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Conceptual Article

Outcome-Based Redesign of an International Supply Chain and Trade Course: Authentic Tasks, Individual Evidence, and Assessment Rubrics

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Abstract

Background: International supply chain and trade courses require learners to connect sourcing, transport, contractual delivery, payment, documentation and risk rather than recall isolated definitions. Purpose: This paper develops a course-level outcome-based education (OBE) design that links interdisciplinary business tasks to observable and individually attributable learning evidence. Methods: A design-oriented curriculum analysis synthesized OBE, constructive alignment, authentic assessment, rubric research and feedback theory. The analysis specified course learning outcomes, mapped them to tasks and evidence, and constructed an assessment and improvement protocol. No student performance data were analyzed. Design results: Four outcomes address business-process analysis, fulfilment verification, alternative decision making, and communication with professional responsibility. A staged cross-border order project joins independent process mapping, document checking, solution comparison, team synthesis and individual oral defence. The proposed grade structure assigns 60% to process work and 40% to a final individual assessment, while a separate outcome-attainment model prioritizes individual evidence. A four-level analytic rubric and an evidence-to-action protocol provide practical criteria for scoring, diagnosis and course revision. Implications: The framework offers a transparent way to link authentic business decisions with evaluable learning outcomes without confusing team performance with individual competence. It remains a design proposition: future classroom cycles must test feasibility, scoring reliability and learning effects.

Keywords

Outcome-based education, International trade education, Supply chain learning, Authentic assessment, Curriculum design, Learning outcomes, Performance rubrics

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1. Introduction

International supply chain and trade education occupies an inherently interdisciplinary space. Students are expected not only to understand isolated concepts such as procurement, inventory, transportation, trade terms, payment methods, and shipping documents, but also to use these concepts jointly when making decisions about a continuous cross-border transaction. A change in a contractual term can alter the allocation of cost and risk; a transportation decision can change delivery time, inventory exposure, and cash-flow requirements; and inconsistencies across commercial or logistics documents can affect settlement and fulfilment. The educational challenge is therefore less about covering a long list of topics and more about helping students integrate knowledge across linked business processes.

A conventional course structure organized mainly around textbook chapters can obscure this integration. Students may perform well on concept quizzes while remaining unable to explain how purchasing, transportation, delivery, payment, documentation, and risk interact in one order. Broad course objectives such as "understand supply chains" or "master international trade procedures" provide useful thematic direction, but they do not specify what students should be able to produce or demonstrate. When objectives remain abstract, assessment often defaults to aggregate scores that indicate overall performance but provide little evidence about which capability has or has not been attained.

A second challenge concerns the evidential basis of course assessment. Comprehensive business projects are often completed in teams because teamwork resembles professional practice and makes complex tasks manageable. However, a team score is not sufficient evidence that every student can independently analyze a process, verify a transaction, calculate alternatives, or defend a decision. In addition, a single total course grade can conceal large differences between capabilities. A student who performs strongly in calculations but weakly in document verification may receive the same overall score as a student with the opposite profile. For curriculum improvement, these profiles require different teaching responses.

Outcome-based education (OBE) begins with performances students are expected to demonstrate, rather than with a list of topics to be taught [1, 2]. Constructive alignment requires congruence between these performances, the learning activities that elicit them, and the assessments used to judge them [3]. Backward design adds a pragmatic sequence: specify desired results, determine convincing evidence, and then plan instruction [4]. For a cross-border business course, the challenge is to turn these principles into observable, individually attributable evidence without fragmenting an integrated workflow.

This article presents a design-oriented study of an International Supply Chain and Trade course

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situated within economics and management higher education. It asks three questions: (RQ1) Which observable outcomes capture the cross-functional capabilities expected in a cross-border order? (RQ2) How can an authentic order-fulfilment project align teaching activities and evidence for each outcome? (RQ3) How can individual attainment and continuous improvement be reported without treating team scores as individual competence? The contribution is a traceable learning-outcome–task–evidence framework, not a claim that student achievement has already improved.

2. Theoretical Frameworkn

2.1. Observable learning outcomes and backward alignment

For a single course, an outcome becomes useful only when it can guide both learning activities and judgment. Statements such as "understand international supply chains" are difficult to assess because the verb does not identify observable performance. By contrast, an outcome that requires students to map an order-fulfilment process, identify constraints, compare alternatives, verify consistency, calculate cost and time, or justify a recommendation leaves a record that can be examined. The practical value of OBE therefore depends on the quality of outcome specification, not merely on whether OBE terminology appears in the syllabus.

Constructive alignment provides the second theoretical foundation. Biggs [3] argues that intended outcomes, teaching and learning activities, and assessment should be aligned so that students are encouraged to engage in the performances that the course values. Alignment is particularly important when a course aims at higher-order performance. If an outcome requires students to compare alternative fulfilment solutions under constraints, a lecture on terminology and a multiple-choice examination are not sufficient. Students need opportunities to perform the comparison and produce evidence of the reasoning used.

Backward design offers a complementary planning sequence. Wiggins and McTighe [4] propose beginning with desired learning results, identifying acceptable evidence, and then planning learning experiences. Applied to the present course, this sequence means defining what competent order-fulfilment performance looks like, determining which student products or actions would demonstrate that performance, and only then organizing lectures, demonstrations, practice, feedback, and projects. This prevents assessment from being added after teaching as a disconnected final step.

The OBE perspective is also used in Chinese higher education as a basis for measurable course targets and attainment analysis [5, 6, 7]. Its cross-disciplinary adaptation, however, requires disciplinary judgment: an outcome labelled 'decision-making ability' is not operational until a student can identify constraints, compute alternatives, and justify trade-offs under explicit case assumptions.

2.2. Authentic project tasks and individual performance

Authentic assessment is relevant when learning outcomes involve professional or quasi-professional performance. Gulikers and colleagues [8] conceptualize authenticity through relationships among the assessment task, physical and social context, assessment result or form, and assessment criteria. For a business course, authenticity does not require access to a complete live company operation. A carefully constructed case can preserve the decision relationships that matter educationally, such as trade-offs among price, delivery time, risk, documentation, and service, while controlling the amount and sensitivity of information available to students.

Project-based learning can give students an integrated problem that unfolds over several sessions [9], while active learning makes students undertake the reasoning rather than merely listen to a demonstration [10]. In this setting, a team proposal is a legitimate collaboration product, but it is insufficient evidence of each person's analytical ability. Individual process maps, checking logs, calculation sheets and oral defence must therefore accompany the integrated task.

2.3. Rubrics, feedback and evidence-informed improvement

A rubric is informative only if its criteria correspond to the capability being assessed and its performance levels describe observable differences [11, 12, 13]. For this course, criteria cover process linkage, consistency checking, calculation and risk-based justification, and communication with evidence traceability. Vague descriptors such as 'good work' are replaced with specified features of student submissions.

Formative assessment should allow students to compare their work with transparent criteria and revise it accordingly [14, 15]. Feedback is useful when it indicates a goal, the present gap, and a productive next step [16, 17]. Student feedback literacy further requires making sense of comments and acting upon them [18]. Consequently, the proposed project retains drafts, feedback and revisions, and the course evaluation uses weaknesses in the actual artifacts to determine the next instructional action.

3. Materials And Methods

3.1. Design-oriented study and evidence boundary

This is a curriculum and assessment design study, not an implemented experiment or a statistical evaluation. The source material was an existing course-reform manuscript specifying the interdisciplinary problem, a four-outcome scheme, a staged cross-border order task, and possible evidence weights. The present analysis restructures that design in light of established work on OBE, alignment, authentic assessment, rubrics and feedback. Design-based research scholarship situates educational design within cycles of theory, artifact construction and practical testing [19]; however, the present study reports the design stage only and does not claim to have completed field trials or

validation cycles.

Four design inputs were specified: (a) the learning demands of a course linking supply chain and trade operations; (b) a coherent cross-border order scenario with contracting, sourcing, logistics, delivery, settlement and documentation constraints; (c) the requirement that outcome scores be attributable to individual work; and (d) the need to convert assessment evidence into actionable teaching decisions. No real student grades, interviews, surveys, employer records or company transactions were supplied or analyzed.

3.2. Reproducible design procedure

To make the course-design procedure auditable, a course team should maintain a planning record with four columns: (i) the proposed outcome verb and specified business context; (ii) the student action that would reveal the outcome; (iii) the tangible artifact or observable behaviour; and (iv) the relevant rubric descriptor. When one of these columns cannot be populated, the activity or outcome should be reconsidered. This rule prevents an attractive classroom activity from becoming an assessment that is disconnected from the stated target. It also clarifies that the same integrated case can elicit evidence for multiple outcomes as long as the corresponding assessment criteria are disaggregated.

The study's design-validation logic is deliberately modest. Content coherence can be reviewed by course instructors and international-trade practitioners using the outcome–task matrix and the business case brief. Reviewers can check that the case supplies enough information to make the decisions requested of students, that documentary discrepancies are intentional rather than accidental, and that the workload is consistent with scheduled teaching time. Such review would establish face and content plausibility, not observed measurement validity. Any claim of instrument reliability or educational gain would require scores obtained after actual implementation.

The design procedure has five steps. First, translate broad programme expectations into four observable course learning outcomes (CLOs). Second, build an outcome–task–artifact matrix and identify gaps where an outcome has no direct evidence. Third, construct a multi-stage order-fulfilment project with scaffolding, checkpoints and individual deliverables. Fourth, specify both course-grade weights and a separate, individually interpretable CLO-attainment model. Fifth, define rubric calibration, diagnostic categories and comparable reassessment tasks for the next teaching cycle.

Internal design consistency is examined through an alignment audit: for every CLO, at least one appropriate performance task, individual artifact, criterion and feedback opportunity must be identifiable. This audit is a design check, not an external validity test. The reported results therefore comprise specified curricular artifacts, assessment rules and a future evaluation protocol rather than observed learning gains.

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4. Design Results

4.1. Four measurable course learning outcomes

The design produces four course learning outcomes (CLOs): business-process analysis, fulfilment operations, solution decision making, and communication and professional responsibility. The outcomes are intentionally related but non-redundant. Together, they represent the progression from understanding an order as a connected system, through checking operational feasibility, to comparing alternatives and defending a responsible decision.

Table 1

Outcome–task–individual evidence alignment

Course learning outcome	Typical task	Student artifact	Assessment focus
CLO1 Business-process analysis	Map a cross-border order process and explain links among logistics, cash flow, and information flow.	Individual process map and case analysis	Process completeness, key relationships, identification of constraints, and quality of explanation
CLO2 Fulfilment operations	Verify transaction, transportation, payment, and document arrangements in a defined case.	Individual verification checklist and error log	Information consistency, rule application, error location, and explanation of operational consequences
CLO3 Solution decision making	Compare at least two sourcing/transportation/fulfilment alternatives under cost, time, and risk constraints.	Calculation worksheet, risk register, and written recommendation	Explicit assumptions, calculation reliability, alternative comparison, risk response, and recommendation logic
CLO4 Communication and professional responsibility	Defend a business decision, respond to questions, verify sources, and reflect on responsibility for fulfilment consequences.	Individual oral defence and reflection record	Evidence-based communication, source traceability, response quality, integrity, and responsibility judgment

CLO1 targets systems thinking across material, money and information flows. CLO2 requires the operational detection and explanation of inconsistencies between transaction requirements and fulfilment documents. CLO3 targets explicit comparison of sourcing and transportation options using cost, time, uncertainty and risk. CLO4 calls for evidence-based communication, source verification and responsible professional judgment. The four outcomes are interconnected, but their scores should remain interpretable at the level of a distinct performance.

4.2. Cross-border order-fulfilment project

A complete teaching brief should distinguish mandatory constraints from decision variables. Mandatory constraints might include a contractual delivery window, customer-specified document fields, an agreed payment condition and a requirement to disclose the applicable trade term. Decision variables might include supplier selection, consolidation, transport mode and a reasonable buffer against delay. Students must first state which options are feasible under the mandatory constraints and only then compare the feasible alternatives. This avoids the common error of selecting the lowest nominal price without considering whether the order could be performed.

The proposed artifact package contains six linked but independently checkable files: a process map, an annotated contract-and-document checklist, an assumptions register, a calculation sheet, a risk register and a recommendation memo. For example, the calculation sheet should identify every cost category included in the comparison and prevent double counting of freight or insurance. The risk register should distinguish an identified hazard, its plausible consequence and the student's proposed mitigation. The recommendation memo should point to these supporting artifacts rather than introduce unsupported new figures. Teachers may standardize templates while leaving the substantive choices open to students.

Course content is reorganized into four business-process modules rather than taught only as a sequence of textbook chapters. The modules create a progression from system understanding to operational execution, decision analysis, and integrated application.

Table 2

Modules, learning activities and evidence

Module	Core content	Learning activities	Primary evidence
Module 1: Foundational analysis	Global supply chain structure, key actors, cross-border order flow, logistics/cash/information relationships	Process mapping, constraint identification, short case explanation	Individual process map and annotated case notes

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Module 2: Business fulfilment	Trade terms, transportation arrangements, payment methods, documentation, information consistency	Document checking, error diagnosis, fulfilment consequence analysis	Verification checklist and error log
Module 3: Solution decision making	Sourcing, inventory, transportation, delivery, cost, time, uncertainty and risk	Alternative design, cost/time calculation, sensitivity check, risk response	Calculation worksheet, risk register, recommendation memo
Module 4: Integrated application	Full order-fulfilment scenario and professional communication	Team solution integration, individual oral defence, revision, reflection	Team proposal plus individual defence and reflection

The anchor task is an order placed by an overseas buyer with a manufacturer that must select suppliers and a transport route under contractual delivery, budget and risk constraints. Teachers supply a controlled brief containing order details, quotations, trade and payment terms, transport lead times, document templates and explicit cost assumptions. Students compare at least two feasible fulfilment solutions. The task must not imply that a fictional case represents an actual company transaction.

Five sequential checkpoints structure the assignment: (1) an independent order-process map and identification of critical handoffs; (2) an individual consistency audit of purchase, transport and settlement documents; (3) an independently evidenced cost–time–risk comparison and written recommendation; (4) a collaborative proposal followed by individual questioning; and (5) revision of the proposed solution using rubric-specific feedback. The group artifact supports collaboration, while individually attributable records permit separate judgments of competence.

For example, a student deciding between a lower-cost/slower route and a higher-cost/faster route must state what charges are included in the estimated delivered cost, explain whether both meet the promised delivery window, identify disruption risks, and indicate which assumptions would reverse the recommendation. The required output is a transparent decision chain, not a predetermined option. Actual numerical case inputs should be fixed and disclosed in the teaching materials before implementation.

4.3. Assessment weights and individual attainment

The marking blueprint should be issued before the case begins. A process map is assessed for

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correct ordering and interpretation of flows rather than visual decoration; a verification checklist is assessed for detection and explanation of discrepancies; a calculation sheet for assumptions, consistent units and sensible treatment of uncertainty; and an oral defence for evidence-based reasoning under questioning. Every grade-bearing task must identify which CLO-related dimensions are being measured. To avoid double counting, a single artifact can support several CLOs, but the same marks should not be entered repeatedly into the same attainment calculation without an explicit weighting rule.

The final individual assessment should include transfer tasks rather than merely repeat the classroom case. For example, a student could receive a new order with different transport and payment constraints and be asked to locate an inconsistency, identify plausible alternatives or explain the effect of a changed deadline. This creates a second opportunity to observe the intended performance in a fresh context. It also helps test whether a high team score reflects genuine understanding or reliance on another team member's work.

The proposed course grade combines process assessment (60%) with a final individual comprehensive examination (40%). Within process assessment, individual process mapping and case analysis account for 15% of the grade, individual fulfilment verification for 20%, a team integrated proposal for 15%, and individual oral defence and reflection for 10%. These figures are illustrative and must be aligned with local course regulations before use; they are not measured results.

Table 3

Illustrative grade composition

Assessment component	Weight	Primary outcome relationship	Evidence level
Individual process and case tasks	15%	CLO1 primarily; supports CLO4 through explanation	Individual
Individual fulfilment operation tasks	20%	CLO2 primarily	Individual
Team integrated proposal	15%	CLO1–CLO3 integration	Team product; not used alone for individual attainment
Individual oral defence and reflection	10%	CLO4 and cross-check of CLO1–CLO3 understanding	Individual
Final individual comprehensive assessment	40%	Outcome-aligned items for CLO1–CLO3 and selected CLO4 evidence	Individual

Course grades and outcome-attainment values are distinct analytical products. Team scores may form part of the overall course grade but do not, by themselves, establish CLO attainment by any particular student. The outcome scheme therefore uses individual assignments, individual answer sections, oral defence and source checks. A mapping of outcome-specific evidence is presented in Table 4.

Table 4

Individually attributable evidence weights by outcome

Outcome	Evidence and within-outcome weight	Primary interpretation
CLO1	Individual process task: 50%; final aligned section: 50%	Process linkage, key-node identification, explanation of relationships and constraints
CLO2	Individual fulfilment task: 60%; final aligned section: 40%	Operational correctness, consistency checking, error diagnosis, consequence explanation
CLO3	Individual calculation and solution justification: 50%; final aligned section: 50%	Alternative comparison, assumptions, calculation reliability, risk response, justification
CLO4	Individual oral defence: 60%; individual reflection and source verification: 40%	Evidence-based expression, response to questions, traceability, integrity and responsibility

Let s(i,k,j) denote student i's percentage score for evidence component j under outcome k, and let w(k,j) be its prespecified within-outcome weight (summing to 1). The attainment index is $A(i,k) = \Sigma_j w(k,j) \times s(i,k,j)$. The class mean for outcome k is the average of A(i,k) over students with valid assessments. The attainment rate is the proportion for whom A(i,k) meets the prespecified threshold $\tau(k)$. Both class means and attainment rates should be reported along with valid sample sizes, dispersions and missing-data rules; no attainment values are calculated in this design-only paper.

4.4. Four-level analytic rubric and quality safeguards

Instructors must specify the boundaries between the four performance bands before use. At threshold level, a student might produce a workable process sequence yet miss secondary relationships, or compare two options with adequate arithmetic but limited sensitivity analysis. A proficient student should show the major cross-functional implications and justify a recommendation under identified risks. Exemplary work should additionally anticipate plausible changes in assumptions and trace supporting sources. Below-threshold work would contain material omissions or unreliable calculations that make the decision unpersuasive. The purpose of such anchors is to facilitate reproducible judgments, not to assert that one rubric works equally well in every cohort.

Missing and late evidence also require an announced rule. A genuine non-submission, an excused

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absence and a missing record due to a platform failure are not interchangeable. For each CLO, the course report should list the denominator used in the attainment rate, the number of excluded or remediated cases and the reason for each exclusion category. If a student completes a permitted make-up assessment, its alignment and comparability with the original task should be checked before the replacement score enters the outcome calculation. These simple procedures matter because the apparent proportion of learners meeting a threshold can change substantially through inconsistent denominator choices.

The analytic rubric distinguishes exemplary, proficient, threshold and below-threshold performance on four dimensions. It can be applied to separate individual artifacts as well as to the relevant criteria of integrated projects. Table 5 gives criterion anchors; detailed scoring points should be specified for each task before students submit work.

Table 5

Example four-level performance descriptors

Dimension	Exemplary	Proficient	Threshold	Below threshold
Business-process analysis	Represents all critical nodes and relationships; explains constraints and downstream effects accurately.	Represents major nodes and relationships with minor omissions; explanations are generally accurate.	Represents the basic process but connections or constraints are only partly explained.	Important nodes are missing or disconnected; explanations show major conceptual errors.
Fulfilment verification	Checks relevant information systematically; locates inconsistencies and explains operational consequences.	Identifies most important inconsistencies and applies rules with only minor errors.	Performs basic checks but misses some inconsistencies or provides weak consequence analysis.	Verification is incomplete or unreliable; major inconsistencies are not recognized.
Solution decision making	Compares credible alternatives using explicit assumptions, reliable calculations, time/risk analysis, and a well-supported recommendation.	Compares alternatives with generally reliable calculations and addresses major risks; recommendation is supported.	Provides a feasible comparison but assumptions, sensitivity, or risk analysis are limited.	Provides little meaningful comparison; calculations or assumptions are unreliable and recommendation is unsupported.

Communication and responsibility	Uses traceable evidence, responds clearly to challenge, identifies uncertainty, and demonstrates responsibility for fulfilment consequences.	Explains decisions clearly and uses identifiable evidence; responds adequately to most questions.	Can describe the main decision but evidence use or responses are incomplete.	Cannot explain key decisions or sources; responses indicate weak ownership or responsibility judgment.

Before formal grading, instructors should jointly score representative anonymized examples, discuss differences in interpreting each anchor, and revise ambiguous wording. A sample of submissions should receive a second independent score. Disagreements and any scoring adjustments should be documented; the proportion double-scored and an appropriate agreement statistic can then be reported. Questionnaires and learner satisfaction may explain the learning experience but should not be substituted for these direct artifacts.

4.5. Continuous-improvement protocol

After each teaching cycle, instructors should inspect CLO-level summaries, distributions, threshold attainment and examples of common errors. Each weak result is classified as a possible conceptual misunderstanding, procedural error, decision-criteria omission, insufficient evidence, or assessment-design problem. The corresponding response must specify a concrete instructional change, when it will be introduced, and which comparable task will be used to judge it in the next cycle.

Table 6

Evidence-to-action improvement decisions

Observed evidence pattern	Diagnostic question	Instructional response	Reassessment evidence
Repeated CLO2 document-consistency errors	Rule misunderstanding vs. missing checking routine	Add worked error cases and an individual verification checklist practice	Comparable verification task using different documents
CLO3 solutions compare price but ignore time and risk	Incomplete decision criteria	Require time-risk parameters, sensitivity prompts, and a structured risk register	New scenario with changed lead time or disruption risk
Strong team product but weak individual defence	Team score masking individual understanding	Increase independent calculation/verification artifacts and targeted oral defence	Compare team score with individual evidence in next cycle
Large scorer disagreement on rubric levels	Unclear criteria or calibration problem	Revise descriptors, use anchor examples, and conduct joint trial scoring	Repeat double-scoring on a new sample

Students can perform tasks but cannot trace data sources	Weak evidence-use norms	Require source annotations and explicit distinction between simulated and external data	Audit traceability in later project submissions

Because the first implementation has not been observed in this study, this protocol is a prospective improvement design rather than a completed quality-improvement loop. Evidence of improvement would require implementation over at least one subsequent comparable cycle with stable CLO definitions and appropriately comparable tasks.

5. Discussion

An important implication concerns the distinction between assessment for grading and assessment for improvement. A course can legitimately give some weight to a collaborative proposal while calculating outcome attainment using the individual components that most directly reflect the target skill. This is not a rejection of teamwork; it is an attribution rule. In practice, teachers should retain the team product and the individual artifact trail together so that a difference between them can prompt productive feedback. Discrepancies may also reveal weaknesses in group organization or task assignment, which deserve attention even when they are not themselves CLO scores.

The proposed design can be adapted to classes with different preparation levels without changing its core logic. Entry-level learners may receive partially completed process maps and structured checking prompts, while more advanced learners can face altered lead times, disruption scenarios and conflicting business objectives. Nevertheless, the definitions of the four outcomes and the rubric criteria should remain sufficiently stable to support comparison across consecutive cohorts. Future research should report how much scaffolding was supplied so that apparently higher attainment is not misread as better competence when assistance levels differ.

The design addresses three tensions in interdisciplinary business education. First, complete order-fulfilment tasks are needed to keep financial, logistical and contractual decisions connected, while separate rubric dimensions are needed to avoid a non-interpretable overall score. Second, teamwork reflects business practice yet may conceal who understands particular decisions; individual calculations and questioning reduce this ambiguity. Third, a course's numerical attainment index offers a summary but is insufficient for deciding what the teacher should change; artifact-level error interpretation must accompany aggregate values.

The framework extends outcome-based practice by connecting the abstract idea of alignment to specific evidence sources for trade and supply chain decisions. It also treats assessment as a resource for continuing learning rather than simply certification, consistent with learning-oriented assessment [20]. Its contribution is an implementation-ready and testable logic for connecting outcomes, authentic tasks, scoring and corrective action; no causal claim about educational effectiveness is warranted at

this stage.

Several limitations matter. The rubric has not been empirically calibrated; the example weights have not been optimized; and the case's realism has not been evaluated by students or industry experts. Teacher workload, class size and the reliability of oral questioning could affect feasibility. A future study should identify cohort size and prior attainment, document task versions and valid cases, report rubric agreement and CLO scores, and compare equivalent tasks across cycles without inferring causal impacts from a single class or uncontrolled pre/post difference.

6. Conclusion

This paper specifies an OBE-based course redesign for International Supply Chain and Trade. It identifies four observable outcomes, integrates them through a staged cross-border order task, separates team activity from individual performance evidence, and connects outcome-level attainment to rubric-based diagnosis and instructional revision. The design contributes a transparent assessment architecture for an interdisciplinary economics and management course. Its impact on learning remains to be determined through ethical, documented implementation and repeated assessment with comparable tasks.

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Author contributions

Conceptualization, Ruihui Yu; methodology, Ruihui Yu; formal analysis, Ruihui Yu; writing—original draft preparation, Ruihui Yu; writing—review and editing, Ruihui Yu; funding acquisition, Ruihui Yu. All authors have read and agreed to the published version of the manuscript.

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Data availability

No new data were created or analyzed in this study. Data sharing is not applicable to this article.

Declarations

Conflict of interest

The author declares that there is no conflict of interest.

Ethics approval

Ethical approval was not required for this study.

Consent to participate

Not applicable.

Consent for publication

Not applicable.

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