Research on a Knowledge Management-Based Case Teaching System: Postprint

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Abstract

[Purpose/Significance] This study aims to apply knowledge management theory to address the current issues of insufficient relevance and proactivity in case teaching, thereby opening new avenues of thinking for better cultivating new-era talents capable of integrating theory with practice and possessing initiative and creativity. [Method/Process] Employing the analytical methods of literature research and interdisciplinary theoretical integration, this paper first identifies existing problems in current case teaching, then analyzes the feasibility of applying knowledge management theory based on existing literature to conclude that knowledge management and the education field share common ground, and finally proposes strategies for constructing a knowledge management system for case teaching. [Result/Conclusion] The knowledge management system for case teaching consists of two principles and two elements: the principles are relevance and proactivity, while the elements are knowledge management elements and teaching elements. Knowledge management elements include people, knowledge, and technology. The people element exists in the form of knowledge communities, the knowledge element is stored in case repositories, and centered around the principles of relevance and proactivity, the teaching element collaborates with the technology element to serve as a bridge and medium connecting knowledge communities and case repositories, collectively forming a knowledge management circulation system with interactive internalization and externalization of knowledge.

Full Text

Research on Case Teaching System Based on Knowledge Management

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Abstract:
[Purpose/significance] This study aims to apply knowledge management theory to address the problems of insufficient relevance and initiative in current case teaching, thereby opening new avenues for cultivating innovative, applied, and interdisciplinary talents who can integrate theory with practice. [Method/process] Using literature analysis and multidisciplinary theoretical integration methods, we first identify existing problems in case teaching, then analyze the feasibility of applying knowledge management theory through existing literature to demonstrate the compatibility between knowledge management and education, and finally propose strategies for constructing a knowledge management system for case teaching. [Result/conclusion] The knowledge management system for case teaching comprises two principles (relevance and initiative), knowledge management elements, and teaching elements. The knowledge management elements include people, knowledge, and technology. The human element manifests as knowledge communities, while the knowledge element is stored in case repositories. Centered on the principle of initiative, teaching principles and technical elements serve as the axis and intermediary for the mutual transformation between knowledge communities and case repositories, jointly forming a cyclical knowledge management system for interactive knowledge internalization and externalization.

Keywords: knowledge management; case teaching; knowledge spiral; knowledge community

Classification Number: G642; G201

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1 Introduction

Case teaching as a pedagogical method originated at Harvard University in the mid-19th century and flourished in the 20th century. Its emergence and development are closely linked to the social environment and talent demands of its time. In the early 19th century, Western countries faced urgent societal needs for lawyers and institutionalized legal education, prompting American universities to pioneer the modernization of legal professions and personnel mechanisms. Building on Eliot's innovative concepts, Harvard Law School Dean Langdell introduced the "case method," sparking a reform movement in legal education. By the 1920s, due to evolving social and judicial practice demands and the rise of legal realism after World War I, problem-oriented case teaching that cultivates legal reasoning abilities began gaining international attention and promotion, remaining active across various disciplines.

Case teaching is dedicated to case study and helps students improve their ability to connect theory with practice. However, methodological maturity does not necessarily correlate with practical effectiveness. Moreover, given regional and cultural differences, simple mechanical transplantation is certainly not advisable. In current case teaching across many disciplines, this method suffers from

various problems, primarily due to insufficient relevance and initiative. From a relevance perspective, as an organically connected system, case teaching objectively requires that case repository content align with knowledge points and that case repository application corresponds with teaching processes. Subjectively, it demands that teachers and students actively establish connections between various knowledge points within a course and between related courses. Otherwise, students may end up understanding neither the knowledge points nor the case study itself, leading to lost interest in case learning and potentially causing them to blindly pursue standard answers while neglecting the case analysis process. Insufficient relevance is closely linked to insufficient initiative. From an initiative perspective, as a learning attitude rooted in a sense of responsibility and continuous innovation, case teaching requires active mastery of cases, active participation in discussions, and active establishment of knowledge point connections. This is a requirement for both students and teachers.

How can we solve this problem? Through literature analysis, we find that current research on case teaching problems focuses on three aspects: First, by discipline, studies mainly concentrate on the applicability of case methods in specific subjects, with fewer investigations into the commonalities and regularities across the educational field [1]. Second, by research object, studies primarily focus on improving case teaching methods, skills, or teaching model modifications [2]. Third, by research content, studies mostly combine personal educational experience for analysis and exposition, with less theoretical research and interpretation [3]. While scholars have proposed many valuable insights based on their own case teaching and repository construction, these studies also exhibit characteristics of singularity and repetition. Overall, existing research remains limited to patching up traditional cramming teaching models or making partial improvements to online teaching components, failing to break free from the "command-and-control" teaching management model. This prevents case teaching from fully realizing its potential and hinders its development, making it difficult to adapt to contemporary talent cultivation requirements.

Higher education concerns both present and future development. At the 2018 National Education Conference, General Secretary Xi Jinping emphasized that universities should "focus on cultivating innovative, interdisciplinary, and applied talents," placing new-type talent cultivation in a prominent position and pointing out the direction for higher education talent training, which in turn compels synchronous transformation in the education sector. Currently, under the impact of the information wave, social development has accelerated dramatically. Only by actively mastering knowledge and connecting knowledge can individuals possibly utilize and create knowledge. Only by learning to actively learn and create knowledge can we adapt to societal demands for innovative, applied, and interdisciplinary talents amid the vigorous development of artificial intelligence, big data, and networking. Under these goals and requirements, how should case teaching develop? How should it transform to better strengthen the relevance and initiative of case learning, thereby cultivating innovative talents and improving student quality? Can we break through traditional thinking,

analyze and grasp case teaching from a new perspective, and construct it as an organic cyclical teaching interaction system rather than just a teaching method? Perhaps we can gain some beneficial insights from other fields.

We have found that the command-and-control teaching mindset currently prevalent in education resembles corporate management models. This management model, originating from DuPont and General Motors in the 20th century, is also advancing toward knowledge management organizational systems under the urgent demands for continuous innovation driven by information age transformation and rapid technological development. Such organizational systems based on knowledge management theory exhibit typical characteristics of initiative and relevance, offering incomparable advantages over traditional 20th-century organizational models and better adapting to new-era organizational development requirements.

Although current theoretical circles have begun introducing knowledge management into education and teaching, applications remain limited to conventional teaching. Some scholars have used knowledge management theory to analyze educational information and knowledge transmission and teaching models [4], while others have discussed professional development issues for university teachers [5] and the construction of teaching-research organizations [6] from a knowledge management perspective. Existing research rarely extends knowledge management theory to the field of case teaching. So, is knowledge management theory applicable to case teaching? Can it solve the two major problems in case teaching? How can we address these issues? We believe that case teaching needs to embrace the theory and practice of knowledge management, constructing a case teaching system from a knowledge management perspective to solve current problems of insufficient relevance and initiative, thereby opening new pathways for achieving a virtuous cycle in overall education and teaching.

2.1 The Connotation of Knowledge Management Theory

The connotation of knowledge management lacks a unified definition in academia. Drucker, the greatest management guru of our time and the earliest proponent of knowledge management theory, pointed out that a knowledge management system is knowledge-based, composed of various experts who make "autonomous decisions and management" based on obtained information. This system should have an organizational structure with clear and simple common goals and a feedback mechanism for comparing goals and effects [7]. T. H. Davenport advocates that effective knowledge management requires a mix of people and technology [8]. Z. Milan argued as early as the late 1980s that knowledge is a primary capital and that people and knowledge in organizations will play leading roles in the future [9]. K. M. Wiig believes that knowledge management activities need to structure science and technology, organizational frameworks, and cognitive processes, and must combine organizations and networks to acquire, store, and use knowledge [10]. Professor Li Jiahou, from the perspective of social and educational informatization development,

points out that knowledge management studies the laws of human activities in acquiring, disseminating, sharing, utilizing, and innovating knowledge, managing various continuous processes related to knowledge to promote social development [11].

Knowledge management theory possesses characteristics of initiative and relevance. Knowledge management requires that organizational activities center on mobilizing and leveraging human consciousness and initiative. In Garvin's article "Building a Learning Organization" [7]44, he proposes that a knowledge management system stems from cultivated learning attitudes, sense of responsibility, and "well-designed management processes." Among these, learning attitude and sense of responsibility constitute the two key elements of initiative. David A. Garvin distilled systematically solving problems, experimenting with new methods, learning from one's own past practices, learning from others' experiences and best practices, and rapidly and effectively transmitting knowledge within organizations as the five cornerstones of a knowledge management system. We can see that the relevance emphasized by knowledge management includes not only methodological relevance but also relevance of knowledge information content, relevance between subjects, relevance between methods and problems, and even relevance between people, knowledge, and technology. "Autonomous decision-making and management" and "well-designed management processes" centrally embody the core connection between initiative and relevance, which complement each other.

In summary, we can summarize the connotation of knowledge management as an activity that studies the laws of human acquisition, dissemination, sharing, utilization, and innovation of knowledge, comprising three internal elements: people, knowledge, and technology, with characteristics of initiative and relevance.

2.2 Adaptability Analysis of Knowledge Management Theory

As an applied theory in business management, knowledge management has also attracted widespread attention in the education community in recent years. In the internet era, the knowledge economy has become increasingly important, and modern society needs high-quality innovative service talents. Talent cultivation lies in continuously expanding knowledge. Only by creating and flexibly using knowledge can we gain a foothold in the knowledge age. To create, one must possess the ability to flexibly use knowledge; to flexibly use, one must learn to manage knowledge, and only through communication and complementarity between people can its energy be unleashed. As shown in Figure 1 [Figure 1: see original paper], in the knowledge age, education is the primary pathway for cultivating talent and an important component of the knowledge economy. Applying knowledge management theory in the education field is a strategy for responding to social change.

2.2.1 Knowledge Management Theory and Education Share Common Ground

Although the connotation of knowledge management lacks a unified definition in academia, from a social and educational informatization perspective, knowledge management studies the laws of human activities in acquiring, disseminating, sharing, utilizing, and innovating knowledge, managing various continuous processes related to knowledge to promote social development [12]. Knowledge management theory can be introduced into the education field because education is precisely the path linking knowledge management with its core culture. Examining school management at all levels from a knowledge management perspective can yield great insights [13]. At the teacher level, knowledge management facilitates the management of teachers' tacit and explicit knowledge using knowledge management theory, enhancing overall teacher specialization and school organizational competitiveness. At the student level, knowledge management can foster a positive application view oriented toward students, helping them improve knowledge learning efficiency and cultivate innovative qualities needed for the knowledge economy era [14]. At the university level, to adapt to social development needs, institutions must also strengthen knowledge management to optimize knowledge value.

2.2.2 Knowledge Management Theory Helps Respond to Social Change

Knowledge management is a product of the transition from industrialization to the information age. In her book *The Evolution of Knowledge*, Allee uses the metaphor of a pendulum to contrast the Newtonian worldview with the quantum worldview to illustrate the fundamental changes facing contemporary society [15]. This transformation shifts from a Newtonian to a quantum worldview. As shown in Table 1 , the space of curvilinear velocity is closely connected to our practice, and we can no longer remain stuck in the pendulum world of Newton and economist Smith [16].

The information explosion demands knowledge transmission and creation, requiring a rethinking of traditional mindsets, which to some extent impacts teachers' and students' inherent teaching models. To adapt to social change and lifelong learning requirements, a new education system helps teachers and students become subjects who 善用 (skillfully use) information technology.

2.2.3 Knowledge Management Theory Is Applicable to Case Teaching

As an important teaching method in the education field, case teaching aims primarily to improve students' ability to connect theory with practice through teacher-guided case analysis. As shown in Table 2 , the connotation, subjects, and purposes of case teaching align with those of knowledge management. Why include teachers as subjects? From a purely teaching perspective, students are certainly the main subjects of case teaching. However, when incorporating

knowledge management theory analysis, the subjects of the case teaching system include not only students who use and innovate knowledge but also teachers who organize and guide case teaching. Teachers also need to accumulate experience during the case teaching process.

2.2.4 Introducing Knowledge Management Theory Helps Solve Current Case Teaching Problems

The important role of knowledge management is reflected in all aspects of the education field [18]. Current problems of insufficient relevance and initiative in case teaching can be solved by constructing an organic, interactive knowledge management system with applicability and practicality that incorporates organizational elements. In this system, teachers and students, as knowledge creators, achieve the goal of continuous knowledge innovation through processes of acquisition, storage, updating, and sharing, feeding back into the system [19]. This aligns perfectly with the theoretical framework of knowledge management and helps leverage its characteristics of relevance and initiative. In other words, applying knowledge management theory does not merely treat case teaching as a simple methodology but uses case teaching content elements to utilize and update knowledge, which is consistent with the essential requirements and functional purposes of case teaching itself.

Thus, from a knowledge management perspective, we can conceptualize case teaching as a process in which teachers and students acquire, learn, share, and innovate disciplinary knowledge through case materials. Only by doing a good job of knowledge management in each 环节 (link) can we maximize the function and role of knowledge and effectively achieve teaching goals and teacher-student growth. Drawing on the theory and practice of knowledge management to construct an interactive system and solve the long-standing problems in case teaching is imperative.

3 Construction Path of Knowledge Management System for Case Teaching

Constructing a systematic and scientific knowledge management system for case teaching helps solve problems of insufficient initiative and relevance. First, corresponding principles must be established to theoretically strengthen attention to case teaching issues. As Drucker said, establishing a new information-based organizational system first requires a "score" [7]8—that is, principles—to concisely and clearly guide different people to achieve different goals. This organizational system is the information-based organization: the knowledge management system.

3.1 Principles for Constructing Case Teaching System

University case teaching has abundant case materials. How to construct a scientific knowledge repository, enhance the knowledge system of teachers and

students, flexibly use the above modules to increase teaching effectiveness, exchange and share knowledge with others, and complement each other's strengths to address major challenges in the big data and internet era is precisely the key to innovative development in higher education. In knowledge management practice, relevance and initiative are two indispensable principles.

3.1.1 Principle of Relevance Throughout the entire construction system, the connection of knowledge systems, the connection between people, the connection between people and technology, and the relationship between people and knowledge are obviously essential. The most needed relevance is the connection between people. From the perspective of tacit knowledge, teachers and students achieve the externalization of tacit knowledge and internalization of explicit knowledge and the purpose of knowledge creation by constructing different knowledge communities to jointly analyze and solve problems. From the perspective of explicit knowledge, the construction of case repositories should be interconnected, forming vertical and horizontal interactive case repository module designs. Finally, teaching models should also consider the relevance requirements of case teaching to achieve alignment between knowledge and knowledge, and between knowledge and teaching chapters.

3.1.2 Principle of Initiative Knowledge management requires that the focus of management activities center on mobilizing and leveraging human consciousness and initiative. Knowledge innovation means a continuous process. Not only does explicit knowledge require active learning, but tacit knowledge also occupies an important position in cognition. For example, teachers and students each have unique backgrounds and capability orientations, with obvious differences in cognitive emotions, beliefs, experiences, and skills. Mutual communication and exchange promote the internalization and externalization of knowledge, which are key steps in the spiral ascent of knowledge. This principle needs to be intensified by strengthening the sense of responsibility in knowledge communities and through collaborative task completion, reflected in stages throughout the teaching process.

3.2 Three Elements of Knowledge Management: Theoretical System Construction

As a strategic issue aimed at creating value, academia and practice have different views on the architecture of knowledge management systems but basically agree on the three elements of people, knowledge, and information. Drawing on the knowledge management equation proposed by Zhongxin Enterprise Management Consulting Company, KM = (K + L)I, we can intuitively express knowledge management as a synthesis of knowledge (K) and human learning (L) in a network environment (I) [20]. Combined with the reality of case teaching, the knowledge management system for case teaching also manifests as three elements: people, knowledge, and technology. On the teaching technology platform, this can be set up as a knowledge community module and a case repository

module. The human element exists in the form of knowledge communities, while the knowledge element is stored in case repositories.

3.2.1 People: Subjects of Relevance and Initiative A knowledge management system without knowledge communities is like an information island [21]. Knowledge communities composed of people are the living springs of knowledge management [22], with every individual being a knowledge creator. As shown in Figure 2 [Figure 2: see original paper], we must first affirm that both teachers and students are participants in knowledge creation.

(1) Teachers are key figures in teaching. As professional personnel in the education field, teachers have established collective responsibilities for their profession, forming professional practice and ethical standards. Only by 善用 (skillfully using) information tools and emphasizing the interactive transmission mechanism of knowledge management can they maintain continuous learning capabilities and qualities.

(2) Students are the subjects of education. Both students and teachers, as instructors and guides, belong to equal knowledge management subjects [23]. Although teachers are the main operators of knowledge management, there is no leadership-subordinate relationship between them. Instead, they jointly operate knowledge management, with different emphases: students focus on how to learn case knowledge, solidify it, and deepen it, while teachers focus on assisting students' case learning and improving their own educational quality.

(3) Teacher-student knowledge communities. Organizational community teams are very important. The case teaching system provides three community links: among students, among teachers, and shared communities between students and teachers. By building a shared environment and setting overall learning goals, they can actively communicate with each other, continuously discuss problems in case teaching to promote reflection, and enable teachers and students to examine problems from different perspectives, integrating different views to form and create new collective knowledge. Moreover, this system's interactive groups can form a long-term interactive community that can absorb practitioners from the field, helping to improve the practicality and relevance of the case knowledge system and promote the transformation between tacit and explicit knowledge.

3.2.2 Knowledge: Object of Relevance and Initiative The evolution of knowledge is a process from data processing to knowledge management. As shown in Figure 2 [Figure 2: see original paper], explicit knowledge mainly manifests as processed judgment documents, pictures, audio-visual materials, comprehensive backgrounds, and other case materials. For example, judgment documents, which embody judicial wisdom and are organized narratives, still require analysis, processing, and systematic refinement and integration before

they can be stored as knowledge in the case repository module. In constructing case repositories for *Private International Law*, for instance, we can design multi-level structures by vertically categorizing international civil and commercial disputes according to their adjustment objects, and horizontally link single case repositories into a whole according to evolving case scenarios to emphasize the internal identity of knowledge points and external application relevance [24].

However, the "knowledge" category contained in the case repository module is not merely the objective mechanical case knowledge itself. After continuous case teaching interactions, the structured experiences, perceptions, and values of teachers and students during the case repository construction process are also part of the knowledge system and can be called tacit knowledge. In other words, a case teaching system incorporating teacher and student elements has knowledge elements that are essentially disciplinary knowledge and its flexible use and innovation.

3.2.3 Technology: Medium of Relevance and Initiative Technology is the bridge and booster connecting people and knowledge. Although it cannot be the core of knowledge management, it is obviously indispensable in the knowledge economy era. On the one hand, the case knowledge platform requires technical means for construction, which is reflected in the case repository establishment stage, requiring technical acquisition and processing of case materials to complete the module architecture. On the other hand, communication and exchange in a networked society cannot do without technical means. Whether in the establishment or operation stage of case repositories, teachers and students need to rely more on online discussion rooms, platform page interactions, and other methods to complete problem exchanges and knowledge innovation. This element, together with the teaching module in Figure 3 [Figure 3: see original paper], serves as the bridge and intermediary connecting and operating knowledge communities and case repositories, promoting the operation of a knowledge management cycle system with interactive knowledge internalization and externalization.

3.3 Teaching Elements: Construction of Practical System

Scientific planning and steps facilitate the organic integration of the above three elements, enabling them to be presented in teaching processes through certain teaching models under the requirements of initiative and relevance principles, thereby achieving course objectives. Therefore, the knowledge management system for case teaching also includes teaching elements, namely teaching models and teaching processes. This element requires setting up one module on the teaching technology platform, which we call the teaching module. Case teaching conducted through information technology is suitable for a blended teaching model. As shown in Figure 3 [Figure 3: see original paper], we can decompose the meaning of "blended" from "online + offline" into three stages: "pre-class," "during class," and "post-class."

3.3.1 Pre-Class Stage: Stimulating Relevance and Initiative The pre-class stage is the process in which teachers and students transform case materials into a case repository, ultimately generating an online case repository module. It is worth noting that student participation in this stage may be greatly limited by ability, time, and other factors. However, the tasks in this stage are obviously closely related to students' initiative and interest, as well as their enthusiasm for knowledge learning in the next teaching stage, and indirectly concern learning effects and evaluation. Since students are also subjects of knowledge learning, even though other teaching stages can provide them with substantial explicit knowledge, teachers' experience and insights in building case repositories are also important tacit knowledge. Only under specific systematic guidance can tacit knowledge be externalized and disseminated for flexible use. Case repository production is an excellent learning opportunity. Feiman-Nemser also advocates that in curriculum planning, students should have opportunities to practice each teaching step separately, jointly design teaching units, and try to transfer their newly acquired planning skills in the field—"they develop and produce mini-courses throughout the semester" [25]. Including students as participants in this pre-class stage is very important. Teachers can consider students as assistants in case repository production, which not only exercises their practical abilities but also stimulates their interest in further case research.

3.3.2 During-Class Stage: Core of Relevance and Initiative The during-class stage is an important knowledge interaction and relevance 环节 (link). Cognitive expert Roger Schank argues that passive methods rarely acquire more knowledge, while active experiences are more valuable [26]. This stage can be further refined into a systematic approach: "upload cases → community discussion → self-study feedback → offline interaction → respond to questions." Taking the *Private International Law* course as an example, teachers first upload a foreign-related movable property inheritance case before teaching the foreign-related inheritance chapter according to the syllabus, arousing student interest and encouraging them to learn online with questions. Second, teachers guide knowledge communities to conduct discussion activities. Based on "informal group" theory, in knowledge community environments, through layered layout and dual-level spatial discussions, students can be prompted to actively express their views within a small environment (informal group), exercising their interpretive abilities. Third, teachers employ diverse methods for knowledge sharing and learning, allowing students to choose from reports, social practice, flipped classrooms, moot courts, or simulated theaters to feedback their self-study effects. Finally, teachers conduct centralized offline teaching, respond to questions, and complete students' knowledge transformation and sharing. In this teaching process, there are numerous effective methods belonging to individual teachers. It is recommended that teachers enter teacher learning communities to discuss and consider the design of each teaching 环节 (link) and share experiences, which also helps expand and reconstruct teachers' tacit knowledge base.

3.3.3 Post-Class Stage: Incentivizing Relevance and Initiative Effective evaluation methods are essential in the post-class stage. Without effective evaluation, we cannot effectively assess and incentivize the relevance and initiative of students' and teachers' case teaching processes, nor can we correctly analyze potential problems in the knowledge management process, thereby losing the generation 环节 (link) of a new round of explicit and tacit knowledge. As the final 环节 (link) of the teaching model, the evaluation mechanism should, on the one hand, encourage teachers to participate more in student discussions while combining information technology assessment results for comprehensive student evaluation. On the other hand, it should continue to improve teacher evaluation mechanisms from the perspective of encouraging and promoting teacher knowledge sharing and innovation.

4 Conclusion

Different disciplines have specific research purposes and characteristics. Some scholars have pointed out that from the perspective of educational theoretical orientation, case application should adapt to different disciplines' educational purposes and logical laws. Different theoretical orientations lead to different case applications and objectives [27]. However, from the level of case teaching's educational characteristics and purposes, case teaching with different disciplinary imprints has its own normative system adapted to the overall discipline, playing a unified normative role. Therefore, we should not make the arbitrary interpretation that "legal cases cultivate the ability to conduct purely objective analysis without emotion, making them unsuitable for teaching fields that cannot be controlled by procedures and rules" [28], nor should we narrowly understand that "the teaching field, like the business field, is an 'unstructured field' " [29]. It is necessary to draw on the theory and practice of knowledge management, study the development laws of case teaching from a knowledge management perspective, and thereby construct a new interactive and cyclical case teaching system. This opens new pathways for better cultivating new-era talents who can integrate theory with practice and possess initiative and creativity. This is precisely the research purpose of this article.

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Author Contributions:
Wang Yi: Proposed research ideas, searched for materials, wrote, revised, and finalized the paper;
Yuan Guang: Searched for materials, wrote and revised the paper.

Note: Figure translations are in progress. See original paper for figures.