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Exploration on the Construction of an Experimental Curriculum Group Based on Dual Deconstruction and Matching of Teaching Content and Software Functions

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Abstract: Due to the mismatch between the experimental content of new business courses and the functions of purchased teaching software, problems such as low software utilization rate, low degree of cross-course software sharing, and serious waste of teaching resources have arisen. Therefore, based on Bloom's Taxonomy of Educational Objectives and Competency-Based Education theory, this paper proposes a dual deconstruction method of experimental teaching content and software functions, and constructs a ternary interactive matching experimental curriculum construction model with "experimental teaching objectives, students' competency evaluation, and software function support" as the core. The feasibility of this model is verified by the practice of constructing the experimental curriculum group in the School of Business and Tourism Management of Yunnan University, which provides a feasible model and path for solving the mismatch between the experimental teaching content of new business courses and software functions.

Keywords: Software function deconstruction; Teaching content deconstruction; Ternary interactive matching model; Curriculum group construction

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1. Introduction

Current business education often emphasizes theoretical knowledge acquisition at the expense of cultivating the comprehensive abilities and qualities needed to solve complex real-world business problems, resulting in an imbalance between theory and practice [1,2]. Many economics and management programs still rely heavily on lecture-based teaching, with limited experimental or practical training components. This leads to weak practical operational skills among students, hindering their ability to apply knowledge and ultimately impairing teaching quality [3,4]. Experimental software, by simulating realistic business environments, offers students

repeatable hands-on opportunities and has become a vital support for new business education. However, a "disconnection between software functions and teaching content" often arises due to the complexity and rapid advancement of software capabilities relative to the slower evolution of teaching materials. This misalignment results in low software usage, difficulties in cross-course sharing, and underutilization of equipment resources. Existing research tends to focus on adapting specific software to individual courses, with little systematic theoretical or practical exploration of cross-course software function sharing. How to break down disciplinary barriers and establish a scientific integration model to enable efficient sharing of experimental software across courses has become a central issue in the reform of new business experimental teaching [5]. This paper presents the experience of constructing an experimental curriculum group at the School of Business and Tourism Management of Yunnan University (hereinafter referred to as "the School"). It conducts a dual deconstruction of experimental teaching content across nine majors and the functions of digital and intelligent experimental platforms, builds an adaptive matching model, and explores implementation pathways for cross-course software function sharing. The study aims to provide practical insights for addressing the above issues and enhancing the overall effectiveness of new business experimental teaching.

2. Deconstruction methods for experimental teaching content and software functions

The deconstruction of experimental teaching content is guided by Bloom's Taxonomy, categorizing teaching objectives into four levels: application, analysis, evaluation, and creation [6]. Each level is associated with explicit core questions and operational methods: the application level emphasizes problem-solving in new contexts; analysis involves breaking down complex issues into components; evaluation requires judgment based on criteria; and creation focuses on designing novel solutions. This hierarchical framework facilitates the progression of students' cognitive abilities from lower-order to higher-order thinking.

Software function deconstruction follows three principles: appropriate granularity, Outcome-Based Education (OBE), and high cohesion with low coupling. The aim is to transform complex commercial software into teachable modules. Two core methods are employed: first, overall function identification, which panoramically analyzes the software's core positioning and functional architecture; second, process- and task-based deconstruction, which breaks down overall functions into sub-modules. Teaching flowcharts or experimental task records are used to clarify the correspondence between software functions and instructional steps.

Based on dual deconstruction, teaching objectives are translated into observable and measurable student competency indicators. Grounded in Competency-Based Education theory, precise terminology and hierarchical evaluation criteria are applied to define abilities [7]. Teaching activities and assessment methods are then designed around these competencies, forming a training system that spans ability definition to evaluation feedback.

3. Matching model for experimental teaching content and software

Based on alignment theory and dual deconstruction elements, a ternary interactive matching model of teaching and software is constructed, with experimental teaching objectives as the "starting point," students' competency evaluation as the "measure," and software function support as the "carrier" (see **Figure 1**). This model emphasizes the dynamic balance and coordination among experimental teaching objectives, students'

competency evaluation, and software function support. Mismatch between any party and the others will lead to unsatisfactory teaching effects [8].

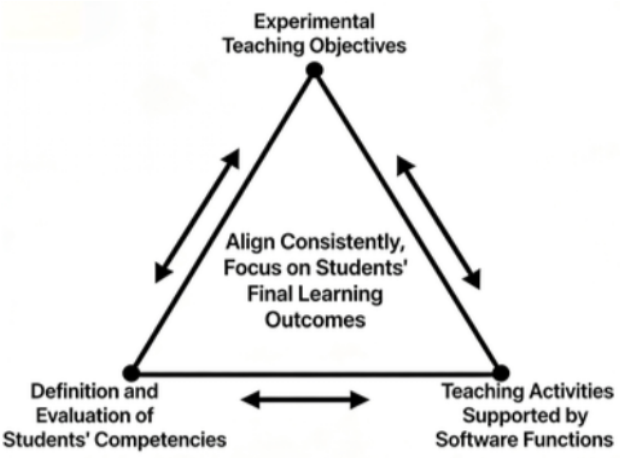

Figure 1. Ternary interactive matching model of experimental teaching content and software functions

The practical operation of this model involves refined mapping of classified experimental teaching objectives, specific students' competency evaluation tasks, and deconstructed software function modules to complete experimental design, including three processes: objective decomposition and mapping, evaluation task design, and teaching activity planning and function matching [9]. This model provides teachers with a systematic operation method, enabling them to accurately use software functions matching teaching from the perspective of teaching objectives, realizing the transformation of experimental teaching from simple software operation training to the real acquisition of students' abilities.

4. Deconstruction of teaching content in the School's experimental curriculum group

According to the School's talent development program, nine majors offer 197 experimental and practical training courses, forming a comprehensive experimental teaching system. Using the ternary interactive matching model, core course experiments from six majors are deconstructed along four dimensions: experimental objectives, content, core ability training, and student competency evaluation **Table 1**.

Table 1. Deconstruction of experimental teaching content of new business majors

Major	Course name	Experimental objectives	Experimental content	Core ability training	Students' competency evaluation
Financial Management	Financial Big Data Mining	Guide the construction of financial big data mining and prediction models with advanced algorithms, realizing the closed-loop management from data to intelligent decision-making	Master core data analysis methods; conduct financial report outlier mining, learn text mining technology, and complete strategic analysis practical exercises	Data modeling and prediction ability, indicator model construction, and visual early warning ability, strategic insight ability	Evaluate model application and intelligent decision-making literacy based on the completeness and effectiveness of data mining models and the feasibility of text mining strategic analysis reports

Table 1 (Continued)

Major	Course name	Experimental objectives	Experimental content	Core ability training	Students' competency evaluation
Business Administration	Enterprise Operation Simulation	Construct a simulated business environment, promote the integration of theoretical knowledge, and cultivate operational management capabilities and innovation and entrepreneurship literacy	Form an entrepreneurial team and divide responsibilities, carry out simulated enterprise operation decisions, and complete business review and strategic adjustment	Systematic knowledge integration and application ability, entrepreneurial practice and problem-solving ability, team collaboration and leadership ability	Comprehensive evaluation based on the financial performance of the simulated enterprise, the completeness of the operation analysis report, team collaboration efficiency, and adaptability performance
Accounting	Comprehensive Auditing Simulation Training	Master intelligent auditing processes and methods, cultivate risk identification and evaluation capabilities, and strengthen professional ethics awareness	Simulate the complete auditing process, use tools to conduct data analysis, perform internal control tests, prepare working papers, and generate audit reports	Auditing practice operation ability, professional risk judgment ability, data analysis technology application ability, and professional ethics adherence ability	Evaluate auditing procedure execution ability and professional literacy through the standardization of auditing work and the accuracy of the final report
Tourism Management	Tourism Big Data Analysis and Application	Cultivate practical statistical analysis capabilities of industry cases, and master the application skills of data science methods in market prediction and resource optimization	Conduct passenger flow analysis and prediction, tourist sentiment analysis, and complete the construction of tourism demand prediction and real-time monitoring and early warning systems	Multi-source data fusion and analysis ability, industry practical problem-solving ability, interdisciplinary integration and innovative thinking	Evaluate students' ability to transform data into industry insights through data analysis reports, the design and interpretation of visual dashboards, and decision-making suggestions
Human Resource Management	Digital and Intelligent Human Resource Management Training	Improve students' digital and intelligent tool operation capabilities and innovative thinking, cultivate practical problem-solving abilities, and adapt to future workplace needs	Form a team to formulate strategies, carry out periodic human resource decisions and confrontations, and complete data analysis and review report writing	Strategic human resource management ability, data-driven decision-making ability, market insight and change management ability	Evaluate strategic human capital management ability based on the value ranking of simulated enterprises and the interpretation of HR input-output benefits
Logistics Management	Intelligent Logistics and Supply Chain	Cultivate the ability to optimize logistics systems using AI technology, and promote intelligent decision-making and sustainable development of supply chains	Carry out supply chain network optimization, formulate inventory management strategies, and complete warehousing and distribution optimization and risk collaborative response	System modeling and optimization ability, trade-off decision-making and scientific literacy, overall perspective and collaborative thinking	Evaluate system planning and optimization decision-making ability by combining supply chain simulation indicators, scheme innovation, and the effectiveness of risk solutions

5. Deconstruction of functions of the School's digital and intelligent experimental platforms

To align with the laboratory construction initiatives outlined in the "14th Five-Year Plan," the School has introduced the DBE Big Data Platform, the ARE Platform, and the Supply Chain Network Optimization Platform. These platforms are designed to support the experimental teaching required for achieving future talent development objectives. As integrated, digitalintelligent platforms for business practice teaching, they offer comprehensive functionality beyond that of single-purpose tools, featuring a high degree of integration and modular design.

5.1. Functional deconstruction of the DBE big data platform

(1) Data integration and governance function: The DBE Platform has strong multi-source data access and preprocessing capabilities. It can simulate and integrate enterprise financial data, business data, etc., to form a financial-business integrated database. Meanwhile, the platform supports importing data in various formats, such as text and CSV, from external sources, and can perform data cleaning, transformation, and standardization to provide a guarantee for subsequent analysis.

(2) Data analysis and mining function: The platform embeds multi-level analysis tools, mainly focusing on three functions: descriptive and inferential statistical analysis (the graphical interface provided by the platform enables quick completion of data exploration, hypothesis testing, correlation and regression analysis, etc.); data mining and machine learning (the platform integrates mainstream data mining algorithms, including classification analysis, clustering analysis, text analysis, etc., supporting students in model training, parameter adjustment, optimization, and evaluation to mine patterns from data and build relevant models); text mining and natural language processing (the platform provides text mining tools such as word frequency statistics, sentiment analysis, and semantic network analysis, and supports the analysis of unstructured data such as user reviews and public opinion).

(3) Visualization and interactive analysis function: The visualization components and interactive analysis interface provided by the DBE Platform can transform analysis results into more intuitive presentations, including multi-dimensional dynamic charts and interactive dashboards. Multi-dimensional dynamic charts support the generation of various statistical charts and advanced visualization charts; interactive dashboards allow users to combine different charts by dragging and dropping to monitor key performance indicators in real time.

(4) Business process simulation and model construction function: The DBE Platform does not merely conduct simple data analysis, but provides a low-code or guided business modeling and simulation environment. Among them, scenario-based analysis templates provide built-in analysis models and guided analysis paths for common business scenarios to help students learn better; process simulation and decision optimization can simulate complete business processes and embed optimization algorithms, allowing students to adjust desired parameters for simulation and intuitively observe the impact of different decisions on business results.

5.2. Functional deconstruction of the ARE platform

(1) Teaching management: The ARE Platform supports simultaneous course sessions for multiple classes, enabling flexible course maintenance, student check-in, and task management. It provides complete teaching resource packages, including instructor manuals, student guides, equipment operation manuals, and case-based accounting sets. The assessment module is staged, allowing learning outcomes

to be reinforced through tests, reports, meeting reviews, and other formats.

(2) Virtual enterprise operation: The platform aims to replicate end-to-end enterprise operations, simulating the full cycle of "human, financial, material, production, supply, and sales" processes. It covers core business activities such as sales order processing, production planning, procurement, warehousing and logistics, and financial settlement. The platform also supports simulation of key scenarios like productionsales coordination and collaborative procurement, strengthening understanding of cross-departmental collaboration.

(3) Post-based training: Roles such as General Manager, Sales Supervisor, Procurement Supervisor, Production Supervisor, Warehouse Supervisor, and Finance Supervisor are defined with clear responsibilities. Students can assess their performance through post-operation reports. The platform also enables queries of post-related regulations, business forms, and data, along with document filling and process simulation, to achieve training objectives.

(4) Data analysis and summary: A suite of reporting functions—including balance sheets, income statements, and fundoccupancy details—allows students to perform statistical analysis on operational data. The platform's scoring system provides a comprehensive evaluation of training effectiveness and generates overall performance scores.

5.3. Functional deconstruction of the supply chain network optimization platform

(1) Model creation and management: Users can quickly create supply chain models as an analytical foundation. The intuitive interface allows customization of model names and initial settings. After creation, students can perform basic configurations, such as modifying scenario names and unit settings, to ensure the model reflects actual business requirements.

(2) Data import and integration: The platform supports flexible data import, including singletable and batch uploads of preprocessed data. Data covers essential information such as warehouses, customers, and transportation rules to ensure completeness.

(3) Scenario analysis and multidimensional simulation: A core function is multi-scenario analysis. Students can define rules via "scenario items" to create different scenarios. Key to this is comparing baseline and optimized scenarios to analyze cost variations. During operation, parameters can be adjusted to simulate different network states.

(4) Network optimization and rule adjustment: The platform enables dynamic supplychain network optimization. Users can modify rules to re-plan product flows. Through optimization, the system automatically calculates cost savings and helps students identify the optimal network structure.

6. Construction of the School's experimental course cluster under the matching model

The ternary interactive matching model emphasizes ability cultivation as the goal, integrating course teaching objectives, student competency evaluation, and software functions into a dynamically balanced curriculum construction approach. This facilitates efficient cross-course sharing of software capabilities. Below are practical examples of aligning the School's experimental courses with the three major software platforms, demonstrating the feasibility of the matching model.

(1) Financial big data mining training: This course focuses on building financial bigdata mining and prediction models, following a "datamodeldecision" teaching logic. DBE's data integration and

governance functions support processing multisource data, such as financial statements and user reviews. Its dataanalysis and mining algorithms align with experimental content like outlier detection and text analysis. The businessprocess simulation function helps students complete predictionmodel construction and optimization. Evaluation centers on the completeness and effectiveness of datamining models and the feasibility of textmining strategy reports, achieving precise alignment between teaching objectives and platform functions.

(2) Enterprise operation simulation: Designed to integrate multidisciplinary theory and cultivate comprehensive operational decisionmaking ability, this course uses the ARE Platform, whose modules cover marketing, finance, production, and other functions. Students engage in realistic business games within a competitive environment. Through the "decisioncalculationfeedback" cycle, the platform helps students apply theoretical knowledge, exercising problemsolving and teamwork skills. Evaluation is based on corporate financial performance, report completeness, and team collaboration efficiency, realizing harmony between ability training and software support.

(3) Comprehensive auditing simulation training: This course aims to develop intelligent audit processes and methods, risk identification and assessment capabilities, and professional ethics. Software support adopts an "ARE + DBE" collaborative mode: ARE provides business data and process context through virtual enterprise operation, supports practical task execution via postbased training, and consolidates knowledge through phased assessments. DBE assists in anomaly identification and risk evaluation through data analysis and mining, and enhances workingpaper preparation and reporting through visualization. Data from both platforms—such as operation logs, process records, and analysis results—are crossverified, achieving tight alignment between teaching objectives and software functions.

(4) Tourism big data analysis and application: Grounded in Yunnan's natural and cultural tourism resources, this course cultivates "theory + practice" composite talents, with the core objective of improving students' ability to solve realworld tourism industry problems using big data. DBE's four core modules enable functional adaptation: data integration and governance merge multisource tourism information and perform preprocessing; visualization components generate heat maps, sentiment distribution maps, etc., for intuitive presentation; scenariobased templates provide industryaligned guided pathways, helping students rapidly integrate bigdata theory with core knowledge such as tourist consumer behavior and destination management. Student work is evaluated based on dataanalysis report quality, visualdashboard design, and feasibility of decision recommendations, reducing subjectivity and ensuring close alignment with course objectives.

(5) Digitalintelligent human resource management training: This course enhances students' ability to operate digitalintelligent tools and apply innovative thinking, using the dualplatform "ARE + DBE" model. ARE builds realistic operating scenarios through virtual enterprise functions, strengthens practical HRmodule operations via postbased training, and drives the decision cycle and summary through task management and review functions. DBE processes multisource HR data via its analysis and mining functions, simulates decision parameters through businessprocess simulation, and aids reviewreport writing through visualization, supporting decisionbenefit analysis and result presentation. Evaluation focuses on simulated enterprise value ranking and interpretation of HR inputoutput benefits, assessing students' strategic humancapital management capabilities, and reflecting their skills in strategy formulation and datadriven decisionmaking.

(6) Intelligent logistics and supply chain: This course aims to promote intelligent decisionmaking and

sustainable supplychain development. It primarily uses the Supply Chain Network Optimization Platform for modeling and DBE for data analysis. The Supply Chain Platform builds practical models through creation and management functions, ensures data integrity via import and integration, compares network states through scenario analysis and multidimensional simulation, and dynamically optimizes the network through rule adjustment. DBE processes multisource logistics data via integration and governance, and transforms optimization results into intuitive charts through visualization. Evaluation relies on scenariocomparison data from the Supply Chain Platform, costoptimization reports, and DBE visualization outputs, comprehensively reflecting students' capabilities in model construction, scenario analysis, and optimization decisionmaking.

7. Conclusion

In response to common challenges in experimental teaching for emerging business disciplines—such as misalignment between teaching content and software functions, low utilization of software, and difficulties in sharing resources across courses—this paper proposes a construction model for experimental course clusters based on the dual deconstruction and matching of teaching content and software functions. By incorporating educational taxonomy and competency-based education theory, the experimental content and software functions are deconstructed, and a tripartite interactive matching model centered on "experimental teaching objectives, student competency assessment, and software function support" is established. This provides a theoretical foundation and practical framework for the systematic design of experimental teaching and the targeted application of software functions. Taking the Business and Tourism College of Yunnan University as a case study, this paper examines the functional deconstruction and matching practices across six core professional experimental courses and three digital intelligence experimental platforms, verifying the feasibility and effectiveness of the model in promoting cross-course software sharing and enhancing experimental teaching efficiency. Practice demonstrates that the model helps instructors scientifically select and integrate software functions according to teaching objectives, thereby shifting experimental teaching from simple software operation training toward in-depth competency cultivation. This approach effectively improves students' data-informed thinking, decision-making abilities, and innovative competence. The model not only offers an actionable methodological pathway for reforming business experimental teaching but also provides a reference for building experimental course clusters and integrating teaching software resources in other disciplines. In the future, the application of this model can be extended to different course types and technical platforms to further deepen the integration and innovation of experimental teaching and digital technologies.

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