Application-Oriented Undergraduate Professional Course Reform Based on OBE in the Digital Context

—A Case Study of 'Logistics Information Management'

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Abstract: In the context of digitization, the reform of the 'Logistics Information Management' course based on the outcome-based education (OBE) philosophy holds significant importance in applied undergraduate professional education. This reform aims to cultivate students' practical and applied abilities, through the clarification of learning objectives, establishment of core competencies and key tasks, design of teaching activities and assessment methods, integration of digital tools and technologies, and continuous improvement and updates. The focus of teaching is placed on developing students' core competencies, enabling them to adapt to the impact of digital transformation on logistics information management. The curriculum design emphasizes the cultivation of practical operations and application abilities, enhancing students' problem-solving and practical operational skills. This course reform places the learning outcomes and practical abilities of students at the forefront, laying a solid foundation for their future career development.

1. Introduction

The characteristics of applied undergraduate education lie in cultivating students' practical abilities, professional ethics, and innovation skills, with the aim of providing valuable talents for students' career development and societal needs. The teaching content and methods align with the requirements of relevant professional fields, emphasizing the integration of theoretical knowledge and practical skills, with a focus on real-world applications and hands-on practice. This educational model seeks to develop professionals who meet the demands of the job market, emphasizing the cultivation of interdisciplinary knowledge and comprehensive abilities. Through diverse teaching methods such as lectures, practical exercises, case analyses, group discussions, and project presentations, students enhance their practical operational skills, teamwork capabilities, and innovative thinking. The assessment methods prioritize evaluating students' practical operational skills, teamwork abilities, and innovative thinking. Learning activities like project research and course design encourage students to propose novel perspectives and solutions. Through the practical teaching of applied undergraduate education, students can cultivate independent thinking and innovation skills, enhancing their professional ethics, practical skills, and competitiveness in the job market.

To ensure teaching effectiveness, aside from defining clear educational objectives and making practical efforts, enhancing student engagement is crucial and can be achieved through various means. Firstly, students can apply the knowledge gained to real problem-solving scenarios through practical activities such as projects, internships, and hands-on training. This allows students to practice in authentic professional environments, deepening their understanding of professional

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requirements. Secondly, participating in project-based learning and teamwork helps students develop problem-solving, cooperation, and communication skills, fostering a sense of teamwork and collaborative abilities. Additionally, analyzing and discussing real-life cases enables students to think critically about solutions, cultivating independent thinking and problem-solving skills. Moreover, student visits to companies or industries and interactions with industry professionals provide insights into professional demands and industry trends, broadening perspectives and enhancing awareness of career development. Through these methods, students actively engage in practical activities, apply acquired knowledge to real-world problems, develop practical skills, and improve collaboration and communication abilities, thereby gaining practical experience and enhancing their competitiveness in the job market. Furthermore, experiences from practical projects empower students to cultivate self-directed learning, self-development, and adaptability to changes in the professional environment. Therefore, strengthening student engagement is crucial for enhancing teaching effectiveness.

2. Problems Existed in the Applied Undergraduate Education

There are some common issues and challenges faced by applied undergraduate education.

2.1. Gaps between Theory and Practice

The instructional content tends to be overly theoretical, lacking sufficient support from real-life cases and practical exercises, making it challenging for students to apply the acquired knowledge to practical problems.

2.2. Insufficient of the Quality and Capabilities of Teachers

Some teachers lack practical experience and a background synchronized with industry developments, impacting the effectiveness of teaching. Additionally, the lack of opportunities for industry collaboration and practical experiences hinders the close connection between schools and enterprises, and prevents students from truly experiencing real working environments and projects. Furthermore, a uniform assessment approach is also a problem, which leads to prioritizes exam results or singular project reports overly, and fails to comprehensively evaluate students' practical operational skills and overall abilities. Moreover, there are difficulties in updating teaching content and technology exist, and instructional materials lag industry advancements, which fails to meet the needs for cultivating students' capabilities to address emerging technologies and industry requirements.

2.3. Employment Pressure Faced by Students

Students may pursue popular majors at the expense of their interests and career directions, potentially resulting in a mismatch between their employment capabilities and career development. To address these issues, it is essential to enhance student engagement, provide practical components and internship opportunities, and cultivate problem-solving, collaboration, and communication skills. Simultaneously, it is crucial to strengthen teachers' professional development and industry connections, promote industry-academic collaboration, diversify assessment methods, update teaching content and materials promptly, and offer career planning and support are crucial.

3. Digitization Applications

3.1. Digitization of Educational Reform

In the context of digitization, to meet the demands of education and talent development, digital education reform can cultivate individuals with comprehensive abilities and innovative thinking through inquiry-based teaching and the application of educational technologies. This provides reliable talent support for national development, industry transformation, and corporate innovation. To address the issues in applied undergraduate education mentioned above, comprehensive measures can be taken.

(1) Strengthen teacher training and professional development, focus on enhancing teachers' professional growth and proficiency in the application of educational technologies, thereby improving teachers' practical skills and industry background.

(2) Except for establishing close partnerships with industries and businesses to provide more practical and internship opportunities, teachers need to employ more interactive and practical teaching methods. For instance, utilize online learning platforms, virtual laboratories, and simulation software as technological tools for practical exercises and case analyses to enhance students' practical skills and problem-solving abilities.

(3) Adopt diversified assessment methods to evaluate students' practical operational skills, teamwork abilities, and innovative thinking comprehensively, thereby stimulating students' learning motivation.

(4) Update teaching content and materials timely, utilize new technologies, tools, and methods of digital transformation to keep pace with industry developments and technological changes[1]. Revise and adjust traditional teaching content, and provide diverse learning resources and environments.

3.2. Digitization of Logistics Information Management

With the development of digital technologies, the field of logistics is facing both challenges and opportunities in its digital transformation. The logistics information management course plays a crucial role in the digital context of logistics management majors, which is can be presented as follow.

(1) In the digital era, the vast amount of data generated by logistics systems can be utilized for real-time monitoring and optimization of logistical operations. The logistics information management course teaches students how to effectively collect, process, and analyse logistics data. Through studying, students can master data analysis tools and techniques, extracting valuable information from massive datasets to provide a scientific basis for logistics decision-making, such as route optimization, inventory management, and transportation planning.

(2) The logistics information management course instructs students on utilizing digital tools and platforms to achieve collaboration and visualization in logistics processes. Through logistics information systems and internet of things technology, students can gain real-time insights into the status of the supply chain, inventory levels, and transportation progress, enabling traceability and visual management of logistics processes. This contributes to enhancing transparency, coordination, and efficiency in logistics operations, reducing delays and errors in information transmission.

(3) The logistics information management course focuses on the integration of e-commerce and logistics, achieving seamless coordination of order management, warehouse distribution, and customer service through e-commerce platforms. Students gain an understanding of the characteristics and challenges of e-commerce logistics, as well as how to apply knowledge and skills in logistics information management to address issues related to information sharing, tracking, and distribution efficiency in e-commerce logistics.

(4) The logistics information management course also emphasizes data security and risk management, safeguarding the confidentiality, integrity, and availability of logistics data to prevent data leaks, malicious attacks, and information security risks. Through studying, students gain an understanding of data privacy regulations and security standards, and learn emergency measures and management strategies to address data security incidents and risks.

In summary, compared to the problems in traditional logistics information management education, such as a lack of practical aspects, insufficient adaptation to new technologies, and outdated teaching materials, the study of logistics information management in the digital context equips students with key knowledge and skills. These aspects include data analysis and processing, application of digital tools, logistics collaboration and visualization, integration of e-commerce logistics, as well as knowledge in data security and risk management, which prepares students to provide support for logistics management in the digital era.

4. Design of Logistics Information Management Education Reform

When designing the logistics information management course, it is crucial to update teaching content and methods, ensuring that students acquire the knowledge, skills, and tools necessary for logistics information management in the digital context. Additionally, collaboration with the industry and a practice-oriented teaching approach are also essential, as they contribute to integrating theoretical knowledge with practical applications.

4.1. The Framework of the Information Management Education Reform

As shown in Figure 1, the framework of the information management education reform is consisted of the following parts.

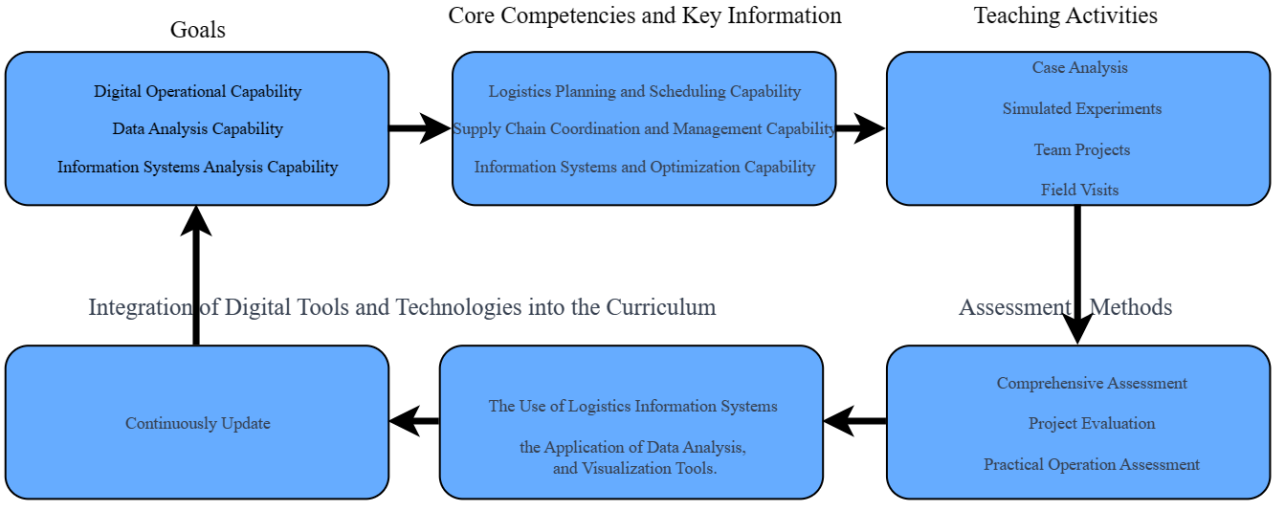

Figure 1 The design of the logistics information management course reform.

Firstly, the paper advocates for curriculum reform in logistics information management based on the outcome-based education (OBE) theory. By employing the OBE, the focus of teaching shift towards the cultivation of students' abilities and practical skills, aligning with the demands of the logistics information management field in the digital era. Additionally, the approach involves determining competency levels and learning paths, integrating real data and cases, encouraging student autonomy and innovation, transforming the role of teachers, fostering collaboration with the industry and a practice-oriented approach. Leveraging technological support and online learning platforms, these measures further enhance teaching effectiveness and student skill development.

Secondly, the paper identifies the core competencies required of students in the field of the logistics information management, including capabilities in logistics planning and scheduling, supply chain coordination and management, and the application and optimization of information systems. Simultaneously, determine key tasks based on industry demands and practical experience, such as optimizing transportation routes, implementing warehouse management systems, and conducting data analysis and reporting.

Second, list the fundamental skills that students must possess to succeed in the field of logistics information management. These skills include the ability to plan and schedule logistics, coordinate and manage the supply chain, and apply and optimize information systems. Determine important tasks at the same time, such as implementing warehouse management systems, conducting data analysis and reporting, and optimizing transportation routes, based on industry demands and real-world experience.

Thirdly, design corresponding teaching activities and assessment methods based on core competencies and key tasks, emphasizing the cultivation of students' practical operational and application abilities. It includes case analysis, simulated experiments, team projects, field visits, etc. Besides, assessment methods should align with learning objectives and core competencies and may involve comprehensive assessments, project evaluations, practical operation assessments, among other approaches.

Finally, integrate digital tools and technologies into the curriculum considering the impact of digital transformation on logistics information management[2]. This includes incorporating the use of logistics information systems, applying data analysis, and visualization tools to cultivate students' capabilities in digital logistics management. Furthermore, the curriculum should emphasize the interdisciplinary integration of logistics management, information technology, and supply chain management. This helps students apply knowledge and skills from different disciplines to solve practical problems[3]. Continuously, the paper improves and update the curriculum based on feedback and assessment results, monitor, and evaluate teaching effectiveness, ensuring alignment with industry needs and student skill development.

4.2. The Implementation of the Information Management Education Reform

Step1: The definition of expected learning outcomes

The expected learning outcomes of the Logistics Information Management course include identifying the knowledge, skills, and attitudes that students should possess to meet the requirements of the logistics field. These outcomes are aligned with industry demands and professional standards.

Step2: The design of specific learning objectives

Learning objectives should be clear, measurable, and can describe students' level of learning. Specific learning objectives should be formulated, such as students' ability to analyse logistics information flows and apply information systems to solve logistics problems. As presented in Table 1.

Table 1 Course objectives.

Course objectives	Assessment criteria
Objective 1	Students' in-class quizzes, classroom questioning, and assignments related to the explanation of logistics information, judgment of logistics information flow processes, and similar topics, are to be completed using platforms such as Chaoxing. An average score of 80 or above is expected
Objective 2	Students are required to use platforms such as Chaoxing to complete in-class quizzes, participate in classroom discussions, and submit assignments related to the explanation of logistics information, assessment of logistics information processes, and similar topics. An average score of 80 points or above is expected for these assignments. Students are expected to complete group assignments and participate in inter-group classroom presentations. The grading for these activities will be conducted using platforms such as Chaoxing, with an average score of 80 points or above required.
Objective 3	Students are required to utilize platforms such as Chaoxing to complete in-class quizzes and participate in classroom discussions, with assignments covering the explanation of logistics information, evaluation of logistics information processes, and related topics. An average score of 80 points or above is expected for these assignments. Students are expected to complete group assignments and participate in inter-group classroom presentations. The assessment for these activities will be conducted using platforms such as Chaoxing, with an average score of 80 points or above required. Students are required to achieve a score of 80 or above for their final report on Logistics Information Systems.

Step3: Alignment of course content with teaching methods

The course content should encompass essential knowledge and skills, such as logistics information systems, data analysis, and supply chain management. Teaching methods should encourage active student engagement, including case studies, practical projects, group discussions, etc., aiming to cultivate students' analytical, problem-solving, and teamwork abilities[4].

Step4: The design of comprehensive assessment methods

Utilize comprehensive assessment methods to evaluate students' learning, which is align with learning objectives, such as project reports, practical operations, case analyses, teamwork, etc. The

assessment should encourage students to integrate their acquired knowledge and skills and showcase their capabilities in the field of logistics information management. Specific assessment aspects include classroom performance and presentations. Classroom performance constitutes 10% of the total grade with rewards ranging from 5 to 10 points based on in-class quizzes and participation. The maximum points awarded should not exceed 25. Classroom presentations contribute to 20% of the total grade, with evaluations conducted through platforms like Chaoxing, and a maximum score of 100 points. Reports account for 70% of the total grade, with scores assigned based on the assessment criteria.

Step5: Continuous improvement and feedback.

Adjust course content and teaching methods promptly based on assessment results and student feedback. Through a feedback mechanism, understand students' learning experiences and challenges and provide guidance for further reforms.

Step6: Industry collaboration and practical opportunities

Establish close collaborative relationships with the logistics industry and businesses, and provide practical opportunities and internships. Through exposure to and collaboration with actual work environments, students gain insights into real occupational demands, acquire practical experience, and enhance their competitiveness in the job market.

In addition, it is recommended to establish competency levels and learning pathways, incorporate real-world data and cases, encourage students in self-directed learning and innovation, facilitate a shift in the role of teachers, foster collaboration with industries and a practice-oriented approach, and leverage technological support and online learning platforms. These measures aim to further enhance teaching effectiveness and student skill development.

5. Conclusion

In the context of the digitization-driven reform of applied undergraduate programs, the reform of the 'Logistics Information Management' course, based on the Outcome-Based Education (OBE) philosophy, focuses on the cultivation of students' capabilities and practical skills to meet the demands of the digitized logistics management profession[5]. By defining learning objectives, establishing core competencies and key tasks, designing teaching activities and assessment methods, integrating digital tools and technologies, and continuously improving and updating, this reform aims to provide targeted education for students, enabling them to acquire the skills and qualities required by the industry. This educational model is designed to better meet the learning needs of students and promote their success in their professional careers.

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