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Research on the Pathways to Enhance the Digital Literacy of University Financial Management Teachers in the Context of Digital Transformation

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Abstract:
This paper studies the digital literacy of university financial management teachers under digital transformation. It first identifies the demands and challenges of teachers' information-based teaching based on relevant policies and the digital trend in the financial field, then clarifies the four core dimensions of their digital literacy and analyzes practical dilemmas (weak technology application, insufficient tech-teaching integration, poor data capabilities, and weak digital ethics). Finally, it proposes improvement strategies from four aspects (technology training, teaching integration, data cultivation, and ethics education) to provide references for education digitalization and the upgrading of finance and economics education.

Keywords:
1.Digital Literacy;2. Finance and Management; 3.University Teachers; 4.Digital Transformation;5 Teacher Training; 6.School-Enterprise Collaboration

1.Introduction

With the rapid development of the internet, students now have more channels to acquire knowledge, and the state has set higher requirements for teachers, mandating that they must possess information-based teaching capabilities. Information-based teaching can expand students' diverse learning methods, promote the integration of educational resources, enrich teaching content, optimize teaching methods, and foster students' personalized development.

2. Research Background and Significance

Driven by innovation and technological evolution, digital transformation is reshaping the future of education. In 2022, the Ministry of Education issued the Education Informatization 2.0 Action Plan, aiming to comprehensively improve the sustainable development mechanism of education informatization and build an advanced education system that integrates networking, digitalization, intelligence, personalization, and life-

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long learning. These policies keenly capture the trends of educational transformation in the digital era, calling on teachers to take responsibility for strengthening students' digital competencies.

From the Education Informatization 2.0 Action Plan to the First-Class Course Construction, enhancing information-based teaching capabilities has highlighted its significance. Against the backdrop of the finance sector rapidly embracing digitalization, cutting-edge technologies such as big data, artificial intelligence, and blockchain are widely applied in core business areas like financial analysis, risk control, and intelligent decision-making, profoundly reshaping the industry landscape. Therefore, for teachers in economics schools, actively promoting the deep integration of information technology and education, as well as fostering innovation in course content and teaching methods, is particularly important.

Moreover, the rapid development of education informatization has created new opportunities for university teachers to enhance their information-based teaching capabilities. The widespread application of emerging educational technologies such as MOOCs, smart teaching platforms, and virtual simulation experiments is continuously expanding the boundaries of teaching, providing teachers with more diverse, flexible, and interactive teaching methods, which also requires teachers to actively engage in these information-based teaching practices.

However, despite significant progress in teachers' information-based teaching capabilities, practical challenges such as superficial technology application, insufficient integration of teaching design and technology, and a lack of sustained motivation for development still await systematic analysis and resolution.

In response, this study will adhere to the professional characteristics of finance and economics disciplines and the talent cultivation goals of the digital era, delving into the practical dilemmas and causes of digital literacy enhancement for finance and economics teachers. Ultimately, we hope to propose a set of strategies with both theoretical depth and practical feasibility, offering recommendations for advancing the implementation of the national education digitalization strategy and promoting the transformation and upgrading of finance and economics education.

3.Defining the Digital Literacy of University Financial Management Teachers

"Teacher competence" refers not only to pedagogical skills but also encompasses the personal traits and professional qualities demonstrated by teachers during instruction. These factors directly or indirectly impact the quality of classroom teaching and the degree to which educational objectives are achieved. With the advancement of educational reform and the deepening of teacher professional development, the understanding of "teacher competence" has continuously expanded and evolved, embracing increasingly rich connotations.

In the current context of educational digitization, teachers' information-based teaching capability has become a key indicator for measuring their professional proficiency. It is not merely a simple combination of traditional teaching abilities and information technology, but rather a deep integration of the two—representing teachers' core competitiveness in effectively conducting instruction within digital environments. Overall, this capability consists of four interrelated and complementary dimensions: basic digital literacy, technical

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application ability, instructional design ability, and teaching reflection and theoretical guidance ability.

First is basic digital literacy, which serves as the "foundation" of information-based teaching. This includes awareness of digital ethics, knowledge of cybersecurity, data-informed thinking, and a fundamental understanding of digital technologies. Teachers must possess sound information literacy to enable the safe, compliant, and responsible use of digital resources—a prerequisite for all technology-mediated instruction.

The second dimension is technical application capacity, which represents the critical ability to “use” technology effectively. Teachers should not only be proficient in common instructional tools such as Rain Classroom, Moso Teach, and smart teaching platforms, but also skillfully integrate multimedia, online resources, and smart devices to seamlessly embed technology throughout the teaching process. More importantly, they must develop a problem-solving orientation and innovative mindset, leveraging technology to facilitate collaborative learning, inquiry-based learning, and self-directed learning among students—thereby making classroom instruction more efficient and engaging.

The third dimension is instructional design capability, which reflects the wisdom of "teaching smartly." Teachers need to scientifically design lesson components based on learning objectives and student characteristics: content progression should be logical and scaffolded; teaching methods should be adaptive and diverse; learning activities should emphasize interaction, such as organizing group discussions and project-based practices, to stimulate students’ interest and initiative. This capability is essential for achieving a genuine shift toward student-centered pedagogy.

Finally, the ability to engage in teaching reflection and apply theoretical guidance? acts as the “deep engine” of technology-enhanced teaching. Teachers must possess solid disciplinary knowledge and effectively translate it into practice. They should also cultivate a habit of continuous reflection—observing, summarizing, and identifying issues in their teaching—to continually refine instructional strategies. By using theory to inform action and action to refine theory, they achieve continuous, cyclical improvement in teaching competence.

These four dimensions are interlinked and together form a complete framework for teachers’ information-based teaching capability in the new era. Only by holistically strengthening these four aspects can teachers truly master the new classroom of the digital age and contribute to a qualitative leap in educational quality.

4.Practical Dilemmas in the Digital Literacy of University Financial Management Teachers

4.1.Weak Digital Technology and Application Abilities

Currently, the penetration of digital technology in financial education remains superficial, exhibiting a characteristic of "tool suspension." The most prominent issue is the shallow application of technology. In classroom teaching, most instructors still rely primarily on PowerPoint presentations as their main teaching method, while demonstrating significant technical adaptation difficulties when it comes to advanced applications

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of data analysis tools like SPSS and Python, or when engaging with digital financial scenarios such as big data scraping and processing, cloud-based financial platform operations, and intelligent tax system practices.

Faced with the reality of financial data being voluminous, rapidly updated, and sourced from diverse channels, teachers commonly exhibit competency gaps in critical areas such as database management, data cleaning and integration, and visualization. Although there is widespread recognition of the importance of data-driven decision-making, significant challenges persist in efficiently acquiring, accurately analyzing, and effectively utilizing data to support teaching content and research conclusions in actual instructional and academic settings.

With the deepening application of data analysis technologies in the financial sector, advanced analytical tools (e.g., Python, Tableau) have gradually become essential means for uncovering financial value. While university financial management faculty generally possess solid theoretical foundations in their discipline, they still show noticeable deficiencies in the practical application of modern information technology tools. Some instructors struggle to proficiently master these tools, revealing a gap between theoretical knowledge and technical execution.

In summary, financial management educators currently face a widespread "theory-first, practice-lagging" competency disconnect. This misalignment between conceptual understanding and technical operation not only restricts the improvement of teaching quality and the depth of academic research but may also compromise the alignment of talent cultivation with industry needs. As a result, students may lack the necessary practical literacy and technical competence when entering intelligent, digitized financial work environments. Therefore, enhancing teachers' information-based teaching capabilities has become an urgent priority for advancing the high-quality development of finance and economics education.

4.2.Insufficient Depth in the Integration of Digital Technology and Teaching

When processing financial datasets, there are evident deficiencies in the data cleaning stage, such as insufficient mastery of techniques for identifying and correcting outliers, which casts doubt on the accuracy of subsequent analytical results. More commonly, the integration of traditional financial management models with professional financial teaching remains superficial in classroom settings, failing to establish clear logical connections between theoretical concepts and practical case data analyzed using modern tools. This resembles crudely stitching together old and new fabrics without achieving seamless integration of knowledge frameworks.

Currently, the application of digital technology in financial education largely remains at the level of tool substitution, with pronounced dependence on basic technologies. PowerPoint continues to dominate as the primary digital tool in most classrooms, while advanced virtual simulation experiments show significantly lower adoption rates. Some courses only utilize online platforms for homework submission, while core instruction persists in traditional lecture formats. This stems from deeply ingrained teaching habits, where many instructors rely on basic tools like Excel for financial analysis and explanation. The transition to new technologies faces multiple barriers: the time-consuming nature of mastering new tools, skepticism about their practical value, and concerns that complex practical operations might encroach on knowledge delivery time or disrupt established teaching schedules.

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This cautious approach—or even implicit avoidance—of emerging technological tools inadvertently hinders the transformation of in-depth data insights into effective teaching resources. Consequently, students miss opportunities to develop the core competencies needed to solve complex financial problems. The fundamental challenge lies in the absence of systematic integration strategies: digital technology has yet to become the DNA of instructional design, remaining merely as superficial ornamentation grafted onto traditional teaching frameworks.

4.3.Room for Improvement in Online Resource Identification and Data Integration and Analysis Abilities

Currently, university financial management faculty still demonstrate deficiencies in digital resource application, with relatively weak capabilities in resource evaluation and integrated analysis, which impacts teaching effectiveness.

At the resource evaluation level, some instructors struggle to distinguish the authority of financial data sources. For instance, they may confuse data from the National Bureau of Statistics with that from commercial platforms, or unknowingly use statistically biased annual reports of listed companies, thereby compromising the scientific validity of teaching cases. This evaluation gap undermines the reliability of selected resources.

Regarding data integration, many faculty face challenges in correlational modeling of multi-source financial data (e.g., cash flow, inventory, liabilities), leaving room for improvement in the systematic nature of teaching cases. When addressing policy changes like VAT reforms, classroom instruction predominantly relies on static data presentation, with limited practice in dynamically associating historical data. This somewhat restricts students' depth of understanding in financial decision-making contexts.

In terms of data analysis, the proportion of faculty proficient in predictive analysis using tools like Python or Power BI remains suboptimal. Most instructional scenarios still employ traditional manual calculation of financial ratios. Typical manifestations include: evaluating corporate performance while overlooking lifecycle differences and overemphasizing industry averages, or generating biased instructional inferences due to data irregularities—such as misuse of accounts receivable turnover ratios potentially distorting students' professional judgment.

The current faculty training system primarily focuses on basic software operation skills, while requiring stronger emphasis on cultivating "data value chain" competencies that combine data cleaning, integration, model construction, and decision support. This lack of systematic thinking development poses challenges for faculty in guiding students to build data-driven decision-making capabilities through teaching practice.

4.4.Digital Ethics Awareness Needs Strengthening

Currently, the digital ethics awareness of university financial management teachers remains fragmented, lacking systematic cognition, and requires targeted guidance and institutional constraints.

Weak data security protection awareness and insufficient compliance operation knowledge are prominent risks. Over half of teachers have not systematically studied the prohibitions on cross-border transmission of

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financial data in the Cybersecurity Law, potentially demonstrating violations such as uploading domestic enterprise financial data to international cloud platforms during teaching, posing legal risks. Only a few teachers can identify potential algorithmic biases or data manipulation tendencies in AI-generated financial analysis reports. In technical operations, there is a general lack of digital ethics modules tailored to financial scenarios, making it imperative to promote regular ethics alerts and compliance assessments to strengthen the ethical defenses of digital transformation in finance and economics education.

5.Strategies to Enhance Teachers' Information-Based Teaching Capabilities

5.1. Strengthen Digital Technology Training to Improve Tool Operation Abilities

To address the data tool application issues of financial management teachers, a three-tier training system is recommended to support teaching needs at different levels:

First, focus on cultivating core tool operation abilities at the basic skill level. Initial training should cover essential software like U8+ and Kingdee Cloud Star, ensuring teachers master system functions. Concurrently, small Python application classes should be offered, emphasizing automated data collection and report generation techniques to replace manual calculation processes.

Second, deepen data integration and analysis capabilities through specialized tool training. PowerBI courses should focus on hands-on financial scenarios, guiding teachers to transform fragmented data into dynamic dashboards to strengthen integration abilities. SQLServer modules should use case studies such as building financial databases for manufacturing enterprises to help teachers master data modeling and teaching case conversion skills.

Third, promote deep integration of technology and classrooms through teaching-integration practices. Organize workshops like "Digital Technology Empowering Financial Classrooms," inviting corporate financial directors and educational experts as dual mentors to address cross-platform integration challenges such as embedding e-invoice data and Wind macro data into tax planning case studies, ensuring technology effectively serves teaching design.

Additionally, supporting capacity certification incentives and mechanisms can be implemented, tracking teachers' digital growth records. Refer to industry digital intelligence standards to establish certifications, publicly display teachers' technology capability development maps each semester, and adopt incentive measures to create sustained motivation for continuous learning.

5.2.Promote Deep Teaching Integration to Build a Digital Course System

To achieve deep integration of financial teaching and digitalization, a new course system should be constructed from three dimensions: content restructuring, resource upgrading, and evaluation innovation, bridging the "last mile" between technology and teaching.

First, restructure course content. Incorporate the entire process of financial data from collection and pro-

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cessing to decision support into course standards, helping students understand decision-making logic in uncertain environments.

Second, upgrade teaching resources. Establish a financial data management center to aggregate real business data like e-invoices and bank statements, creating a parameterized case library. Teachers can flexibly adjust variables like tax rates and costs to generate multi-scenario analysis cases, achieving "one case, multiple applications, and multidimensional exploration" to enhance teaching flexibility.

Third, innovate evaluation methods. Establish digital capability growth portfolios for students for process-based evaluation. For example, tax planning assessments should no longer rely solely on exams but require students to submit visual analysis reports, comprehensively evaluating their data processing and decision-making expression abilities.

Monthly workshops such as "Financial Data Chain-Driven Course Restructuring" can be held, inviting corporate experts and university course designers to collaboratively develop cross-platform integrated cases, ensuring technology applications address teaching pain points and promote continuous course improvement.

5.3. Conduct Specialized Data Ability Training to Strengthen Data Application Capabilities

To construct a closed-loop cultivation system for teachers' information-based teaching capacity, a systematic training system must be established to refine the training framework and enhance the effectiveness of information-based teaching.

First, build a systematic training system for teachers' information-based teaching capacity. Use digital literacy assessments to identify teachers' deficiencies and develop targeted basic courses. Focus on financial data analysis tools like Excel financial modeling and cloud collaboration platform management, strengthening foundational abilities through hands-on exercises such as data cleaning and visual chart creation.

Second, advanced courses should involve joint efforts by educational technology experts and renowned subject experts to conduct "integration workshops," deeply analyzing compatibility strategies between information technology and teaching design. Provide in-depth instruction on the theory and methods of information-based teaching, including the integration of teaching design, methods, strategies, and evaluation with information technology, helping teachers improve both theoretical knowledge and practical skills in information-based instruction.

Third, practical simulation sessions should allow teachers to experience the entire process of information-based teaching, from course design to classroom implementation and teaching reflection, accumulating practical experience to enhance their ability to address real teaching challenges.

Additionally, strengthen the integration and optimal allocation of training resources. Comprehensively analyze existing training resources, integrating high-quality resources from various channels and fields, such as educational technology experts from universities, technical R&D resources from enterprises, and teaching practical resources from outstanding teachers.

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5.4.Integrate Digital Ethics Education to Cultivate Standardized Usage Awareness

To deeply integrate digital ethics education into teacher training systems, efforts must be made on both teaching practice and institutional safeguards to fortify data security defenses.

First, infuse digital ethics into teaching scenarios. Embed "data compliance sandbox" exercises in courses like financial data analysis, simulating representative cases such as corporate tax data fraud or unauthorized access to financial data. This guides students in understanding the non-negotiable requirements of the Cybersecurity Law. Simultaneously refine ethical alert mechanisms in teaching tools, requiring financial software to mandatorily trigger pop-up warnings for sensitive operations involving over 300,000 privacy data entries, thereby heightening teachers' risk awareness regarding data usage.

Second, establish an ethical competency certification system. Implement hands-on assessment certifications like "data desensitization" and "financial data flow auditing," while creating data compliance officer roles at the institutional level. Through two-pronged guidance (positive and corrective), cultivate a professional sense of reverence for "data as responsibility."

By integrating ethics into teaching scenarios and institutionalizing assessment constraints, a multidimensional defense covering digital ethics cognition, skills, and responsibilities can be built, propelling teachers to seamlessly integrate technical application with value-driven leadership in digitalized teaching.

6.Conclusion

The digital transformation of education is profoundly reshaping the fundamental fabric of teaching paradigms, with the iterative enhancement of teachers' digitalliteracy emerging as a critical driver of this transformation. This paper systematically examines the structural gaps in the digital literacy of university financial management teachers through the dual lenses of policy direction and practical challenges,proposing a three-pronged developmental pathway integrating "technology, pedagogy, and ethics." Only by continuously strengthening teachers' capabilities in data-driven decision-making, course redesign, and risk prevention and control can the deep integration of finance and economics education with digital civilization be fully realized. By cultivating a versatile faculty that combines technical expertise with humanistic values, we can precisely align with the educational demands of the information age, amplify the distinct voice of digital education with Chinese characteristics, and contribute robust momentum to cultivating talent for the new era in the pursuit of establishing a leading educational nation.

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