [27].
5. Cascading down to CPMK and sub-CPMK – each course formulates CPMK as an elaboration of the CPL assigned to it, and then sub-CPMK as the terminal competency of each learning stage; both become the basis of the RPS [9], [10].
6. Course-level constructive alignment – selecting learning experiences and assessment forms that directly demand performance matching the verbs used in the sub-CPMK [3], [28], [47], [48] (Figure 2).

Table 1. Example of vertical alignment from the Graduate Profile to assessment

Layer	Formulation (brief example)	Reference
Graduate Profile	Designer of engineering solutions grounded in ethics and sustainability	Stakeholder needs

Layer	Formulation (brief example)	Reference
CPL	Able to design systems/components that meet requirements while considering occupational health, safety, and environmental (K3L) aspects	KKNI level 6; SN-Dikti [8], [9]
CPMK	Able to apply design methods to multidisciplinary engineering problems	Elaboration of CPL
Sub-CPMK	Able to develop design specifications from user-needs analysis	Learning stages 1–4
Learning experience	Problem-based project studio, periodic design critique	Constructive alignment [3]
Assessment	Design-report rubric + presentation + process logbook	Direct evidence [29]

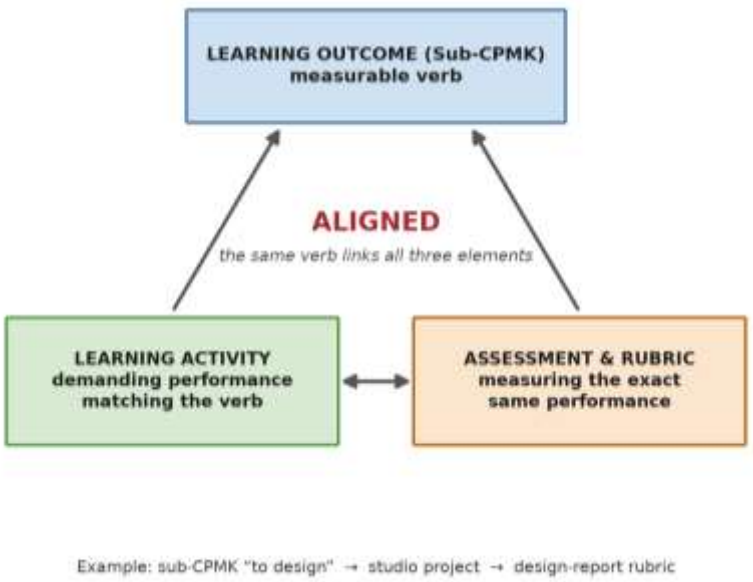

Figure 2. Constructive alignment: the same verb links the outcome, the learning activity, and the assessment

Constructive alignment is the key: if a sub-CPMK demands “to design”, then the dominant assessment must be a design task scored with a criterion-based rubric, not a multiple-choice exam that merely tests recall of procedures [3], [30], [47]. Aligned formative feedback further strengthens this learning effect [51], [52], [53].

3.4. Assessment, Attainment Measurement, and Closing the Loop

An OBE system requires two types of evidence: *direct evidence* – students’ actual performance through projects, portfolios, performance examinations, and case studies – and *indirect* evidence – perceptions gathered through surveys, exit interviews, and feedback from graduate employers [29], [31], [54]. Analytic rubrics play a central role because they

translate abstract outcomes into criteria and performance levels that can be scored consistently [30], [55].

Attainment measurement is generally carried out at two levels: aggregating sub-CPMK scores into a CPMK index per course, and then aggregating across the courses "responsible" for a CPL into a programme-level CPL index. An attainment threshold (e.g., ≥70% of students reaching the "competent" category) is set and periodically reviewed. What distinguishes quality OBE from mere reporting is *closing the loop*: measurement results are brought to a curriculum-evaluation meeting, their root causes are identified, and concrete corrective actions result RPS revision, prerequisite restructuring, lecturer training, or changes to subject matter whose effects are then re-measured in the next cycle [7], [13], [56]. This cycle is summarised in Figure 3; failure to close the loop is the most common finding in accreditation reviews [14], [18].

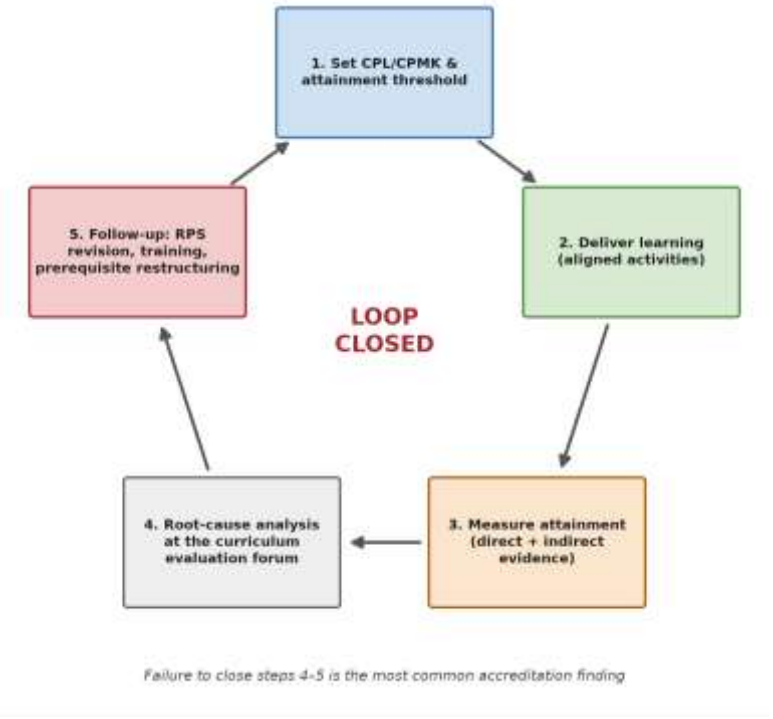

Figure 3. Continuous quality improvement cycle at the study-programme level

3.5. Implementation Challenges

The literature synthesis groups the barriers into five clusters:

1. Lecturers' mindset and competency. The shift from a "teaching content" orientation to an "assuring outcomes" orientation demands assessment and learning-design literacy that is not yet evenly distributed; some lecturers view OBE as an administrative burden [14], [17], [57].

2. Inflation and poor quality of outcome statements. CPL/CPMK that are too numerous, overlapping, contain unmeasurable verbs ("understand", "know"), or combine two competencies in a single statement make measurement difficult [16], [26], [38].
3. Assessment and data burden. Collecting evidence for every sub-CPMK across all courses generates a large volume of data; without an academic information system that supports mapping and aggregation, the process becomes manual, slow, and error-prone [17], [31].
4. Fragile alignment. Curriculum matrices are often prepared once and then not maintained; changes in courses or course lecturers are not followed by updates to the map, producing a misalignment between documents and implementation [18], [27].
5. Governance and quality culture. Closing the loop requires study-programme leadership, institutionalised evaluation-meeting time, and a culture of using data for improvement rather than punishment. A dominant accreditation-compliance motive can, in fact, suppress the honesty of data reporting [14], [18], [56]. Academic resistance to learning outcomes also stems from concerns about a narrowing of academic freedom [39], [40], [41].

In the Indonesian context, these challenges interact with the large lecturer-to-student ratio found in a number of study programmes, variation in institutional readiness, and the simultaneous demand to implement MBKM, which adds further points of outcome equivalence that must be managed [11], [32].

3.6. Proposed Development Framework: Three Layers of Alignment

Based on the synthesis above, this article proposes an operational framework that links three layers of alignment into a single, integrated whole (Figure 4):

1. Vertical alignment – the chain Graduate Profile → CPL → CPMK → sub-CPMK is maintained through a curriculum matrix updated every cycle, with the rule that every CPL has at least one "responsible" course that carries out the culminating assessment.
2. Constructive alignment – within each course, the verb of the sub-CPMK determines the dominant assessment form and learning activity; the RPS contains an alignment table of sub-CPMK × activity × assessment × rubric.
3. Evaluative alignment – CPMK/CPL measurement results are analysed at a scheduled curriculum-evaluation forum (e.g., at the end of every semester for CPMK, annually for CPL, and every 4–5 years for a major review), producing an action plan that is tracked through to completion.

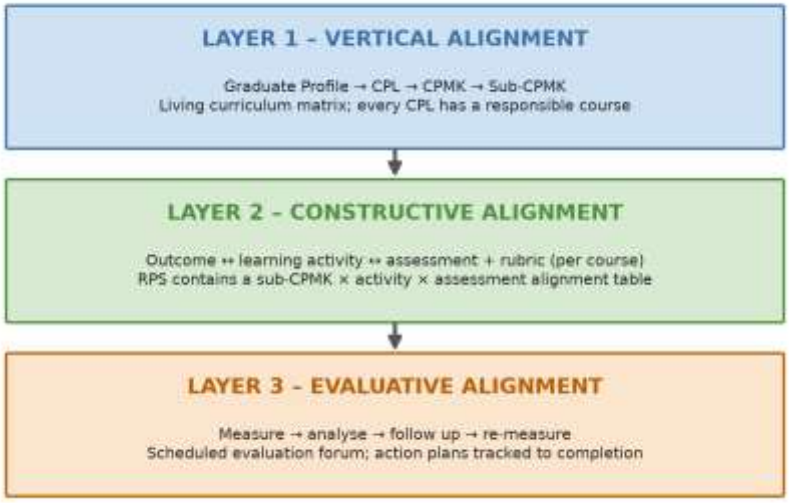

Figure 4. Three-layer alignment framework for OBE curriculum development, with its enabling factors.

Table 2. Institutional prerequisites for each alignment layer

Layer	Key prerequisite	Success indicator
Vertical	Living curriculum matrix; CPL custodian	100% of CPL have an assessment point; no "orphan" courses
Constructive	Assessment-design training; rubric bank	≥80% of RPS contain a rubric aligned to the sub-CPMK
Evaluative	Institutionalised evaluation forum; supporting academic information system (SIA)	≥90% of the previous cycle's action plans completed and measured

Cross-layer enabling factors include: continuous lecturer capacity-building programmes (rather than a one-off workshop), an information system that automates mapping and aggregation, academic leadership that turns outcome data into material for improvement dialogue, and communities of practice across study programmes for sharing rubrics and experience [7], [17], [56].

3.7. Research Agenda

Four research gaps stand out. First, *impact evidence*: few longitudinal studies link OBE implementation with improved learning outcomes or graduate job readiness in Indonesia [6], [15]. Second, *measurement validity*: inter-rater reliability of rubrics and the validity of aggregating sub-CPMK scores into a CPL index have rarely been tested [30], [55]. Third, *implementation* economics: the time cost to lecturers and the return on investment of OBE information systems remain undocumented [31]. Fourth, *OBE and MBKM*: models for recognising outcomes achieved through activities outside the study programme, while preserving quality equivalence, need to be tested empirically [11], [32].

3.8. Chart-Based Illustration of Attainment Evaluation

This subsection presents three forms of evaluation output commonly used by study programmes to monitor the evaluative-alignment layer. All figures are illustrative (synthetic data) and are intended to show the form of presentation, not empirical findings.

Figure 5 shows an attainment dashboard for nine CPL in one academic year against a 70% threshold. Three CPL fall below the threshold (CPL03, CPL05, CPL08) and are therefore automatically flagged for follow-up; a visualisation of this kind makes it easier for study-programme leaders to set improvement priorities in the evaluation forum [55], [56].

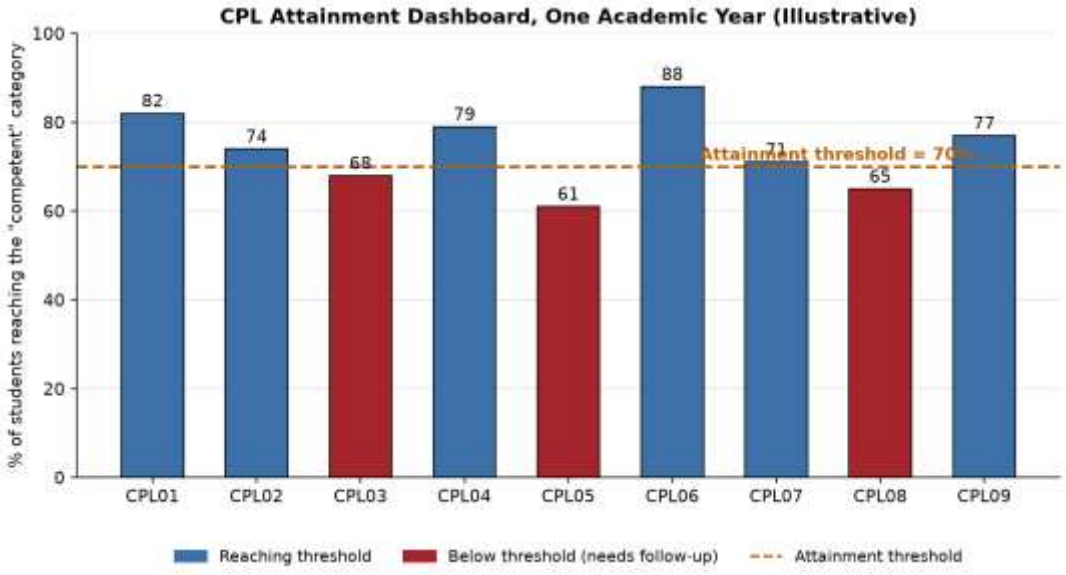

Figure 5. Example of a CPL attainment dashboard against a threshold (illustrative)

Figure 6 tracks three CPL across four evaluation cycles (2022-2025). Following a rubric-training intervention in 2023 and prerequisite restructuring together with project-based assignments in 2024, all three CPL move past the threshold by 2025. This pattern illustrates the effect of closing the loop: targeted follow-up produces measurable improvement between cycles [7], [13], [56].

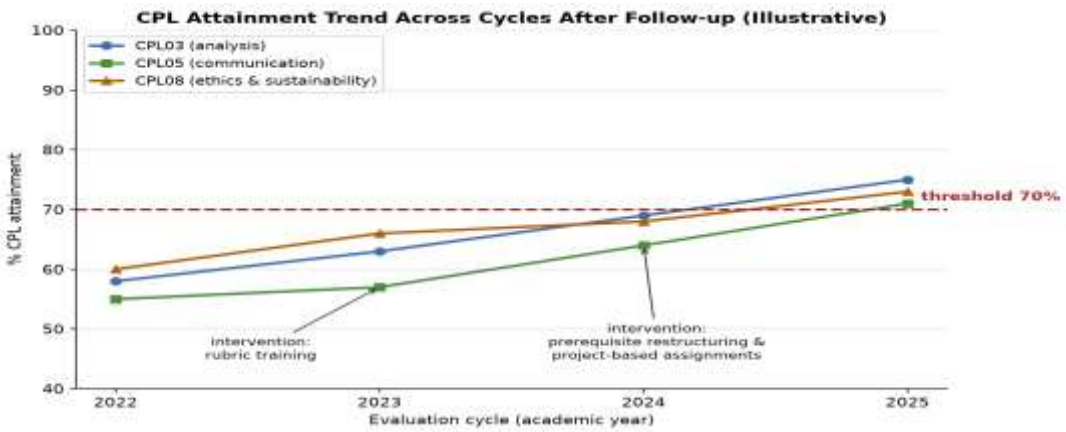

Figure 6. CPL attainment trend across cycles following follow-up action (illustrative)

Figure 7 presents a heat map of the CPL × course alignment matrix, marked with Introduced (I), Reinforced (R), and Assessed/Mastered (A). This map enforces the rule of the vertical layer: every CPL row must contain at least one "A" cell, and every course should ideally assess (not merely introduce) some of the outcomes assigned to it [27].

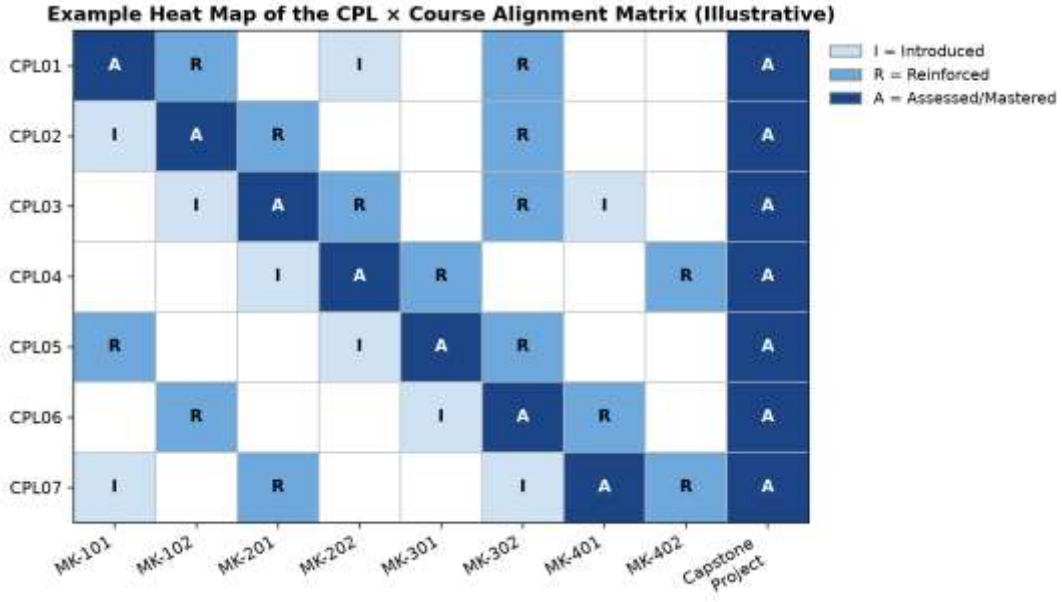

Figure 7. Example heat map of the CPL × course alignment matrix (illustrative).

These three presentations should be read together: Figure 7 ensures that every outcome has a measurement point, Figure 5 shows attainment status at a single point in time, and Figure 6 assesses whether follow-up actions have truly made a difference. Without this third layer (Figure 6), OBE evaluation stops at mere reporting.

7. CONCLUSION

OBE is not merely a curriculum-writing format but a discipline of maintaining alignment among the promise of outcomes, learning experiences, assessment, and corrective action. In Indonesia, the policy framework of KKNI, SN-Dikti, the Directorate General of Higher Education's guidelines, MBKM, and accreditation has already provided a strong mandate, so the central issue is no longer "whether" but "how deeply" OBE is implemented. This review concludes that effective OBE curriculum development requires three layers of alignment managed in an integrated manner: vertical (from the Graduate Profile down to the sub-CPMK), constructive (outcome–activity–assessment alignment at the course level), and evaluative (a measurement-and-improvement cycle that is genuinely closed, as illustrated in Figures 5-7). The greatest challenges are cultural and governance-related lecturers'

mindsets, assessment workload, outcome inflation, limited information systems, and the dominance of a compliance motive so the most promising strategies are continuous capacity building, information-system support, data-driven leadership, and communities of practice. The research agenda going forward should be directed at longitudinal impact evidence, the validity of outcome measurement, the economics of implementation, and models for integrating OBE with MBKM.

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