

Research on Curriculum System Reconstruction of Intelligent Office Ability Cultivation from the Perspective of Industry-Education Integration

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Abstract: The explosive application of generative AI technology has driven profound transformations in corporate office operations toward intelligentization, collaboration, and data-driven approaches. Currently, foundational computer science courses in higher education institutions have failed to keep pace with this industrial revolution in terms of goal setting, content delivery, and teaching methodologies, resulting in structural mismatches between talent supply and industry demands. Grounded in industry-education integration perspectives and incorporating collaborative theory with competency-based education principles, this study analyzes the conceptual characteristics and evolutionary logic of intelligent office capabilities, while examining practical challenges in existing curricula such as goal misalignment, outdated content, and contextual gaps. The research proposes adopting outcome-based education (OBE) principles to reconstruct curriculum objectives, deconstructing typical work tasks to modularize instructional content, and implementing industry-academia collaborative pathways alongside diversified value-added evaluation mechanisms to achieve alignment between educational systems and industrial needs.

Keywords: Industry-education integration; Intelligent office capabilities; Curriculum system restructuring; Digital transformation

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1. Introduction

With the rapid development of the digital economy, generative AI technologies represented by large-scale models are reshaping social production methods and office work patterns at an unprecedented pace. From traditional standalone document processing to cloud-based collaborative smart offices, and now to human-machine collaborative creative workflows, enterprises 'demands for office capabilities have undergone fundamental transformations. The revised *Vocational Education Law* of the People's Republic of China and national policy documents on modern vocational education system reform explicitly emphasize the importance of integrating industry with education and strengthening school-enterprise partnerships, while promoting organic alignment between educational talent chains and industrial innovation chains. This not only constitutes strategic policy design but also represents the essential path to addressing current talent supply-demand imbalances ^[1].

However, computer fundamentals courses, serving as the core vehicle for cultivating college students' information literacy and workplace skills, have exhibited significant teaching reform delays. The widening gap between curriculum content and technological advancements, coupled with persistent barriers between classroom environments and real-world professional settings, continues to result in prevalent issues such as students achieving high scores but lacking practical skills, and learning content that doesn't align with job requirements. This disconnect not only wastes educational resources but also undermines students' core competitiveness in the job market. From the perspective of industry-education integration, how to precisely meet industrial demands for intelligent office capabilities while restructuring curriculum frameworks and implementation pathways has become a critical challenge in higher education reform. This paper explores institutional root causes of existing problems through an analysis of evolving competency requirements, proposing systematic strategies for curriculum restructuring^[2].

2. Logical starting point of intelligent office capabilities

Precise positioning of competency objectives serves as the prerequisite for curriculum system restructuring. Under the backdrop of digital transformation, the connotation of office capabilities has undergone a qualitative leap, no longer confined to instrumental rationality at the operational level but expanding toward value rationality at the application level, exhibiting distinct contemporary characteristics.

2.1. Transition from tool operation to human-machine collaboration

Traditional office capabilities primarily focus on menu operations in Office softwares, document formatting, and basic data processing, with evaluation criteria emphasizing operational proficiency and accuracy. This competency model is built on the unidirectional logic of "human operating software," exhibiting distinct mechanical characteristics. In the era of intelligent office solutions, the integration of technologies like generative AI and RPA (Robotic Process Automation) has fundamentally transformed workflow processes. The focus of competencies is gradually shifting toward "human-machine collaboration," requiring professionals to adopt prompt engineering thinking and be capable of directing AI assistants to complete tasks such as content generation, code writing, and data cleansing^[3].

This paradigm shift demands that curriculum objectives transcend mere software operation skill development, focusing instead on cultivating interdisciplinary competencies that encompass intelligent tool mastery, data sensitivity cultivation, and process optimization thinking. Specifically, students should not only learn to create spreadsheets but also define data structures for automated processing; they must not only master document drafting techniques but also utilize AI tools to facilitate creative generation, followed by refinement and quality control. Office capabilities are transitioning from "skill proficiency-oriented" to "intelligent decision-making-oriented," requiring educators to strengthen the deep integration of technical logic and business logic in curriculum design.

2.2. Demand response under industrial digital transformation

The employment demands in industrial sectors serve as a litmus test for educational effectiveness. Text analysis of relevant positions on major recruitment platforms reveals significant shifts in corporate role descriptions for administrative, operational, and managerial positions. Beyond traditional document processing skills, keywords like "data-driven business operations," "cross-platform collaboration," and "digital process management" have emerged as high-frequency terms. The industry requires professionals to transcend technical complexities and leverage office tools to address real-world business challenges.

In the marketing sector, companies no longer settle for employees creating basic pivot tables but require them to utilize business intelligence (BI) tools for visual analysis of sales data to support decision-making. In management contexts, organizations urgently need staff to leverage online collaborative documents for cross-departmental communication and knowledge accumulation. This transformation in competency frameworks demands that educational systems break free

from single-software teaching constraints, establishing a dual-driven training model integrating “technology + business.” Such an approach emphasizes broad technical application scenarios and deep business integration, ensuring talent development aligns with industrial upgrading trends ^[4].

3. Structural review of the current curriculum system

Despite repeated calls for curriculum reform by education authorities, entrenched mindsets and institutional barriers have left foundational computer courses in universities plagued by systemic flaws in their architecture, making it difficult to effectively implement smart office capabilities (Table 1).

Table 1. Comparison of structural mismatch between the current curriculum system and industry demand

Mismatch dimension	Current Status of Curriculum System School Education-Past Tense	Structural contradiction	Real demand in the industrial sector Enterprise requirements-Present/Future tense
Target orientation alienation	<ul style="list-style-type: none"> • Copy the syllabus directly from the exam syllabus • Excessive focus on test pass rates for objective questions • Neglecting business logic and application scenario cultivation • Static and delayed evaluation criteria • The teaching materials still rely on outdated versions like Office 2010. 	Target misalignment Starting Point Deviation capacity collapse	<ul style="list-style-type: none"> • Dynamic and cutting-edge workplace demands • Position Competency Orientation • Business logic comprehension ability • Ability to solve practical problems
Content updates are delayed	<ul style="list-style-type: none"> • Lacks WPS Advanced Apps and cloud office platform • Does not involve low-code development tools or generative AI tools • Rarely involved in creating a “technological generation gap” 	Supply fault Content is outdated Interest erosion Ability impairment	<ul style="list-style-type: none"> • Smart Office with Cloud Collaboration • RPA (Robotic Process Automation) • Business Intelligence (BI) analysis tool • AIGC Generative AI Tools • Low-code development platform
Lack of teaching context	<ul style="list-style-type: none"> • The Mainstream Teaching Model of “Demonstration-Imitation” • Separating Business Background from Social Attributes • Use virtual, unrelated data for presentation • Lack of immersion in authentic business environments • Students ‘understand technology but lack digital transformation skills 	Contextual deficit Migration obstruction logical fracture The chasm is too great to cross	<ul style="list-style-type: none"> • Real enterprise office scenarios • Business Background and Social Attributes • Real Data and Business Cases • Cross-department collaboration • Understanding Management Intentions and Business Logic

3.1. Verification-oriented approach obscures application logic

For years, computer fundamentals courses have been reduced to mere preparatory courses for certification exams. Curriculum designs often directly replicate exam syllabi, with teaching objectives overly focused on passing rates. This utilitarian approach has led to the neglect of cultivating students’ business logic and practical application skills. While students can memorize complex mathematical formulas fluently, they struggle to develop sound computational models when dealing with real-world corporate financial statements or administrative data ^[5].

The deeper issue lies in how this goal alienation leads to “competency collapse.” While standardized grading systems often remain static and outdated, the real demands of the workplace are dynamic and cutting-edge. When educational objectives are fixated on exam pass rates as the ultimate goal, teaching begins to deviate from its original purpose of serving industry needs. Students learn merely to obtain certifications rather than to develop job competencies, creating an

insurmountable gap between curriculum instruction and workplace requirements. This results in severe misallocation of educational resources.

3.2. Supply gap triggered by technological iteration

The development cycle for textbook content often lags behind technological iterations, a phenomenon particularly pronounced in the fast-evolving IT industry. Currently, many university textbooks still focus on basic operations of outdated software like Office 2010, while rarely addressing advanced WPS applications, cloud-based office platforms, low-code development tools, or emerging generative AI technologies. This curriculum gap in keeping pace with cutting-edge innovations has created a noticeable “technological generation gap” in educational materials.

In an era where AI technology can automatically generate presentations, courses that still require extensive time spent teaching manual animation settings and word-for-word document editing have clearly lost their relevance. This outdated content and supply-demand gap not only erodes students’ learning motivation but also directly undermines their ability to adapt to future workplaces. School education has become a relic of past knowledge transmission, while corporate demands require real-time skill application that remains in the present or even future tense. The urgent need to bridge this disconnect is critical.

3.3. Decontextualized teaching disrupts transfer pathways

The “demonstration-imitation” approach remains the predominant teaching model today. In multimedia classrooms, instructors demonstrate software operation procedures while students mechanically replicate these practices in labs. This context-free teaching method strips away the professional context and social dimensions inherent in office tasks, reducing dynamic workplace scenarios to repetitive operational instructions. Due to insufficient immersion in authentic corporate environments, students struggle to comprehend the managerial intentions and business logic underlying specific operations.

Taking email merge function instruction as an example, teachers often use hypothetical and unrelated data for demonstrations. While students may learn the operational steps, they struggle to grasp the practical value of this feature in real-world scenarios such as bulk correspondence distribution or business ID card production^[6]. The absence of such contextual applications makes it difficult for students to transfer acquired knowledge to actual workplace environments, resulting in an awkward situation where they “master technical skills but lack understanding of digital transformation.” This severely hinders the sustainable development of students’ professional competencies.

4. Reconstruction principles from the perspective of industry-education integration

To address these challenges, the restructuring of the curriculum system should not be limited to piecemeal adjustments, but rather a systematic overhaul grounded in the logic of industry-education integration, requiring clear logical frameworks and theoretical foundations.

4.1. Guidance mechanism based on OBE philosophy

The Outcome-Based Education (OBE) philosophy emphasizes “starting with the end in mind,” which involves deriving graduation requirements from industry demands for smart office professionals, then working backward to establish curriculum objectives and teaching content. This approach breaks free from traditional disciplinary knowledge frameworks, creating a closed-loop mechanism where “demands define goals, goals determine content, and content supports goals.”

During the curriculum restructuring process, universities must conduct in-depth industry research to identify typical job responsibilities within occupational clusters and transform them into learning domains. This approach goes beyond merely compiling corporate case studies; it requires deconstructing and redefining professional competencies to ensure every course and instructional module delivers clearly defined learning outcomes. The core principle of reverse design

logic lies in maintaining dynamic adaptability of the curriculum system, ensuring talent development consistently aligns with industry demands through precise alignment.

4.2. Hierarchical structure based on competency orientation

Intelligent office capabilities exhibit distinct hierarchical and composite characteristics. Guided by career development principles and Competency-Based Education (CBE) theory, the curriculum framework should adopt a progressive, tiered structure. The foundational level focuses on tool application to address “know-how” challenges, establishing students’ information literacy foundation and ensuring universal digital literacy competencies. The application level emphasizes scenario integration to tackle “practicality” issues, cultivating technical problem-solving skills in specific business contexts while integrating technology with professional expertise. The innovation level prioritizes intelligent empowerment to resolve “strength” challenges, guiding students to optimize workflows through cutting-edge technologies while fostering innovative thinking and digital leadership capabilities ^[7].

This modular deconstruction framework not only ensures the universality of general education to accommodate diverse academic needs, but also highlights the advanced nature of vocational education, thereby establishing a solid foundation for students’ sustainable career development.

5. Specific strategies for curriculum system restructuring

The implementation of logical frameworks requires support from concrete execution pathways. Universities should adhere to a systems-oriented approach to drive substantive transformation of the curriculum system from “macro-level design” to “micro-level implementation”.

5.1. Building an advanced supply system

Breaking away from traditional “manual-style” chapter structures, we have developed a three-tier progressive curriculum framework based on career development patterns and cognitive logic, integrating “general education foundations + professional integration + advanced innovation”. First, we solidify the general education platform (accounting for 40% of total class hours) by retaining essential content such as document formatting standards and data processing fundamentals, while significantly reducing menu operation tutorials. A new “Smart Office Ethics and Competence” module has been introduced, focusing on explaining generative AI principles, prompt engineering logic, and data security awareness to cultivate students’ “automated thinking” at foundational levels. Second, the professional integration module (40% of total hours) tailors teaching content according to competency maps of different academic disciplines. For economics and management programs, we emphasize “Advanced Excel Financial Modeling + Power BI Business Intelligence Analysis” to enhance operational analysis and predictive decision-making skills. Secretarial management programs prioritize “Automated Official Document Writing + Collaborative Office Platform Configuration” with RPA tool applications. Art and design programs concentrate on “AI-Driven Creative Design + Intelligent Multimedia Material Processing” to bridge technological and artistic gaps. Finally, the advanced innovation practice tier (20% of total hours) introduces a “Low-Code Development & Process Reengineering” micro-specialty, guiding students to build practical solutions for office challenges and transform from “tool users” to “tool innovators” (Table 2).

Table 2. Three-stage progressive intelligent office course system architecture

Course Level	Course hour ratio	Train objective	Typical teaching content	Applicable specialty
General Education Foundation Platform (Shared at the bottom layer)	40%	Strengthen the foundation of information literacy Establish “Automated Thinking” Addressing the ‘can or cannot’ question	<ul style="list-style-type: none"> • Document formatting and AI-assisted generation • Ethics and Literacy of Smart Office <ul style="list-style-type: none"> • Data security awareness 	All majors across the university (obligatory)
Professional Integration Template (Medial separation)	40%	Deep integration of technology and expertise Scenario-based application capabilities Addressing the ‘feasibility’ issue	Business Administration: Advanced Financial Modeling in Excel + Business Intelligence Analysis with Power BI Secretarial Management: Automated Official Document Writing + Collaborative Office Platform Configuration Art and Design: AIGC-assisted Design + Intelligent Processing of Multimedia Materials	Business and Economics Secretarial Management Art and Design (Optional)
Expand innovation tiers (Advanced Level)	20%	Intelligent Process Reengineering Innovation Capability and Digital Leadership Addressing the issue of ‘strength versus weakness’	<ul style="list-style-type: none"> • Low-code Development and Process Reengineering Micromajor • Platform application requirement analysis for DingTalk Integration and JianDao Cloud → Form design → Process configuration → Deployment • Design of Pain Point Solutions for Office Work 	Students seeking opportunities for innovation and entrepreneurship (take as an elective course)

5.2. Implementation of scenario-based teaching innovation

Leveraging industry-academia integration bases and virtual simulation technologies, we have established a “high-fidelity” workplace environment to achieve seamless alignment between teaching processes and real-world workflows. First, we implement project-based learning (PBL) through comprehensive application, moving beyond simplistic “demonstration-imitation” models. By adopting the CDIO engineering education framework, we design integrated teaching projects spanning the entire lifecycle. For instance, the “Quarterly Corporate Marketing Campaign Review Report” project requires students to complete end-to-end tasks from data collection and analysis to dashboard visualization and presentation defense, transforming technical skills into practical problem-solving tools. Second, we develop virtual simulation training platforms utilizing digital twin technology to create virtual environments like “Smart Administrative Service Centers” and “Digital Financial Shared Services Centers.” These systems automatically dispatch tasks such as customer complaint resolution and expense reimbursement reviews while generating real-time operational path analysis reports. This immersive experience effectively addresses common challenges in internships and training programs, such as “difficulty in immersion, visibility issues, and operational constraints”, significantly reducing the adaptation period from academic settings to professional environments.

5.3. Improving diversified value-added mechanisms

We will reform the single evaluation model of “one exam determining lifelong success” by establishing a comprehensive, multi-dimensional value-added assessment system. Regarding evaluation mechanisms, a dual-mentor collaborative assessment framework will be implemented. Final evaluations will incorporate real-world anonymized corporate case studies, with in-house instructors focusing on technical metrics such as document formatting standards and logical rigor

of functions, while industry mentors will assess business comprehension depth, solution feasibility, and professional competence through presentations or project reviews. The weight of industry mentor evaluations is recommended to increase to 40% of the total score. For evaluation indicators, a “value-added assessment” model will be adopted, utilizing online learning platforms to collect comprehensive learning behavior data and generate dynamic learning capability curves. This approach emphasizes not only final product quality but also the progression of students’ skills from “zero foundation” to “proficient mastery.” Additionally, non-standardized achievements such as competition awards, vocational skill certification attainment, and internship performance will be integrated into the evaluation system. Through a credit transfer mechanism, academic credentials and vocational training will achieve mutual recognition.

5.4. Joint development of digital teaching resources

The rapid iteration of educational content demands dynamic update capabilities in teaching resources. Universities should collaborate with industry leaders to establish a “dynamically evolving” intelligent office teaching resource repository. On one hand, developing modular “leaflet-style” workbooks breaks the limitations of traditional paper materials. By adopting loose-leaf binding formats, outdated modules can be flexibly replaced with technological advancements, ensuring teaching content remains perpetually current. Complementary QR code micro-lecture resources enable ubiquitous learning. On the other hand, building shared case libraries and material repositories with enterprises allows regular provision of anonymized real-world business data, exemplary office templates, and typical troubleshooting cases. These resources, after pedagogical adaptation, transform into teaching materials that effectively address issues of “inauthenticity, obsolescence, and emptiness” in academic case studies, providing fresh impetus for curriculum reform.

5.5. Building a “dual-qualified” teaching team

Developing smart office capabilities poses significant challenges to teachers’ technical sensitivity and practical experience. Universities should establish a faculty development mechanism featuring “internal training and external recruitment with two-way mobility.” Implement a corporate rotation system requiring full-time faculty to complete “five-year training cycles,” mandating that computer science instructors accumulate at least six months of industry experience every five years. This includes hands-on placements in corporate executive offices and data centers, where they participate in process reengineering and data migration projects. Upon returning to campus, faculty members must submit practice reports and develop teaching cases derived from real-world projects. Concurrently, the university should launch an industry professor “on-campus workshop” program, inviting corporate CIOs and senior data analysts to serve as industry professors. Establishing “master studios” will enable these experts to collaborate in revising talent development plans and mentoring young faculty members. Through mentorship programs, engineering practice skills among junior teachers will be enhanced, ultimately cultivating a dual-skilled faculty team proficient in both educational principles and intelligent technologies.

6. Conclusion

In an era where digital transformation and artificial intelligence technologies are reshaping workplace ecosystems, reforming foundational computer science curricula in higher education has become a critical imperative for talent development quality. From the perspective of industry-education integration, curriculum restructuring aims to break down institutional barriers, bridge the industry-academia divide, and establish an open, dynamic, and efficient learning ecosystem through goal-oriented redesign, content reorganization, and innovative pedagogical approaches. Future research and practice should focus on the disruptive impact of generative AI on office workflows, dynamically adjust curriculum iteration mechanisms, deepen collaborative development with enterprises, and cultivate more high-caliber intelligent office professionals to drive regional socioeconomic advancement.

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