How Academic–Industry Dual Mentorship is Organised and Documented: A Case Study of Industry-Based Final-Year Projects in Malaysian TVET

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ABSTRACT

Academic–industry dual mentorship connects academic expectations with workplace projects, but its organisation must be examined through the records that assign responsibilities and document assessment and review. This study investigates these arrangements in Final-Year Project I and II within the Bachelor of Technology in Electrical System Maintenance programme at Universiti Teknikal Malaysia Melaka. A retrospective documentary case study integrated programme guidance, assessment forms, supervision and moderation registers, coordinator reports and linked assessment records for 107 students across four cohorts. Documents were selected for their relevance to mentoring, assessment governance and continuous quality improvement (CQI). Component marks were checked and summed, and achievement was summarised descriptively within each course and cohort. Industry contributed 50% of assessment and faculty supervisors and panels contributed the remaining 50% throughout. Cohort means ranged from 74.31% to 83.16% for FYP I and from 74.68% to 87.44% for FYP II. CQI included refinement of the FYP I CLO1 statement and expansion of the rubric scale from 0–3 in Cohort 1 to 0–10 in Cohorts 2–4, while outcome mappings and component weightings were retained. Moderation records illustrated academic guidance and requests for industrial consultation. The case demonstrates how complementary mentoring roles are supported by coordinated digital assessment and institutional review. It also identifies the need to preserve rubric versions and link feedback to subsequent decisions. Achievement differences provide contextual evidence, rather than causal estimates of mentoring effectiveness or demonstrated improvements in scoring reliability.

Keywords: Dual Mentorship, Work-Based Learning, Final-Year Projects, Documentary Case Study, Continuous Quality Improvement

INTRODUCTION

Industry-based final-year projects require students to address workplace problems while meeting academic expectations for problem formulation, project organisation, analysis and communication. The central educational challenge is to translate workplace activity into assessable learning. A project may benefit a company yet provide insufficient evidence for academic judgement; an academically coherent proposal may also be difficult to implement within operational schedules and resource constraints. Academic–industry dual mentorship provides a structure for negotiating these requirements.

At Universiti Teknikal Malaysia Melaka (UTeM), the Bachelor of Technology in Electrical System Maintenance programme (BELS) embeds Final-Year Project I (FYP I) and Final-Year Project II (FYP II) within work-based learning (WBL). Each project involves a faculty supervisor (TPF) and an industrial coach (JI), with a faculty panel contributing to assessment. FYP I focuses on developing and defending a proposal; FYP II emphasises implementation, analysis and presentation of results. The courses therefore represent successive learning stages with related, but distinct, assessment demands.

Previous BELS studies establish the context for examining these arrangements. Zakaria et al. (2025) described FYP assessment and first-cohort achievement, while Sabikan et al. (2025) examined WBL exit-survey findings

from 29 students. The present study extends the documentary scope to four cohorts and 107 linked FYP I–FYP II records. Its distinct focus is how responsibilities, assessment submissions, moderation and course review are organised and recorded. The four-cohort coverage strengthens the description of continuity and revision within this programme; it does not create a multi-institutional evaluation.

The study aims to explain how academic–industry dual mentorship is organised and documented within the BELS FYP sequence. Three research questions guide the analysis: (1) How are faculty and industrial responsibilities organised across FYP I and FYP II? (2) How do programme records document supervision, moderation and assessment? (3) How do coordinator reports document CQI concerns, actions and follow-up? Student achievement provides supporting context for the assessment records, rather than a measure of the causal effectiveness of dual mentorship.

LITERATURE REVIEW

Workplace guidance and academic–industry coordination

Billett (2002) locates workplace learning in the relationship between opportunities for participation, guidance and learner engagement. This perspective directs attention to meaningful work and support from experienced practitioners. In an industrial FYP, it encourages examination of the opportunities enabled by the industrial coach and the ways academic supervision connects workplace activity to educational expectations. Here, it informs the interpretation of documented responsibilities; the quality of student participation is not measured directly.

Similarly, Díaz et al. (2026) emphasise purposeful university–company arrangements and progressively supported participation in work-integrated learning. Although their graduate engineering setting differs from undergraduate BELS, their scaffolding model provides a useful conceptual connection: successive project stages require identifiable learning opportunities and coordination. Time spent in industry alone does not demonstrate development.

Staged learning and assessment alignment

Constructive alignment connects intended learning outcomes, learning activities and assessment (Biggs, 1996). The present study examines these connections by tracing course learning outcomes (CLOs) to assessment components and recorded weightings. The same programme learning outcome (PLO) may be addressed through different tasks at successive stages. Accordingly, shared PLO mappings do not establish that FYP I and FYP II scores have equivalent meanings.

MacLeod and van der Veen (2020) examine scaffolding through coursework, supervision and problem design in interdisciplinary project-based learning. Their work draws attention to how support is embedded in project organisation. In BELS, proposal moderation and the transition to implementation are points at which such support may be documented. Nevertheless, a course sequence alone cannot establish that guidance was progressively withdrawn or that students became more independent; these claims require evidence from mentor interactions and student work.

Feedback use and improvement evidence

Carless and Boud (2018) distinguish feedback provision from the learner's capacity to understand and use feedback. Their framework encompasses appreciating feedback, making judgements, managing affect and taking action. This distinction is particularly relevant to proposal moderation: a recorded comment establishes that advice was provided, whereas a revised proposal is needed to examine uptake. The same evidential distinction applies to CQI, where a recorded action must be separated from its demonstrated educational effect.

Together, these perspectives guide examination of three connected features: the allocation of mentoring responsibilities, the records of supervision and assessment, and the documentation of review and follow-up. Staged learning provides the curricular context for these features. Descriptive achievement summaries help

explain what the assessment records contain, while document comparison reveals whether responsibilities, outcomes and actions remain traceable across sources.

Programme And Case Context

The BELS work-based learning programme

The institutional context includes UTeM's Peraturan dan garis panduan pelaksanaan pembelajaran berasaskan kerja (WBL) di UTeM (Universiti Teknikal Malaysia Melaka, 2022). Programme-specific arrangements are documented in the second-edition BELS WBL handbook (Fakulti Teknologi dan Kejuruteraan Elektrik, 2025), which describes the 2.5u1i model and specifies a 52-week placement carrying 30 credits. FYP I (BELS3684) carries four credits and spans the first 20 weeks; FYP II (BELS3696) carries six credits and occupies weeks 21–28 in the short semester. Industrial training follows in weeks 29–52, while two additional WBL courses operate earlier in the placement. The FYP thus forms part of a broader workplace curriculum and remains distinct from subsequent industrial-training assessment.

The assessment dataset contains 107 students across Cohorts 1–4: 21, 29, 26 and 31, respectively. FYP I and FYP II were undertaken in semesters 2 and 3 of 2022/2023, 2023/2024, 2024/2025 and 2025/2026, respectively. All 107 identifiers were matched between the two course sheets, and all listed component fields contained numerical values. These counts define the records analysed; they are not presented as an independently verified census of every student ever registered in the programme.

Staged course outcomes

Table 1 presents the official course learning outcomes (CLOs) and programme learning outcome (PLO) mappings supplied for this revision. For both courses, CLO1 maps to C6/PLO1, CLO2 to P4/PLO2 and CLO3 to A4/PLO4. These cognitive, psychomotor and affective domains organise the assessment of knowledge, skills and attitudes. Shared taxonomy labels and PLO mappings indicate curricular continuity, while the assessed project tasks differ between the two stages.

Table 1: Staged learning outcomes and programme outcome mapping

CLO / mapping	FYP I official statement	FYP II official statement
CLO1; C6; PLO1	Propose solutions based on evaluated issues or problems in industrial technology.	Arrange data to produce meaningful forms using relevant tools.
CLO2; P4; PLO2	Organise work activities and develop proposals for the implementation of the final year project.	Perform project implementation systematically.
CLO3; A4; PLO4	Defend ideas related to the project to evaluators in a more systematic way.	Defend the results in oral and written forms effectively.

Note. Official course mapping supplied by the programme. CLO1 wording shown is applicable from Cohort 2 onwards; the Cohort 1 wording is given in the text. Taxonomy and PLO labels are reproduced as supplied.

The FYP I CLO1 statement was refined from "Evaluate issues or problems in industrial technology and propose solutions" in Cohort 1 to "Propose solutions based on evaluated issues or problems in industrial technology" from Cohort 2 onwards. The programme clarification identifies this as a CQI refinement of wording, with the CLO–PLO mapping and assessment weightings retained. The revised statement places the proposed solution first while retaining evaluated industrial issues as its basis.

Mentoring responsibilities and monitoring

The programme handbook assigns academic guidance, learning plans, industry liaison, assessment, record keeping and periodic review to the faculty role. The JI role encompasses workplace training, resource access, safety, monitoring, assessment and university liaison (Fakulti Teknologi dan Kejuruteraan Elektrik, 2025).

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These complementary responsibilities describe the intended arrangement, rather than the frequency of its enactment. The faculty panel provides additional assessment and is distinct from the continuing faculty mentor.

The handbook also specifies a pre-project university–industry discussion of the problem, scope, site and activities, together with at least two online faculty–student meetings (Fakulti Teknologi dan Kejuruteraan Elektrik, 2025). Cohort schedules identify four visits: the second and third relate to FYP I and FYP II assessment, respectively, and the fourth to industrial training. These are planned monitoring opportunities; completed visit reports or meeting logs would be required to verify participation, discussion and follow-up. The corrected first-visit period for Cohort 3 is 17–28 March 2025.

Assessment responsibilities

The programme handbook allocates 50% of each FYP course mark to industry and 50% to faculty (Fakulti Teknologi dan Kejuruteraan Elektrik, 2025). Table 2 distinguishes supervisor and panel contributions within the faculty allocation. This arrangement accommodates judgements of workplace activity, written work and oral performance. Equal weighting, however, does not establish agreement between assessors or equivalent standards across companies.

Table 2: Assessment allocation specified in the supplied WBL guide

Assessor	FYP I components	FYP II components
Industrial coach	Project organisation 40%; general conduct 10%	Project organisation 40%; general conduct 10%
Faculty supervisor	Proposal 10%; report 15%; general conduct 5%	Report 20%; general conduct 5%
Faculty panel	Report 15%; presentation 5%	Report 20%; presentation 5%
Total	Industry 50%; faculty 50%	Industry 50%; faculty 50%

Note. Source: BELS WBL handbook (Fakulti Teknologi dan Kejuruteraan Elektrik, 2025), corroborated by the revised component schedule. TPF denotes Faculty Supervisor; JI denotes Industrial Coach.

Figure 1 synthesises the documented division of mentoring responsibilities, the successive project stages and the course-level reporting arrangements. It provides an overview of the organisational design examined in the case.

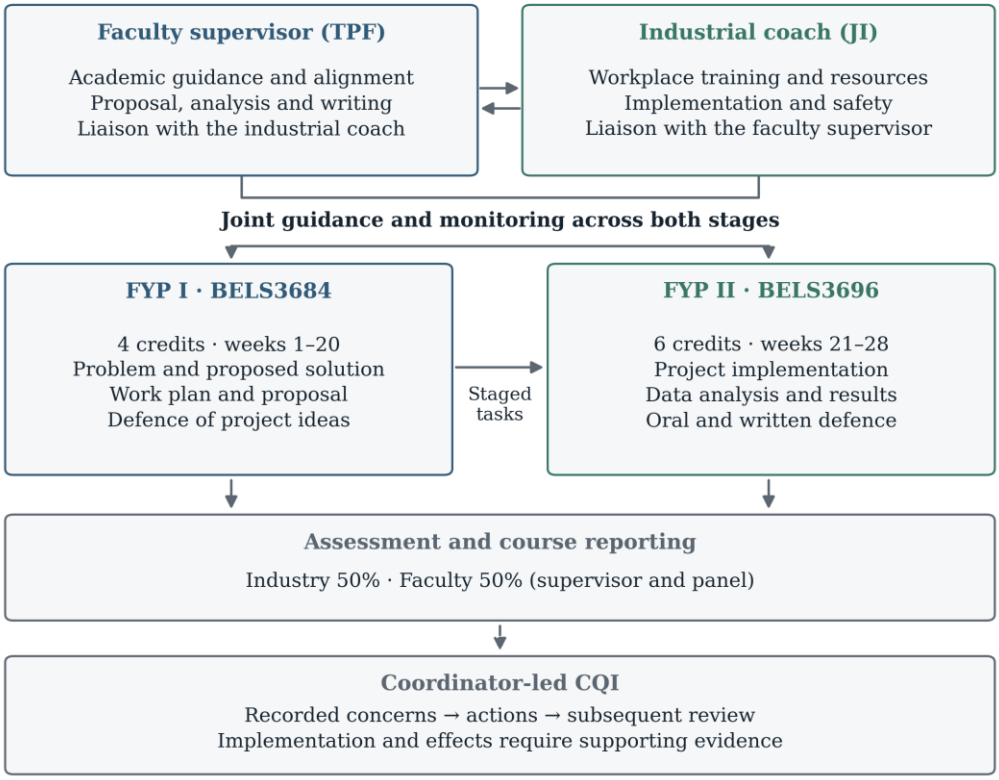


Figure 1: Documented design of staged dual mentorship in the BELS FYP sequence.

Note. Authors' synthesis of the programme handbook (Fakulti Teknologi dan Kejuruteraan Elektrik, 2025) and coordinator CQI records. The dashed arrow represents reporting to CQI; implementation and subsequent review require separate evidence.

METHODOLOGY

Design and boundaries

A retrospective documentary case study examined the organisation and documentation of BELS academic–industry dual mentorship at UTeM. The programme arrangement was the unit of analysis, with course and cohort records providing embedded descriptive evidence. The assessment dataset covered four successive cohorts and 107 students over the 2022/2023–2025/2026 sessions. The corpus included programme documents, the consolidated assessment workbook and programme clarifications received up to 23 October 2026. Numerical analysis covered all four cohorts to describe the available consecutive course records without selecting students on the basis of their marks.

Document analysis was appropriate because the research questions concern formal responsibilities, assessment mappings and recorded improvement processes. Following Bowen's (2009) discussion of documentary research, the analysis considered both the contribution and limitations of administrative records. These documents were produced for programme operation and were not treated as complete observations of mentoring. No interviews, direct observations or new student surveys were conducted.

Documentary corpus and evidence selection

Documents were selected purposively according to their relevance to the research questions and the assessment process. Eligible sources specified mentoring responsibilities or course outcomes; recorded assessment components, marks or supervision assignments; contained moderation or coordinator CQI entries; or clarified the administration and applicability of those records. Programme-level sources were retained for organisational interpretation, and student-level numerical summaries used the consolidated workbook as the authoritative numerical dataset. Duplicate historical extracts were not pooled with these records. Duplicate copies and

repeated entries were not counted as additional observations. Table 3 identifies source groups, coverage and analytical uses.

Table 3: Documentary evidence and analytical use

Source group	Coverage	Analytical use
Institutional and BELS WBL guidance; official CLO–PLO mapping	University and programme provisions	Case boundaries, responsibilities and curriculum
Assessment forms, component schedule and rubric examples	Common weights; Cohort 1 and Cohorts 2–4 scale formats	Assessor roles, criteria and version changes
Revised consolidated assessment workbook	107 linked students: 21 / 29 / 26 / 31	Component checks and eight course–cohort summaries
Supervision and moderation registers	Available Cohorts 1–4 registers; Cohort 4 moderation	Assignments, cohort reconciliation and guidance examples
Coordinator performance and CQI reports	FYP I: 2023/2024, 2025/2026; FYP II: 2023/2024, 2024/2025	Concerns, reported actions and future intentions
Schedules, assessment-feedback summary and programme clarifications	Available administrative context and explanations	Planned monitoring, feedback channels and applicability; no inferred response effects

Note. Source inventory summarises the materials used for this revision. Programme clarifications establish administrative context; their status is distinguished from directly inspected assessment records.

The moderation workbook contained 31 Cohort 4 students and one student originally belonging to Cohort 3 who deferred FYP I to semester 2 of 2026/2027 with Cohort 5. The latter record was excluded from Cohort 4 denominators. Four repeated entries on an auxiliary sheet were not counted again. A separate distinction was maintained between FYP company and subsequent industrial-training company where a placement changed. Such exceptions were retained as reconciliation rules without publishing personal identities.

The assessment-feedback survey summary was retained as contextual evidence that an industry-feedback mechanism existed. It was not used to estimate BELS-specific respondent proportions or infer cohort-wide satisfaction because individual eligibility and unique responses could not be verified from the summary. Programme explanations were treated as clarifications of document administration and version applicability, rather than independent observations of mentoring. Selection therefore followed evidential relevance and interpretability, rather than whether a source reported favourable outcomes.

Assessment administration and institutional governance

According to the programme clarification, assessment responses are submitted by JI, TPF and panels through Google Forms or Microsoft Forms. Faculty-appointed FYP I and FYP II coordinators check, record and update the submissions each academic session. Digital forms, declarations and associated documents remain under coordinator control and faculty WBL committee verification. Assessment requirements are explained to assessors and students at the beginning of the semester. Marks are entered into Sistem Maklumat Pelajar (SMP) OBE, which generates CLO and PLO achievement reports. Results pass through departmental review and the Faculty Examination Results Committee before Senate confirmation. These procedures describe the administrative chain of responsibility; the research did not independently audit every submission or committee decision.

The programme describes this document-control arrangement as operating within the university quality-management system and the OBE framework, with reference to TTAC-MBOT and Level 6 expectations. These statements are reported as programme context, rather than a separate certification or compliance finding.

Formal standards compliance, the scope of ISO certification and the equivalence of individual rubric items were not independently assessed in this study.

Analytical procedures

Document analysis followed an explicit extraction and comparison sequence informed by Bowen (2009). First, each source was identified by its course, session, purpose and available version information. Second, relevant content was extracted under mentoring responsibilities, staged project demands, assessment allocation, moderation, governance and CQI. Third, each item was classified as a prescribed arrangement, assigned responsibility, recorded activity, reported implementation or documented follow-up. Fourth, sources were compared to identify continuity, revisions and gaps. Finally, findings were organised against the three research questions. Moderation examples were selected to illustrate measurable project objectives and industrial-consultation requests; they are anonymised paraphrases, not representative estimates of all mentoring.

Numerical analysis used the seven FYP I component columns and four FYP II component columns in the revised workbook. Course totals were recalculated by summing the recorded weighted marks; no rescaling, imputation or replacement of low values was undertaken. All component values were within their stated maxima. Student identifiers were checked for duplication and matched across course sheets within each cohort, yielding 107 linked records and 214 course records. Three low Cohort 2 FYP I TR-3 values (1.58, 1.32 and 1.34 out of 10) were confirmed as valid industrial-coach conduct marks and retained. Their causes were not inferred. Means, sample standard deviations, medians, observed ranges and counts within the confirmed Grade A interval of 80–100 were calculated from unrounded totals.

Results were summarised separately by course and cohort. Matching ensured that the same student records could be traced across the two stages; it did not establish equivalent measurement of learning. No pooled course average, learning-gain estimate or paired significance test was used. Cohort 1 was distinguished from Cohorts 2–4 because the rubric scale changed. Aggregate CLO–PLO attainment was not recalculated: the official mapping supplied here establishes CLO–PLO relationships but does not provide an independently verified component-to-CLO weighting schedule or attainment threshold. Automatically generated institutional attainment entries were therefore not substituted for the verified course-mark analysis.

Credibility and ethical handling

Credibility checks comprised verification of component maxima, recalculation of totals, matching of identifiers, reconciliation of cohort counts and comparison of the assessment structure with the supplied programme explanations. Administrative verification by course coordinators and examination committees was distinguished from research validation. The documentary analysis did not include independent double coding, member checking or an inter-rater agreement study. Several sources originated within the same institutional system, so their agreement supports internal traceability rather than fully independent corroboration. Where a clarification established how documents were administered but no linked student response was available, that distinction was retained. The account is based on programme records and explanations supplied by personnel involved in their administration; this proximity provides contextual knowledge but may introduce institutional perspective into interpretation.

Permission to use the actual assessment data for anonymised publication was confirmed by the data provider. Reporting excludes student, JI and TPF names, matriculation numbers, contact details and identifiable industrial information. Linkage identifiers were used only during checking and were not included in outputs. Existing assessment declarations form part of the administrative record and are not assumed to constitute research consent.

FINDINGS

Responsibilities and supervision are documented across successive stages

The handbook organises dual mentorship through complementary academic and industrial responsibilities, with faculty-panel assessment providing an additional evaluative role. FYP I establishes a proposal-development stage, followed by implementation in FYP II. Supervision registers record the assignment of faculty responsibilities, while the moderation workbook records specific guidance on project formulation. These sources document different aspects of the arrangement: the handbook specifies intended practice, registers identify responsibility, and comments record instances of academic input.

The later moderation register contained comments for 28 of 32 unique records. Excluding the deferred Cohort 3 student left comments for 27 of 31 Cohort 4 records (87.1%), with four blank comment fields. This percentage measures documented comment coverage. Blank fields do not establish an absence of guidance, and populated fields do not establish student uptake.

Table 4 presents two anonymised examples of recorded moderation. The first connects measurable academic objectives with a request for industrial consultation; the second translates broad project aspirations into design, implementation and evaluation tasks. These examples show how the documentation captures the faculty contribution and, in one case, a referral to JI. Neither example includes a linked record confirming the subsequent industrial response or student revision.

Table 4: Anonymised examples of recorded faculty moderation

Example	Issue in the proposal	Recorded faculty guidance	Documented link to JI
A: Monitoring project	Objectives did not clearly reflect the sensing approach and fault-detection purpose.	Define measurable outputs and parameters; make the proposed technical work explicit.	Further discussion with JI requested to align objectives with suitable measurable parameters.
B: Digital monitoring project	Broad operational-management aspirations were not expressed as workable project tasks.	Reframe objectives around designing, implementing and evaluating the proposed monitoring system.	No explicit JI consultation request in the selected comment.

Note. Paraphrased from the MODERASI sheet of the Cohort 4 supervision workbook. Examples were selected to illustrate types of recorded guidance, not their prevalence. Identifying details are omitted. Proposed revisions and consultation requests are not treated as completed student actions or confirmed JI responses.

Assessment continuity and documented CQI revisions

The revised component schedule confirms the same assessor allocation across all cohorts: JI contributes 50%, and the faculty supervisor and panel together contribute 50%. In FYP I, the JI allocation comprises project organisation (40%) and conduct (10%); the faculty allocation comprises the proposal (10%), two report assessments (15% each), supervisor conduct (5%) and panel presentation (5%). In FYP II, JI contributes project implementation (40%) and conduct (10%); faculty contributes the report (20% supervisor and 20% panel), supervisor conduct (5%) and presentation (5%). FYP II conduct is stored as a combined 15-mark field and report assessment as a combined 40-mark field, so the revised workbook alone cannot separate the constituent assessor marks.

Table 5: Cohort coverage and assessment-version comparison

Cohort / n	FYP I / II sessions	Rubric scale	Stable provisions and revision
1 / 21	Semesters 2 / 3, 2022/2023	0–3	JI 50%; faculty 50%; common component weights and CLO–PLO mapping; original CLO1 wording

Cohort / n	FYP I / II sessions	Rubric scale	Stable provisions and revision
2 / 29	Semesters 2 / 3, 2023/2024	0–10	Same allocation and mapping; refined FYP I CLO1 wording
3 / 26	Semesters 2 / 3, 2024/2025	0–10	Same allocation, mapping and refined wording
4 / 31	Semesters 2 / 3, 2025/2026	0–10	Same allocation, mapping and refined wording

Note. Sources: revised assessment workbook, official course mapping and programme clarification of cohort sessions and rubric applicability. The 0–10 descriptor includes zero for inability to demonstrate performance. Cohort 1 and later rubric examples concern different items.

Table 5 distinguishes stable assessment provisions from CQI revisions. Cohort 1 used a 0–3 rubric scale; Cohorts 2–4 used a finer 0–10 scale. Although the latter was described administratively as 1–10, the supplied descriptor includes zero for inability to demonstrate the assessed performance. It is therefore reported as 0–10. The examples supplied for the two scales concern different items and are used to illustrate scoring formats, not to establish item-by-item equivalence.

For illustration, the later Task Planning item groups scores into excellent (9–10), good (6–8), fair (3–5) and poor (1–2) performance, with zero for inability to plan. Its descriptors distinguish planning detail and the degree of industrial-coach guidance required. The earlier Identification of Problem example uses scores of 3, 2, 1 and 0 to distinguish excellent, fair, very limited and absent evidence. These examples demonstrate differences in scoring granularity and descriptor content across the supplied formats; they are not the same item measured twice.

Achievement records as supporting context

Table 6 summarises complete course totals for all four cohorts. Every listed student has numerical component marks in both course sheets. FYP I means range from 74.31% in Cohort 3 to 83.16% in Cohort 1; FYP II means range from 74.68% in Cohort 3 to 87.44% in Cohort 1. These are differences in recorded assessed performance. The data do not isolate the contributions of prior attainment, project complexity, company setting, assessor judgement or mentoring activity.

Table 6: Recalculated course achievement by cohort

Cohort / course	n	Mean (SD), %	Median, %	Range, %	Grade A, n (%)
1 / FYP I	21	83.16 (7.38)	85.50	63.60–95.10	15 (71.4)
1 / FYP II	21	87.44 (5.76)	88.90	68.70–94.60	20 (95.2)
2 / FYP I	29	82.81 (5.54)	83.00	70.72–92.40	20 (69.0)
2 / FYP II	29	84.12 (6.87)	85.71	62.85–94.73	24 (82.8)
3 / FYP I	26	74.31 (11.17)	75.44	40.05–91.49	9 (34.6)
3 / FYP II	26	74.68 (13.04)	80.30	40.66–88.90	14 (53.8)
4 / FYP I	31	81.23 (7.39)	82.23	65.32–94.10	21 (67.7)
4 / FYP II	31	84.34 (5.28)	84.50	71.80–95.40	26 (83.9)

Note. n denotes students with all listed course components. SD is the sample standard deviation. Grade A denotes an unrounded total of 80–100, as confirmed by the programme data provider. All statistics were calculated directly from component values in Pembahagian_Markah_PSM1_dan_PSM2.xlsx. Figures describe course assessment records, not standardised learning gains.

Figure 2 presents the two course distributions within each cohort. Individual observations, medians, means and observed ranges show variation that would be concealed by a single programme average. Cohort 1 is labelled separately because its rubric scale differed from that used in Cohorts 2–4.

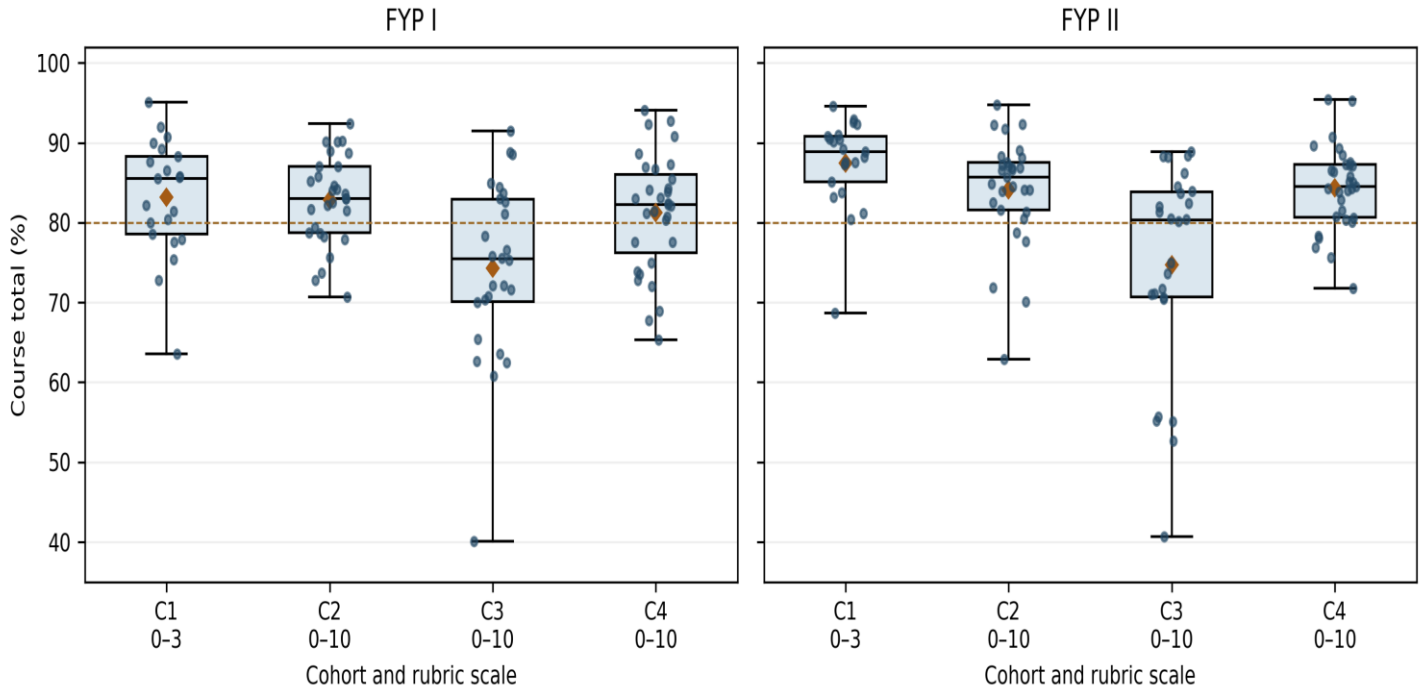


Figure 2: Course-mark distributions across four cohorts.

Note. Authors' calculations from the revised assessment workbook. Dots represent individual course totals; boxes span the interquartile range, lines indicate medians, diamonds indicate means and whiskers show observed minima and maxima. The horizontal line marks 80%, the lower boundary of Grade A. Cohort 1 used a 0–3 rubric and Cohorts 2–4 used a 0–10 rubric; a common percentage axis does not establish measurement equivalence.

Cohort 2 contributed 29 complete totals per course, with means of 82.81% for FYP I and 84.12% for FYP II. Three low conduct marks confirmed by the data provider were included under the same rules as all other numerical values. Their retention preserves the recorded variation without assigning unsupported explanations for individual results.

SMP OBE generates CLO and PLO achievement reports from entered assessment data, according to the programme clarification. Such reports document institutional outcome monitoring, but course totals and Grade A counts are not interchangeable with CLO or PLO attainment. This study reports the verified course totals and official outcome relationships without claiming an independently established outcome-attainment rate.

Coordinator CQI documented concerns and responses

The course coordinator prepared the CQI entries at course level; they are not individual JI evaluations. Table 7 summarises the available records, distinguishing reported actions from intentions for the next session. Recurring concerns involve writing, communication and the management of project responsibilities.

Table 7: Available course-level CQI evidence

Course and session	Concern or recommendation	Recorded response and evidence status
FYP I, 2-2023/2024	More regular faculty progress reviews and feedback	Peer review to support writing appears under action taken; no outcome evaluation attached
FYP II, 3-2023/2024	More regular project discussion with the faculty supervisor	A report-writing module appears under action taken; delivery and effect not independently verified
FYP II, 3-2024/2025	Difficulty balancing company duties and project completion	Regular discussion with TPF and JI entered under next-session action; treated as prospective
FYP I, 2-2025/2026	Writing and articulation of project ideas	Writing, idea development and ethical AI guidance reported as incorporated; structured activities and examples proposed next
FYP I, Cohort 2 onwards	CLO1 wording refined	Programme clarification confirms revised wording; mapping and weights retained
Both courses, Cohorts 2–4	Rubric expanded from 0–3 to 0–10	Programme clarification and descriptor examples; finer grading intended, improved accuracy not demonstrated

Note. The first four entries summarise coordinator course reports. The final two entries record programme-confirmed CQI revisions and the supplied descriptor examples; no improvement in scoring accuracy is inferred.

Coordinator reports record recurring concerns about writing, communication and the coordination of project work with company duties. Programme clarifications additionally identify two implemented CQI revisions: the FYP I CLO1 wording and the rubric scale from Cohort 2 onwards. These are identifiable changes in the assessment design. They do not establish that writing improved, that feedback was acted upon in every project or that scoring accuracy increased. Table 7 separates recorded course actions from the additional version changes confirmed for this revision.

DISCUSSION

Organisation through complementary roles and staged tasks

The case shows that dual mentorship is organised through the combination of complementary responsibilities, successive project stages and distributed assessment. Faculty guidance addresses academic formulation and reporting, while the industrial role situates the project within workplace resources, activities and constraints. The additional panel contributes to assessment without replacing either continuing mentor. This distinction clarifies how the arrangement extends beyond allocating marks between two parties.

This organisational structure is consistent with Billett's (2002) emphasis on guidance and access to participation, and with the purposeful university–company coordination discussed by Díaz et al. (2026). The documentary contribution is to show where these responsibilities become visible: in programme guidance, supervision assignments, assessment allocations and moderation comments. Their distribution across several records also explains why no single source provides a complete account of implementation. A register identifies who is responsible; a comment or agreed decision is needed to document what that responsibility involved in a particular project.

Assessment continuity, rubric refinement and comparability

FYP I and FYP II organise the project around distinct expectations, from specifying a feasible proposal to implementing and defending its results. This sequence provides an organisational basis for the structured support discussed by MacLeod and van der Veen (2020). The course-specific statistics describe the

assessments associated with these stages. Keeping those statistics separate preserves the meaning of the tasks and avoids treating successive course marks as interchangeable measures.

Constructive alignment requires intended outcomes, tasks and assessment judgements to remain connected (Biggs, 1996). Here, the same CLO–PLO relationships and component weightings were maintained while the FYP I CLO1 wording and rubric scale were refined. The revised wording retains evaluation of industrial problems as the basis for proposing solutions. The scale expansion offers more score choices within performance bands, but this granularity does not itself demonstrate greater accuracy, fairness or inter-rater reliability. Evidence of assessor calibration, comparable anchor work or repeated scoring would be needed to evaluate those properties. Accordingly, the common 50:50 allocation supports continuity of responsibility, while the scale change limits strong comparisons of achievement across the Cohort 1 boundary.

Moderation records make guidance visible

The sample moderation records illustrate how faculty guidance translates workplace project ideas into assessable objectives. Requests for measurable outputs and workable tasks create a record of the academic contribution. Where consultation with JI is requested, the comment also identifies a point at which industrial feasibility should inform project refinement. However, as Carless and Boud (2018) explain, the provision of feedback and its uptake are distinct. The present records capture the first more clearly than the second.

A linked record of the proposal, moderation comment, industrial response and revised decision would make the subsequent process easier to examine. This need not capture every informal interaction. Recording consequential changes to scope, resources, testing parameters or milestones would provide a proportionate account of how academic and industrial advice is reconciled. Such documentation would strengthen future case analysis while supporting continuity when supervisors or workplace personnel change.

Coordinator reporting provides a record of CQI

Coordinator reporting and feedback channels provide a route for revising assessment practice. The confirmed changes to CLO1 wording and rubric scale show that CQI extended to the assessment instruments, while component weightings and CLO–PLO relationships remained stable. The programme also collects comments from JI, TPF and panels and has used online assessment-feedback surveys. These mechanisms support review; the available survey summary does not establish that a particular response caused a specific revision. As with learner feedback (Carless & Boud, 2018), recording input and establishing its subsequent effect remain distinct analytical tasks.

The distinction between a planned action, reported implementation and subsequent review is particularly useful for interpreting these entries. A stronger documentary sequence would identify the concern, responsible person, action, implementation record and review criterion. For example, writing support could be followed by a review of selected reports against consistent criteria; workload coordination could be followed through agreed milestones and reasons for delay. These are recommendations arising from the available documentation, rather than claims that such follow-up has already occurred.

Contribution and transferability

Building on the earlier BELS FYP account (Zakaria et al., 2025), this study describes how mentoring roles connect with digital assessment submission, coordinator verification, institutional reporting and CQI. The expanded dataset covers four successive cohorts and avoids basing achievement context on a single selected cohort. Its contribution remains analytical and practical: the distinction between prescribed arrangements, recorded actions and follow-up can inform documentary review in comparable programmes. The 107 students constitute records nested within one programme, not 107 independent tests of the mentoring model. Statistical generalisation to Malaysian TVET is therefore not claimed.

CONCLUSION

Academic–industry dual mentorship in BELS is organised through complementary faculty and industrial responsibilities, successive proposal and implementation stages, and a stable 50:50 industry–faculty assessment allocation. The four-cohort documentary account connects these responsibilities with digital submission, coordinator management, examination review and course-level CQI. Official outcome mappings provide curricular continuity, while refinements to CLO1 wording and rubric scoring illustrate how assessment instruments evolved.

The 107 linked student records provide complete numerical component coverage in the revised workbook and a broader descriptive context than the earlier single-cohort analysis. Achievement varies across courses and cohorts, but those differences cannot establish mentoring effectiveness or the benefits of rubric refinement. The practical contribution is an account of the governance and records through which joint mentoring becomes visible. Preserving effective rubric versions, documenting consequential responses to moderation and linking CQI actions to subsequent review would strengthen continuity and future evaluation without requiring every informal mentoring interaction to be recorded.

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REFERENCES

1. Biggs, J. (1996). Enhancing teaching through constructive alignment. Higher Education, 32(3), 347–364. https://doi.org/10.1007/BF00138871
2. Billett, S. (2002). Toward a workplace pedagogy: Guidance, participation, and engagement. Adult Education Quarterly, 53(1), 27–43. https://doi.org/10.1177/074171302237202
3. Bowen, G. A. (2009). Document analysis as a qualitative research method. Qualitative Research Journal, 9(2), 27–40. https://doi.org/10.3316/QRJ0902027
4. Carless, D., & Boud, D. (2018). The development of student feedback literacy: Enabling uptake of feedback. Assessment & Evaluation in Higher Education, 43(8), 1315–1325. https://doi.org/10.1080/02602938.2018.1463354
5. Díaz, B., Delgado, C., Han, K., & Lynch, C. (2026). A scaffolding model for designing and implementing work-integrated learning experiences based on the analysis of the university and company's arrangements. Higher Education, 91(2), 781–804. https://doi.org/10.1007/s10734-025-01442-y
6. Fakulti Teknologi dan Kejuruteraan Elektrik. (2025). Buku panduan perlaksanaan work based learning (WBL): Sarjana muda teknologi penyelengaraan sistem elektrik dengan kepujian [Work-based learning implementation handbook: Bachelor of Technology in Electrical System Maintenance with Honours] (2nd ed.). Universiti Teknikal Malaysia Melaka.
7. MacLeod, M. A. J., & van der Veen, J. T. (2020). Scaffolding interdisciplinary project-based learning: A case study. European Journal of Engineering Education, 45(3), 363–377. https://doi.org/10.1080/03043797.2019.1646210
8. Sabikan, S., Jamil, A. Z., Zakaria, Z., Ali, M. Y., Din, A., & Safie, N. E. (2025). Work-based learning outcomes in TVET: Findings from the exit survey of Bachelor of Technology in Electrical System Maintenance. International Journal of Research and Innovation in Social Science, 9(8), 5681–5693. https://doi.org/10.47772/IJRISS.2025.908000461
9. Universiti Teknikal Malaysia Melaka. (2022). Peraturan dan garis panduan pelaksanaan pembelajaran berasaskan kerja (WBL) di UTeM [Regulations and guidelines for implementing work-based learning at UTeM]. https://pppa.utem.edu.my/index.php/senarai-dasar-polisi-dan-garis-panduan-yang-berkaitan-akademik/jpt

10. Zakaria, Z., Din, A., Jamil, A. Z., Ali, M. Y., Sabikan, S., & Jaafar, R. (2025). Work-based learning: Final year project outcomes in Bachelor of Technology programme at Universiti Teknikal Malaysia Melaka. International Journal of Research and Innovation in Social Science, 9(3S), 5723–5730. https://doi.org/10.47772/IJRISS.2025.903SEDU0415