Assessment of Lifelong Learning Needs of Financial System Employees in Wuhan City, Hubei Province

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ABSTRACT

The objectives of this research were (1) clarify the overall characteristics and structural hierarchy of lifelong learning needs among financial system practitioners in Wuhan; (2) identify patterns of differences in lifelong learning needs across different groups; (3) reveal core driving factors of lifelong learning needs and supply-demand mismatch issues; (4) propose optimization strategies for a lifelong learning system tailored to Wuhan's regional financial development.

This study employed a mixed-method research approach combining questionnaire surveys and in-depth interviews, with employees from six financial institutions in Wuhan City as the research subjects. A total of 376 valid questionnaires were collected, and data analysis was conducted using computer software.

The study reveals four key findings: (1) Professionals exhibit dual core characteristics in lifelong learning needs, focusing on "fintech integration and regulatory compliance," with a strong preference for online modular courses; (2) Learning demands show significant variations across institutions, age groups, and job roles—banks prioritize compliance, financing firms emphasize technology and skills, young professionals value digital learning, while seasoned professionals rely on mentorship guidance; (3) Five dimensions—compliance, task requirements, organizational structures, individual needs, and regional policies—collectively drive learning demands, with compliance being the most influential factor; (4) Current learning offerings suffer from three major gaps in content, format, and resources, while regional policy implementation faces prominent "last-mile" challenges. Based on these findings, the study proposes targeted optimization recommendations at three levels—government, institutions, and practitioners—through stratified categorization and

policy implementation, providing empirical support for talent development in Wuhan's efforts to establish itself as a national financial hub.

Keywords: Lifelong learning needs, Wuhan City, Financial practitioners, Needs assessment, Five-dimensional framework

1. Introduction

Against the backdrop of global economic integration, deep penetration of fintech, and accelerated digital transformation across the financial sector, the pace of knowledge and skill renewal in finance has significantly accelerated, with professional expertise now having shorter half-lives. The deep integration of digital technologies—including artificial intelligence, blockchain, big data, and cloud computing—with financial operations, coupled with the rapid emergence of emerging sectors like green finance, innovation-driven finance, and cross-border finance, along with continuous regulatory policy updates, demands that financial professionals maintain job competence and career competitiveness through ongoing learning. Lifelong learning has evolved from an optional choice into a mandatory requirement for career survival and development, serving as a cornerstone for risk management, talent competitiveness enhancement, and high-quality industry advancement in financial institutions.

From an international perspective, lifelong learning has become a core policy consensus for global financial talent development. The United Nations' Sustainable Development Agenda 2030 (SDG4) explicitly states "ensuring inclusive and equitable quality education and promoting lifelong learning for all," establishing lifelong learning as a key objective in global education development. The World Bank (2023) emphasized in its report "Lifelong Learning for Inclusive Financial Development" that lifelong learning serves as a critical foundation for enhancing financial human capital, strengthening financial system resilience, and advancing inclusive finance development. It calls on countries to establish continuous learning systems aligned with financial sector transformations. The Organization for Economic Cooperation and Development (OECD) further introduced a lifelong learning policy framework, advocating for personal learning accounts, paid learning leave, and credit recognition mechanisms to facilitate dynamic skill updates among financial professionals and address dual challenges of technological and regulatory changes.

The People's Bank of China's "Fintech Development Plan (2022-2025)" explicitly proposes to "establish a lifelong learning system for fintech professionals," emphasizing the need to strengthen digital skills training and cutting-edge technology education. Lifelong learning has become a core pillar for high-quality development in

the financial sector (World Bank, 2023; People's Bank of China, 2024). As the only sub-provincial city in central China, a national central city, and a key financial hub under development, Wuhan hosts over 800 financial institutions and employs more than 300,000 professionals, serving as a pivotal hub that "connects eastern and western regions while bridging northern and southern areas" in regional economic development. According to the "Implementation Plan for Building Wuhan into a National Key Financial Center," the city prioritizes specialized fields such as technology-driven finance, green finance, supply chain finance, and cross-border finance, setting higher and more precise standards for financial practitioners' knowledge structure, skill proficiency, innovation capabilities, and compliance literacy.

However, Wuhan's financial system currently faces significant shortcomings in lifelong learning services. Most training programs are experience-based rather than supported by empirical demand research. Resource allocation remains uneven across institutions, with large organizations having well-established systems while small and medium-sized institutions suffer from severe resource shortages. Online learning platforms lack adaptability to meet the fragmented, practical, and scenario-based learning preferences of young professionals. Financial education content tailored to Wuhan's regional characteristics remains insufficient, resulting in a notable disconnect between training offerings and actual industry needs (Zhang Hua, 2022). Industry survey data reveals that only 41% of practitioners demonstrate proficiency in fintech tools, and 38% achieve advanced regulatory policy application capabilities (Wuhan Municipal Financial Regulatory Bureau, 2024).

Against this backdrop, conducting precise assessments of lifelong learning needs among financial sector professionals in Wuhan City, identifying demand structures, demographic disparities, driving factors, and supply-demand mismatches, has become a critical prerequisite for optimizing learning resources, enhancing talent quality, and supporting the development of a regional financial hub.

2. Literature Review and Research Relevance

2.1 Lifelong Learning Theory in Financial Systems and Its Development in the Financial Sector

The concept of lifelong education was systematically proposed by Paul Lengrand in 1965 (Xiao Huixiang et al., 2024) and later deepened by UNESCO, becoming a core orientation for global educational development [5]. The lifelong learning development in China's financial industry has gone through four stages: initial stage, growth stage, transformation stage, and maturity stage. From early official extensive training to certificate-oriented market-oriented development, and then to the "certificate + skills +

practice" transformation driven by fintech, it has entered the maturity stage since 2019, exhibiting characteristics of "digitalization, personalization, and ecosystem development" (IMA Institute of Management Accountants, 2025).

International comparisons reveal that major global financial centers have developed highly consistent lifelong education frameworks. The European Union adopts an adult financial literacy framework coupled with mandatory Continuing Professional Development (CPD) hours (European Commission, 2020). The UK has established a National Skills Dictionary integrated with a continuing education system linked to professional qualifications (London School of Banking and Finance, 2022). Singapore implements the SkillsFuture national lifelong learning system, achieving full digitalization across the entire process from skills assessment to course recommendations and subsidy applications (Singapore SkillsFuture, 2021).

Current research still faces three major gaps: First, insufficient theoretical integration, as financial compliance theory, regional development theory, and lifelong learning theory have not been systematically combined. Second, the framework of influencing factors remains incomplete, lacking the unique "compliance dimension" specific to finance and the localized "regional policy dimension." Third, inadequate segmentation of research subjects, with insufficient comparison of demand differences between banks and financing companies, making it difficult to support precision-oriented service strategies.

2.2 Factors Influencing Lifelong Learning Needs in Financial Systems

Domestic and international scholars have developed a systematic understanding of factors influencing lifelong learning needs. At the individual level, factors such as age, educational background, career planning, and self-efficacy significantly impact learning demands. From an organizational perspective, training policies, learning culture, and incentive mechanisms serve as key drivers (Chen Yue, 2021). Brown (2022) found that employees in learning organizations within financial institutions exhibit over 50% higher learning participation rates. At the task level, job responsibilities, skill gaps, and work pressure directly influence learning needs. Smith (2020) revealed that 78% of banking professionals prioritize "application of fintech tools" as their primary learning requirement.

2.3 Impact of Compliance Management and Regional Policies on Learning Needs

The core of compliance management theory lies in financial institutions mitigating risks through compliance systems and training programs. International studies analyzing post-subprime mortgage crisis cases in the U.S. demonstrate that robust

compliance training systems can reduce compliance risk incidence by over 60% (Smith, 2019). However, inadequate targeted training remains a key factor contributing to regulatory violations in some institutions. Domestic research on banking compliance training reveals that only 32% of Chinese banks design differentiated training content based on position-specific compliance requirements, with most organizations still relying on standardized "one-size-fits-all" compliance courses, resulting in suboptimal training outcomes (Wang Yi, 2021). Friedman (2017) found that regional financial talent policies significantly enhance professional competencies among practitioners. Wang Linxin (2025) noted that Wuhan financial professionals now demonstrate strategic expertise in cutting-edge areas such as valuation of sci-tech innovation enterprises and intellectual property-backed financing.

2.4 Variables and Conceptual Framework

This study established a five-dimensional evaluation framework encompassing "organization-task-individual-compliance-regional policy," as illustrated in the table.

Theoretical Support Systems: Lifelong Education Theory, Human Capital Theory, Financial Compliance Management Theory, Regional Development Theory, Organizational Behavior Theory	Organizational dimensions: training policies, learning atmosphere, incentive mechanisms, and external resources	Learning Requirements: Basic Requirements: Compliance practice. Development Requirements: Promotion and deepening. Strategic Requirements: Sci-tech innovation and green finance.
	Task dimensions: job responsibilities, business changes, task difficulty, performance objectives	
	Individual dimensions: age differences, ability levels, career planning, and learning preferences	
Theoretical Support Systems: Lifelong Education Theory, Human Capital Theory, Financial Compliance Management Theory, Regional Development Theory, Organizational Behavior Theory demand theory	Compliance dimensions: regulatory updates, industry standards, internal systems, and risk warnings	Learning Requirements: Basic Requirements: Compliance practice. Development Requirements: Promotion and deepening. Strategic Requirements: Sci-tech innovation and green finance.
	Regional Policy Dimensions: Wuhan Financial Strategy, Specialized Industry Layout, Regional Policy Support, and Cross-regional Collaboration	

3. Research Methods

Building upon the five-dimensional evaluation framework of "organization-task-individual-compliance-regional policy," this chapter adopts a hybrid research design integrating qualitative and quantitative methods to address specific research questions and objectives. The study follows a structured approach comprising theoretical derivation, questionnaire surveys, in-depth interviews, and case validation. Quantitative analysis enables large-scale validation of demand characteristics and influencing factors, while qualitative research reveals underlying mechanisms driving demand formation. This dual methodology ensures research conclusions possess both general applicability and targeted relevance, providing robust data support for accurately assessing lifelong learning needs within Wuhan's financial system.

3.1 Research Objective

The primary objective of this study is to accurately identify the core learning needs of professionals in Wuhan's financial system, systematically reveal differences in learning needs across various groups (institutions, generations, and positions), comprehensively evaluate the suitability of existing lifelong learning offerings, construct a "five-dimensional" assessment framework, and propose systemic optimization recommendations.

3.2 Population and Sample

This study conducted a survey among on-duty employees from three banking institutions (Hankou Bank, Wuhan Rural Commercial Bank, and China Merchants Bank) and three financing companies (Haitong Hengxin International Financing Co., Ltd., Bangyin Financial Leasing Co., Ltd., and Guoyao Ronghui Financial Leasing Co., Ltd.) in Wuhan, employing a stratified random sampling method. A total of 400 questionnaires were distributed, with 376 valid responses collected, yielding a 94.0% response rate. Additionally, in-depth interviews were conducted with 20 participants, and case analyses were performed for the three institutions.

3.3 Data Collection Techniques

Quantitative data were collected through a questionnaire distribution method primarily conducted online with offline supplementary methods, using the Wenjuanxing platform. Qualitative data were gathered via semi-structured interviews, with each session lasting 40-60 minutes.

3.4 Data Processing and Analysis Techniques

After completing the questionnaire collection, invalid responses were excluded and valid data were organized and entered. Descriptive statistics, reliability and validity

testing, and difference analysis were performed using SPSS 26.0; structural equation modeling was conducted using AMOS 24.0; and grounded theory coding analysis was performed using Nvivo 12.

3.5 Research Tools and Variables Used

This study employed questionnaires as the research tool, with variables divided into two parts: first, research on lifelong learning needs of financial practitioners; second, factors influencing lifelong learning needs (including institution type, age, educational background, job position, years of service, and job level).

3.6 Reliability and Validity Testing

This study employed SPSS software to conduct reliability and validity validation of the questionnaire. Reliability analysis demonstrated that all dimensions exhibited Cronbach's α coefficients exceeding 0.7, with the total scale showing an α coefficient of 0.890. Validity testing revealed a KMO value of 0.873 and a significant Bartlett's test ($p<0.001$), while the cumulative variance explained reached 74.56%. The questionnaire design is validated, and the research findings are suitable for analytical application.

Table 1: Results of scale reliability and validity testing

dimension	Number of items	Cronbach 's α	KMO	Cumulative variance explained (%):
Organizational	4	0.843	0.811	68.32
Task Dimension	3	0.796	0.758	65.47
Individual	4	0.815	0.792	70.15
Compliance	4	0.857	0.835	72.68
Regional Policy	3	0.769	0.721	61.23
Learning Needs	15	0.890	0.873	74.56

4. Research Findings

4.1 Demographic Information

The valid sample size of this survey was 376 cases, with the demographic characteristics distribution as shown in the table below.

The sample structure revealed that young practitioners aged 26-35 constituted the highest proportion (37.8%), with bachelor's degree holders forming the majority (56.4%). Two-thirds of the respondents were grassroots-level employees, which aligns closely with the overall demographic structure of financial professionals in Wuhan City, indicating strong representativeness of the sample.

Table 2: Distribution of demographic characteristics in the sample (N=376)

variable	class	Frequency	percentage
sex	man	178	47.3
	woman	198	52.7
age	25 years of age or younger	68	18.1
	26-35 years old	142	37.8
	36-45 years old	112	29.8
	46 years of age and above	54	14.3
Education	Associate degree or lower	46	12.2
	undergraduate course	212	56.4
	Master	102	27.1
	Doctorate or higher	16	4.3
working life	1 year or less	42	11.2
	2-5 years	124	33
	6-10 years	138	36.7
	11 years or older	72	19.1
occupational planning	Professional Technical	186	49.5
	Managed	142	37.8
	Not yet determined	48	12.7
Organization type	bank	238	63.3
	finance company	138	36.7
Job Type	Risk Control Position	72	19.1
	Marketing Position	98	26.1
	Product Design Position	58	15.4
	Management Position	62	16.5
	General Position	86	22.9
Position Level	Frontline employees	248	66
	Middle-level managers	98	26.1
	Senior management	30	7.9

4.2 Overall Characteristics of Lifelong Learning Needs

4.2.1 Learning Content Preferences

Descriptive statistics revealed significant differences in the demand intensity for five categories of learning content among practitioners in Wuhan's financial system. Ranked by mean value from highest to lowest:

Table 3: Descriptive statistics of learning content preferences (N=376)

sort	Learning content	mean (M)	standard deviation	Preference rate (Percentage of responses selecting 4-5
1	**Fintech category**	**4.32**	**0.67**	**86.3**
2	**Compliance Policy Category**	**4.18**	**0.72**	**81.2**
3	**Business Skills**	**3.96**	**0.81**	**72.8**
4	**Management Skills**	**3.53**	**0.93**	**58.6**
5	**Professional Competencies**	**3.21**	**1.03**	**47.2**

The data indicates that fintech-related skills (M=4.32) and compliance policy knowledge (M=4.18) form the "dual core" of learning demands, with preference rates exceeding 80%. Business skills rank in the second tier, while management capabilities and professional ethics demonstrate relatively weaker demand, which may be attributed to the high proportion of entry-level employees in the sample.

4.2.2 Learning Form Preferences

Among the five learning formats, practitioners exhibit significant differences in preferences.

Table 4: Descriptive statistics of learning preference forms (N=376)

sort	Learning format category	mean (M)	standard deviation (SD)	Preference rate (Percentage of responses selecting 4-5 points)
1	Online fragmented courses	4.41	0.58	91.2
2	Offline practical training	4.12	0.76	79.8
3	Mentorship	3.89	0.89	68.3

sort	Learning format category	mean (M)	standard deviation (SD)	Preference rate (Percentage of responses selecting 4-5 points)
4	Online System Course	3.63	0.93	60.2
5	Case Study	3.48	0.97	55.6

Online modular courses ranked first with a high score of 4.41 and a preference rate of 91.2%, reflecting the strong demand among financial professionals for "immediate learning and application with flexible scheduling" under high-intensity work pressure. Offline practical training (4.12) ranked second, indicating that the integration of theory and practice remains the key pathway for competency transformation.

4.2.3 Learning Time Preference

The multiple-choice survey results indicate that practitioners' learning time allocation exhibits highly fragmented characteristics:

Table 5: Distribution of learning time preferences (multiple-choice, N=376)

sort	Study time period	Select frequency	selectance (%)
1	Fragmented time	294	78.2
2	Weekend	197	52.4
3	Workday noon	156	41.5
4	Weekend daytime	118	31.4
5	Morning on workdays	86	22.9
6	On the weekend evening	52	13.8

78.2% of practitioners chose "fragmented time" for learning, significantly exceeding other time periods. This result corroborates the high selection rate of "online fragmented courses" in learning format preferences, forming a strong correlation characteristic of "time fragmentation-form micro-lectures".

4.2.4 Learning Support Needs

The degree of demand for four types of learning support among practitioners is as follows:

Table 6 :Descriptive statistics of learning support needs (N=376)

sort	Learning Support Type	mean (M)	standard deviation (SD)	Preference rate (Percentage of responses selecting 4-5 points)
1	Learning funding support	4.38	0.62	89.6
2	Work time guarantee	4.29	0.68	86.4
3	Learning outcome certification	3.92	0.83	71.2
4	Recommended high-quality learning resources	3.76	0.91	64.8

Financial support (4.38) and time allocation (4.29) rank as the two most pressing needs for practitioners, highlighting the current inadequacy of financial institutions in providing adequate funding and time resources.

4.3 Analysis of Demand Differences Among Different Groups

Independent samples t-test and one-way ANOVA were employed to examine differences in learning needs among different groups.

4.3.1 Differences Based on Institutional Types

Table 7: Comparison of Learning Needs Differences Between Banks and Financing Companies

Learning Content Dimensions	Banks (n=238)	Financing companies (n=138)	t price	p price
Fintech category	4.21±0.71	4.51±0.58	-4.32	0.000*
Compliance Policy Category	4.32±0.65	3.94±0.78	4.98	0.000*
Business Skills	3.82±0.83	4.21±0.72	-4.67	0.000*
Management Skills	3.58±0.92	3.47±0.97	1.09	0.276
Professional Competencies	3.24±1.01	3.16±1.05	0.73	0.466

*$p<0.001$ Analysis revealed that banking professionals exhibited significantly higher demand for "compliance policy-related" services ($t=4.98$, $p<0.001$).

4.3.2 Age-based intergenerational differences

Table 8: Comparison of learning needs differences across age groups (ANOVA)

Learning content/form	25 years of age or younger (n=68)	26-35 years old (n=142)	36-45 years old (n=112)	46 years of age and above (n=54)	F price	p price	post hoc test
Fintech category	4.48±0.53	4.41±0.61	4.22±0.68	3.98±0.79	6.82	0.000*	1,2>3>4
Management Skills	3.12±0.92	3.42±0.88	3.86±0.81	3.78±0.93	9.33	0.000*	3,4>2>1
Online fragmented courses	4.62±0.48	4.51±0.52	4.28±0.61	4.02±0.72	12.47	0.000*	1,2>3>4
Mentorship	3.54±0.91	3.78±0.86	4.18±0.73	4.21±0.78	10.28	0.000*	3,4>2>1

*p<0.001; Post-hoc test: LSD method. Numbers represent age groups (1=25 years and below, 2=26-35 years, 3=36-45 years, 4=46 years and above)

Significant intergenerational differences were observed. Demand for fintech services decreased with age, with the 25-year-old and younger group (M=4.48) showing significantly higher levels compared to the 46-year-old and older group (M=3.98). Demand for management skills increased with age, peaking in the 36-45 age group (M=3.86). Preference for online modular courses declined with age, with the 25-year-old and younger group (M=4.62) demonstrating strongest preference. Mentorship needs grew with age, as employees over 36 years old showed greater desire for "passing on knowledge and skills."

4.3.3 Differences Based on Job Type Classification

Table 9: Comparison of learning needs differences across different job types (ANOVA)

Learning Content Dimensions	Risk Control Position (n=72)	Marketing Position (n=98)	Product Position (n=58)	Management Position (n=62)	General Position (n=86)	F price	p price
Fintech category	4.41± 0.62	4.38± 0.64	4.52± 0.54	4.18± 0.71	4.12± 0.74	4.23	0.002
Compliance Policy Category	4.58± 0.51	4.02± 0.73	4.28± 0.68	4.32± 0.66	3.84± 0.82	9.87	0.000*
Business Skills	3.88± 0.78	4.42± 0.58	4.18± 0.71	3.62± 0.84	3.54± 0.88	15.34	0.000*
Management Skills	3.42± 0.88	3.52± 0.91	3.48± 0.89	4.28± 0.62	3.18± 0.94	1	

p<0.01，*p<0.001

The analysis revealed that risk control positions exhibited the strongest demand for compliance policies (M=4.58). Product roles showed the highest demand for fintech expertise (M=4.52). Marketing positions demonstrated the greatest need for business skills (M=4.42). Management roles had the most pronounced requirement for managerial competencies (M=4.28).

This finding validates the fundamental principle that 'job roles determine core learning needs,' providing direct evidence for designing tiered and categorized training programs.

4.4 hypothesis test

4.4.1 Fit test for structural equation models

Table 10: Structural Equation Model Fit Index

Fit index	χ^2/df	GFI	AGFI	CFI	NFI	RMSEA
criterion for judgement	<3.00	>0.90	>0.90	>0.90	>0.90	<0.08
Model Results	2.34	0.92	0.91	0.94	0.92	0.05
fitting judgment	ideal	ideal	ideal	ideal	ideal	Reason

All fitted metrics met the ideal criteria, indicating good model-data fit and suitability for hypothesis testing.

4.4.2 Path Analysis and Hypothesis Testing Results

Table 11 Path coefficients of structural equation model and hypothesis testing results

hypothesis	path relationship	Standardized path coefficient (β)	standard error (SE)	critical ratio (CR)	p price	result
H1	Organizational dimension → Learning needs	0.28	0.05	5.62	0.000*	found
H2	Task dimension → Learning needs	0.31	0.05	6.24	0.000*	found
H3	Individual dimension → Learning needs	0.22	0.04	4.89	0.000*	found
H4	Compliance dimension → Learning needs	0.35	0.05	7.12	0.000*	found
H5	Regional Policy Dimension → Learning Needs	0.19	0.04	3.86	0.012*	partial establishment
H6	Five-dimensional interactions exist	-	-	-	-	

*p<0.001， *p<0.05

4.4.2.1 H1: Significant impact of organizational dimension (established)

The organizational dimension had a significant positive impact on learning needs ($\beta=0.28$, $p<0.001$). Among these, "degree of training policy refinement" (factor loading 0.84) and "incentive mechanisms" (factor loading 0.79) exhibited the strongest influence.

4.4.2.2 H2: Significant impact of task dimension (established)

The task dimension showed significant influence on learning needs ($\beta=0.31$, $p<0.001$), ranking second in terms of impact intensity among all dimensions. "Competency gap" (factor loading 0.88) and "job complexity" (factor loading 0.81) were identified as core driving factors.

4.4.2.3 H3: Significant impact of individual dimension (supported)

Individual dimensions exhibited a significant positive correlation with learning needs ($\beta=0.22$, $p<0.01$). "Self-efficacy" (factor loading 0.82) and "clarity of career planning" (factor loading 0.76) demonstrated prominent effects.

4.4.2.4 H4: Significant impact on compliance dimension (established)

The compliance dimension had the strongest impact on learning needs ($\beta=0.35$, $p<0.001$), ranking first among all dimensions. "Regulatory update frequency" (factor loading 0.91) and "job risk level" (factor loading 0.87) were decisive factors.

4.4.2.5 H5: Regional Policy Dimension Section (Established)

The regional policy dimension exhibited a significant positive impact on learning needs ($\beta=0.19$, $p<0.05$), though the effect strength was lower than anticipated. "Policy awareness" (factor loading 0.74) positively moderated learning willingness, whereas "access to policy support" (factor loading 0.52) showed weaker influence.

4.4.2.6 H6: Interaction exists between dimensions (true)

The structural equation model revealed significant interactions among the five dimensions:

Regional policy → Organizational training policy → Learning needs (indirect effect $\beta=0.11$, $p<0.05$): Regional policy indirectly influences individual needs by affecting institutional training resource allocation.

Job type × Compliance risk level → Learning content preferences: High-risk positions (risk control, compliance) experience a surge in compliance learning demands during regulatory-intensive periods.

Age × Learning format preference: Young employees demonstrate significantly higher acceptance of digital learning formats.

4.5 Countermeasures to Promote Lifelong Education for Financial System Professionals in Wuhan City

4.5.1 Targeting Government Agencies and Industry Associations: Establishing a Support System of "Policy Guidance-Platform Support-Resource Integration"

Establish a mandatory CPD system for financial practitioners in Wuhan, drawing on the rules of the EU, the UK, and Hong Kong, China, incorporating compliance, fintech, and green finance learning into professional requirements, specifying minimum hours, and linking it to promotions and regulatory evaluations. Set up a Wuhan version of the "Personal Lifelong Learning Account," benchmarking against Singapore's SkillsFuture, with joint funding from the government, institutions, and individuals to subsidize learning expenses in key Wuhan sectors such as sci-tech finance and green finance, reducing costs for small and medium-sized institutions and young employees. Develop regional financial skill standards and a learning roadmap, referencing the EU's "Adult Financial Competence Framework," with capability standards jointly formulated by the Municipal Financial Bureau and industry associations to create standardized learning pathways. Simplify subsidy application processes by adopting Singapore and Hong Kong's one-stop platforms, enabling one-click applications with instant approval and redemption. Promote collaboration among government, enterprises, schools, and international institutions, introducing international certifications such as CFA and FRM, and co-developing courses with local universities and financial institutions to enhance the internationalization of talent.

4.5.2 Targeting Financial Institutions: Establishing a Training System Based on "Demand Orientation-Stratification and Classification-Hybrid Delivery"

Establish a regularized demand assessment mechanism and implement tiered, targeted training programs: For frontline staff, focus on compliance practices and online micro-courses (aligned with U.S. banking standards); for middle management, emphasize team leadership and case studies (inspired by UK and Singapore models); for senior executives, prioritize strategic decision-making and ESG frameworks (benchmarking international financial centers). Develop a blended learning model combining online modular content with offline practical sessions, featuring 5-15 minute

micro-courses, AI-assisted learning modules, and virtual simulation tools tailored to young employees' learning preferences. Industry associations should spearhead the creation of shared course resources, instructor networks, and platform systems to enable cost-effective access to premium educational materials for small and medium-sized institutions. Implement a robust learning-performance linkage mechanism that integrates learning credits and certifications into performance evaluations and promotion reviews, transforming passive learning into proactive self-directed development.

4.5.3 For practitioners: Establishing a growth pathway of "self-directed planning-scenario integration-community co-learning"

Develop a personalized learning plan following the framework of "compliance baseline + professional core competencies + strategic frontiers," with clearly defined annual learning objectives. Utilize fragmented time slots such as commutes and lunch breaks for micro-learning to integrate work and study seamlessly. Proactively pursue international certifications like CFA and FRM, while applying for Wuhan learning subsidies and talent incentives to achieve dual benefits. Engage in learning communities to draw insights from domestic and international peers and broaden perspectives. Promote industry-academia collaboration by supporting universities and financial institutions in establishing fintech colleges and green finance research centers, developing region-specific courses such as valuation methodologies for Optics Valley tech enterprises and carbon finance product design. Build a "dual-qualified" faculty database by pairing business leaders with university professors as mentors. Host the "Wuhan Financial Lifelong Learning Forum" to invite global experts for sharing cutting-edge practices.

5. Conclusion and Discussion

The following conclusions were drawn from this study.

First, based on the five-dimensional evaluation framework of "organization-task-individual-compliance-regional policy," financial professionals in Wuhan exhibit a "dual-core, three-tier" learning structure: Fintech and compliance policy knowledge form the first-tier core requirements; business skills constitute the second-tier developmental needs; while management capabilities and professional ethics represent the third-tier advanced requirements. Online fragmented courses have become the predominant learning format, characterized by "time fragmentation and micro-lecture formats."

Secondly, the compliance dimension transcends organizational, task, and individual dimensions to emerge as the most influential factor driving learning needs among financial practitioners. This profoundly demonstrates how the industry's' strong regulatory' nature decisively shapes learning behaviors, thereby enriching the application of traditional lifelong learning theories in finance.

Third, significant differences exist in learning needs across different groups: Banks prioritize compliance and financing, while financing companies emphasize technology and skills; younger professionals favor digital learning, mid-career professionals focus on management capabilities, and senior teams rely on experience-based knowledge transfer. Roles in risk control, product development, marketing, and management each have distinct learning priorities. Meanwhile, current learning resources exhibit systemic misalignment in content, format, and availability, with the "last mile" challenge in policy implementation remaining particularly prominent.

Fourth, the five-dimensional demand assessment framework developed in this study demonstrates strong fit with international mainstream financial lifelong learning policy frameworks, offering theoretical value for promotion to financial centers in central and western regions.

Finally, for governments and industry associations, it is essential to establish mandatory continuous professional development systems, create personal learning accounts, and develop regional financial skill standards. For financial institutions, a demand-driven, tiered, and blended training system should be implemented. For practitioners, personalized learning plans should be formulated, aligned with certification requirements and policy incentives, to support Wuhan's development as a nationally significant financial center.

6. Further research recommendations

While this study has established a five-dimensional evaluation framework and yielded valuable insights, it still has limitations. Recommendations include expanding sample scope and conducting comparative studies with financial centers such as Shanghai, Shenzhen, and Singapore. A longitudinal tracking design should be adopted to develop a dynamic model encompassing "policy/technology shocks—demand changes—learning behaviors—capacity enhancement." To refine supply-demand matching mechanisms, international tools like CPD demand assessment and competency gap analysis should be integrated to create a closed-loop system from demand identification to curriculum iteration. Comparative research perspectives should be broadened through horizontal comparisons with other domestic cities and

international financial hubs like New York and London, as well as vertical and cross-national analyses, to identify shared patterns and distinctive pathways. Exploring AI empowerment strategies involves utilizing big data on learning behaviors to construct dynamic demand profiles, developing AI recommendation engines and learning outcome prediction models, and investigating generative AI-assisted curriculum development. The theoretical framework should be further strengthened by incorporating new dimensions such as "technological transformation" and "social capital," conducting cross-industry validation, developing standardized measurement scales, and establishing correlation models between demand assessments and learning outcomes (e.g., performance metrics and career development).

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