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Research on Quality Evaluation System and Precise Enrollment Strategy for Finance Students under the Background of Digital Intelligence

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Abstract: The rapid development of the digital economy has raised higher requirements for the quality of financial talent cultivation, rendering traditional student evaluation systems inadequate for contemporary needs. In recent years, with the continuous implementation of national college entrance examination adjustments, special admission programs have undergone significant restructuring. Particularly at the critical juncture of major policy modifications in 2024, finance and economics institutions must carefully navigate strategies such as the Strong Foundation Program and elite sports teams. This study examines the limitations of traditional student quality assessment systems within the context of digital intelligence, highlighting the importance of transforming evaluation approaches in this era. The digital intelligence era demands a paradigm shift in how financial professionals are assessed, moving beyond conventional metrics toward multidimensional frameworks that integrate technological literacy, analytical reasoning, and practical competencies. Based on this analysis, we propose systematic optimization measures to establish a scientific and precise student quality evaluation framework for finance programs. These initiatives encompass the development of competency-based indicators, the integration of data-driven assessment tools, and the alignment of evaluation criteria with industry demands in the digital economy. Furthermore, this research explores how refined evaluation methodologies can enhance the precision of enrollment strategies, ensuring that admissions processes effectively identify candidates with the aptitude and potential to thrive in modern financial sectors. These initiatives aim to achieve effective alignment between admissions selection and talent development, providing robust support for cultivating high-caliber interdisciplinary financial professionals in the digital economy era. The findings offer actionable insights for educators, policymakers, and institutional administrators seeking to modernize assessment practices and optimize talent acquisition in finance education.

Keywords: digital intelligence; student quality assessment; precision enrollment; financial education; multidimensional evaluation

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1. Introduction

Admissions processes for undergraduate programs and postgraduate employment pathways have attracted sustained attention across educational, policy, and public domains, functioning as pivotal transition points—often described as the 'gateway' for academic entry and the 'outlet' for professional integration. Within finance and economics disciplines, conventional evaluation methods continue to depend heavily on standardized Gaokao scores and relatively brief, unstructured interviews [1]. These approaches exhibit notable limitations in capturing multifaceted competencies essential for contemporary professional practice, including adaptive problem-solving, computational reasoning, data interpretation fluency, ethical digital engagement, and the capacity to synthesize knowledge across disciplinary boundaries. Emerging digital intelligence technologies—including learning analytics platforms, AI-powered simulation environments, competency-based assessment frameworks, and multimodal performance

tracking systems—offer scalable, evidence-informed alternatives. Such tools enable longitudinal, criterion-referenced evaluation of higher-order cognitive and metacognitive skills, support personalized feedback loops, and facilitate alignment between curricular design, pedagogical delivery, and labor market expectations. Their integration requires careful validation, equity-centered implementation protocols, and ongoing stakeholder collaboration to ensure transparency, fairness, and pedagogical integrity.

2. Analysis of Limitations in the Traditional Quality Evaluation System for Finance and Economics Students

Currently, China's finance and economics universities primarily rely on college entrance exam scores as the core admission criterion [2]. This singular evaluation model has become increasingly inadequate in responding to the evolving demands of the digital economy era. The score-centric selection mechanism overemphasizes standardized test performance while systematically underweighting critical non-cognitive attributes such as innovative thinking, adaptive problem-solving, practical application capabilities, and collaborative competencies—qualities that are indispensable for cultivating next-generation financial professionals capable of navigating complex, data-intensive, and cross-sectoral environments. Moreover, traditional evaluation systems depend on relatively closed and fragmented data sources, largely confined to academic transcripts, disciplinary records, and limited standardized assessments. These sources fail to capture students' engagement in authentic social practice activities—including internships, community service, entrepreneurial initiatives, and interdisciplinary project work—as well as their domain-specific interests, learning motivations, resilience under uncertainty, and socio-emotional development. The evaluation process exhibits pronounced static characteristics: it typically relies on isolated, point-in-time snapshots rather than longitudinal, multi-dimensional tracking of cognitive growth, skill acquisition, behavioral adaptation, and developmental trajectories across time. Concurrently, insufficient personalized identification mechanisms hinder precise alignment between individual student profiles—including learning styles, aptitude patterns, career orientation, and contextual background—and the specific pedagogical, curricular, and experiential requirements of distinct finance and economics programs. This misalignment often contributes to academic adaptation challenges, reduced retention rates, and suboptimal utilization of student potential after enrollment. Regional disparities in educational resource distribution further exacerbate these limitations: students from economically developed regions frequently benefit from highly structured, exam-oriented training ecosystems with abundant tutoring support and digital learning infrastructure, whereas students from remote or less-resourced areas—many of whom demonstrate exceptional practical acumen, contextual intelligence, and developmental promise—may be systematically disadvantaged due to score differentials unrelated to their long-term capacity for professional excellence. This not only constrains equitable access but also leads to the underutilization of high-potential human capital. Additionally, traditional admission models lack robust predictive validity frameworks; they do not incorporate validated psychometric indicators, behavioral analytics, or machine-learning-informed forecasting tools to assess students' likely academic progression, research readiness, or career trajectory in emerging domains such as fintech, sustainable finance, or regulatory technology.

3. The Importance of Student Quality Transformation in Finance and Economics Programs under the Digital and Intelligent Transformation Context

3.1. Responding to National Strategies and Serving New Demands of Digital Economy Development

China is currently undergoing a pivotal structural transition—from a global manufacturing hub toward a high-end, innovation-driven manufacturing powerhouse—where the digital economy serves as a strategic engine for sustainable and high-quality

national development [1, 3]. This transformation is underpinned by comprehensive policy frameworks that emphasize technological self-reliance, intelligent infrastructure deployment, and human capital upgrading. Within this context, finance and economics programs face intensified expectations to align talent output with evolving industrial needs, particularly in areas such as algorithmic risk modeling, real-time financial data governance, blockchain-enabled transaction systems, and AI-augmented macroeconomic forecasting. Traditional pedagogical paradigms, historically centered on static theoretical instruction and standardized skill acquisition, are increasingly inadequate for cultivating professionals capable of navigating dynamic, data-intensive, and cross-domain economic environments. Contemporary finance practitioners must integrate rigorous analytical training with fluency in computational tools, ethical awareness of algorithmic bias, and adaptive capacity to interpret rapidly shifting regulatory landscapes shaped by digital innovation. Consequently, higher education institutions are redefining student quality benchmarks—not merely through academic performance metrics, but via holistic assessment of digital literacy (including data visualization, API integration, and cloud-based simulation proficiency), cognitive flexibility across disciplinary boundaries (e.g., merging econometrics with computer science fundamentals), and evidence of solution-oriented innovation in applied economic contexts. Admissions and progression criteria are being recalibrated to prioritize demonstrable competencies in collaborative problem-solving, critical evaluation of digital information sources, and responsible use of intelligent technologies in economic decision-making—ensuring graduates contribute meaningfully to both market efficiency and societal resilience in the intelligent era.

3.2. Reconstructing Evaluation Paradigms to Promote Educational Equity and Personalized Development

By integrating advanced big data analytics and artificial intelligence algorithms, this digital-intelligent evaluation system facilitates a holistic, multi-dimensional, and objectively grounded identification of students' diverse intelligences—including linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalistic capacities—as well as their latent developmental potential. This approach systematically mitigates the inherent limitations and selection biases embedded in conventional uniform evaluation criteria, which often privilege narrow academic metrics such as standardized test scores or rote memorization performance. Crucially, for learners originating from geographically underdeveloped regions or socioeconomically disadvantaged families—where access to high-quality curricular enrichment, extracurricular mentoring, or digital learning infrastructure remains constrained—the system enables nuanced detection of strengths in non-traditional academic domains, such as creative problem-solving, contextual reasoning, collaborative leadership, or practical innovation. Consequently, it expands equitable pathways for recognition and advancement beyond historically dominant assessment paradigms. Furthermore, the design of adaptive, student-centered evaluation frameworks operationalizes the pedagogical principle of differentiated instruction at scale. Since each learner exhibits distinct cognitive architectures, information-processing preferences, metacognitive awareness levels, and developmental pacing, rigid standardization inevitably obscures individual progress. The digital-intelligent model dynamically maps learning preferences, evolving cognitive patterns, affective engagement indicators, and longitudinal developmental trajectories through multimodal data streams—including interactive task responses, reflective journaling analytics, collaborative discourse logs, and formative performance artifacts. These insights furnish universities with empirically grounded, granular evidence to co-design flexible curricula, scaffolded support mechanisms, and individualized competency-based progression plans—thereby optimizing institutional resource deployment while authentically nurturing each student's highest attainable potential.

3.3. Empowering Precision Selection to Enhance Talent Cultivation Alignment in Higher Education Institutions

The core advantage of digital-intelligent evaluation systems lies in their capacity to achieve deep, dynamic integration between enrollment selection and talent cultivation processes, thereby significantly enhancing the efficiency and strategic alignment of educational investment. Underpinned by multidimensional data analysis—including academic performance metrics, psychometric assessments, extracurricular engagement patterns, and longitudinal learning behavior traces—these systems leverage advanced machine learning algorithms to identify candidates whose holistic profile aligns closely with institutional mission, program-specific competencies, and long-term educational objectives. This precision matching extends well beyond traditional academic indicators to systematically incorporate students' professional interests, career aspirations, intrinsic learning motivations, socio-cognitive dispositions, and contextual background factors. When such individual attributes cohere meaningfully with curricular design, pedagogical approaches, and graduate outcome expectations, students demonstrate markedly higher levels of learning initiative, sustained engagement, and professional identity formation. Consequently, institutions observe measurable improvements in academic persistence, course completion rates, capstone project quality, and graduate readiness. Furthermore, targeted selection mitigates structural inefficiencies—including high major-switching incidence, elevated attrition risk, and misallocation of teaching resources—by enabling proactive academic advising and early intervention support. Universities can iteratively refine admission criteria and adapt curriculum delivery models using real-time feedback loops drawn from cohort progression analytics, graduate tracking data, and employer competency validation, thus reinforcing a robust, evidence-informed, and continuously improving talent development ecosystem.

4. Quality Evaluation System for Finance and Economics Students and Precision Admissions Strategies under the Background of Digital Intelligence Transformation

Constructing a Multidimensional Model to Reconstruct Student Enrollment Evaluation Indicators: In the era of digital transformation, the evaluation system for finance and economics students requires establishing a multidimensional assessment model encompassing four core dimensions: cognitive ability, comprehensive literacy, innovative potential, and adaptive character. Regarding cognitive ability, beyond fundamental mathematical logic and language proficiency, emphasis should be placed on evaluating students' data sensitivity and information processing capabilities. For instance, designing data analysis tasks based on real-world business cases allows students to process financial data using statistical software and draw conclusions, thereby observing their quantitative analytical thinking and problem-solving approaches. This includes assessing how effectively students interpret visualized datasets, identify underlying patterns in time-series financial indicators, and translate statistical outputs into actionable economic insights. The comprehensive literacy dimension focuses on interdisciplinary knowledge integration and cultural literacy development, assessing students' understanding of socio-cultural factors behind economic phenomena or their communication and coordination skills demonstrated in simulated business negotiations. It further incorporates ethical reasoning in financial decision-making contexts, such as evaluating trade-offs between profitability and sustainability, or analyzing stakeholder impacts in corporate governance scenarios. The innovative potential dimension is crucial, requiring evaluation of students' critical thinking and creative problem-solving abilities. Open-ended case studies can be employed to encourage students to propose original insights and improvement strategies for emerging fintech trends, with particular attention to the originality of their thinking and logical rigor. This may involve scenario-based assessments where students design novel risk-mitigation frameworks for decentralized finance applications or reconfigure traditional credit scoring models using alternative data sources. The adaptive character dimension primarily evaluates students' psychological resilience and learning adaptability in uncertain environments. Simulated market volatility scenarios or team collaboration challenges can be utilized to assess emotional regulation capabilities and teamwork performance under stress. To ensure

objectivity, behavioral anchors—such as response latency to unexpected parameter shifts, consistency in role assumption during dynamic group tasks, and self-reflection depth in post-simulation debriefs—are systematically recorded. Specific observation indicators and quantifiable standards should be established for each dimension, with analytic hierarchy process (AHP) applied to determine dimension weights, ultimately forming a scientifically sound comprehensive evaluation algorithm [4, 5]. Calibration workshops involving faculty from diverse disciplinary backgrounds help refine rubric thresholds and reduce evaluator bias. This multidimensional evaluation model effectively captures students' competency profiles and developmental potential, enabling a fundamental shift from 'score selection' to 'person selection', while supporting institutional goals of cultivating well-rounded, future-ready professionals equipped for evolving industry demands.

5.1. Integration of Diverse Data to Trace Student Growth Trajectories

Establishing comprehensive data profiles tailored for holistic student development forms the foundational pillar of precision admissions in contemporary higher education. This necessitates the design and implementation of an integrated, interoperable data platform capable of synthesizing heterogeneous information streams across academic, competency-based, and experiential domains. While standardized assessments—such as national college entrance examination scores—and formal academic recognitions—including subject-specific competition awards—continue to serve as essential benchmarks, they represent only static snapshots. To capture developmental nuance, longitudinal indicators must be systematically incorporated: these include learning progression patterns across grade levels, evolving subject engagement profiles (e.g., shifts in depth of inquiry or persistence in STEM versus humanities disciplines), and adaptive learning behaviors observed through formative assessments, digital learning analytics, and teacher narrative evaluations. For example, tracking mathematics performance across six consecutive semesters—from Grade 7 through Grade 12—enables identification of inflection points, resilience under curricular transitions, and responsiveness to pedagogical interventions. Similarly, English language development trajectories can illuminate growth in critical literacy, rhetorical flexibility, and intercultural communicative competence. Comprehensive competency data extends beyond cognitive metrics to encompass demonstrable interpersonal and intrapersonal capacities: leadership is evidenced not merely by title-holding but by initiative-taking, conflict mediation, and sustained mentorship roles; teamwork proficiency is assessed through collaborative project outcomes, peer feedback consistency, and role rotation adaptability; innovative thinking is validated via original problem framing, iterative prototyping in maker spaces, and documented refinement cycles in research or design challenges [6]. Social practice data further grounds development in real-world contexts, drawing from structured internships with measurable deliverables, community-based participatory research with ethical review documentation, and student-led entrepreneurial ventures with sustainability planning and stakeholder impact analysis. Technologically, this integration relies on unified application programming interfaces aligned with national educational data standards, enabling secure, bidirectional synchronization with school administrative systems, provincial practice registries, and accredited online learning environments. Data quality assurance is institutionalized through multi-layered validation: automated logic checks for temporal coherence and outlier thresholds, periodic calibration audits conducted by cross-institutional review panels, and transparent metadata tagging for provenance and update frequency. Student privacy protection is ensured through access governance frameworks that enforce principle-of-minimum-necessity permissions, anonymized analytical processing pipelines, and storage protocols compliant with national information security regulations. The resulting student growth trajectory profile exhibits temporal continuity across developmental stages, conceptual comprehensiveness across cognitive, affective, and behavioral dimensions, and structural standardization to support scalable algorithmic interpretation and equitable comparative analysis.

5.2. Application of Intelligent Algorithms to Achieve Precise Student Profile Generation

Intelligent algorithms serve as a foundational technological enabler for transforming heterogeneous, large-scale educational data—including academic transcripts, learning behavior logs, extracurricular engagement records, assessment outcomes, and longitudinal developmental indicators—into structured, predictive student profile maps. These maps integrate multidimensional attributes to yield actionable, evidence-based insights for pedagogical decision-making. Through unsupervised clustering analysis techniques such as K-means, hierarchical clustering, and DBSCAN, the system autonomously discerns latent groupings among students based on shared patterns in learning pace, cognitive style preferences, domain-specific competency configurations, and trajectory-aligned developmental potential, thereby revealing empirically grounded clustering patterns that reflect natural cohort segmentation. Supervised classification and regression algorithms further construct robust quantitative models to assess student-major compatibility, drawing upon comprehensive historical training datasets encompassing admission profiles, academic progression metrics, capstone project evaluations, internship performance reports, and post-graduation employment and further-study outcomes. Given the substantive epistemological and methodological distinctions across finance-related disciplines, algorithmic design incorporates rigorous discipline-specific parameterization. For data science-intensive majors—including Financial Engineering and Financial Mathematics—the model dynamically adjusts weighting coefficients to emphasize mathematical reasoning proficiency, foundational programming competencies, and advanced quantitative analysis capabilities; key operationalized indicators include demonstrated performance in national and international mathematical modeling competitions, applied proficiency in programming languages such as Python and R, and facility with statistical software platforms including MATLAB, SAS, and STATA. Conversely, for practice-oriented programs such as International Economics & Trade and Insurance Studies, the algorithm prioritizes applied operational skills, cross-cultural communication effectiveness, contextual industry knowledge integration, and adaptive problem-solving in authentic business environments—assessed through performance in standardized business case analyses, outcomes from simulated enterprise management exercises, and documented contributions to international exchange initiatives or collaborative global projects. Additionally, deep feature extraction methods enable the system to uncover subtle, non-linear latent patterns across demographic, behavioral, and psychometric dimensions, facilitating the identification of high-potential candidates whose alignment with program objectives may remain obscured under conventional evaluation frameworks. Upon successful identification, the system generates comprehensive individualized profiles containing academically calibrated projections of future capability development, empirically derived assessments of program adaptability, and early-warning signals for potential academic or skill-acquisition challenges. These granular, precision-oriented profiles provide an objective, data-informed foundation for enrollment decisions, inform the design of differentiated instructional pathways, guide the strategic allocation of academic advising resources, and support the formulation of longitudinal career development planning frameworks aligned with both institutional mission and evolving labor market demands.

5.3. Optimize Communication Strategies and Customize Targeted Recruitment Activities

Higher education institutions must systematically develop differentiated communication strategies that align with the diverse academic backgrounds, cognitive preferences, and value orientations of prospective students [3, 7]. This requires moving beyond generic promotional messaging toward data-informed, learner-centered outreach frameworks. By integrating intelligent recommendation algorithms grounded in educational data mining and behavioral analytics, institutions can dynamically map admission-related content—including program overviews, faculty profiles, curriculum highlights, and career pathway information—to individual candidates' demonstrated

interests, prior academic performance, extracurricular engagement patterns, and stated professional aspirations. For example, applicants with robust quantitative aptitude and documented interest in emerging financial technologies may receive curated digital packages featuring in-depth explorations of algorithmic trading infrastructure, regulatory developments in decentralized finance, and interdisciplinary research initiatives at the intersection of computer science and financial economics. Conversely, students exhibiting strong critical thinking skills in social sciences and humanities—evidenced through essay submissions, debate participation, or community-based projects—may be engaged through narratives emphasizing ethical leadership, policy-oriented financial literacy, and applied learning opportunities in impact measurement, sustainable development financing, and inclusive economic design. In parallel, immersive experiential recruitment methodologies should be institutionalized: virtual reality environments can replicate authentic workplace contexts such as central bank policy simulation labs or fintech startup incubators, while augmented reality overlays can transform static campus brochures into interactive 3D models of teaching laboratories and collaborative learning spaces. Furthermore, AI-enhanced consultation systems must combine robust natural language understanding with empathetic human oversight—capable of detecting linguistic markers of uncertainty, anxiety, or cultural dissonance in student inquiries and responding with contextually calibrated guidance, resource referrals, and timely escalation pathways. A continuous improvement loop is essential: real-time dashboards should track granular engagement metrics—including scroll depth on webpages, video completion rates, chatbot interaction sequences, and follow-up conversion timelines—to iteratively refine both algorithmic matching logic and activity sequencing logic. Such a holistic, responsive, and ethically grounded approach ensures enrollment communication evolves from broad-spectrum dissemination to pedagogically informed, psychologically attuned, and socially responsible attraction.

5.4. Establish a Feedback Loop to Drive System Iterative Optimization

Higher education institutions should establish comprehensive, longitudinal data tracking systems to systematically monitor and document students' academic, cognitive, behavioral, and professional development across their entire educational trajectory—from enrollment through graduation and into early career stages. The foundational step involves designing and implementing an integrated, multi-dimensional evaluation framework that transcends traditional grade-based metrics and incorporates academic achievement, innovative thinking and problem-solving capacity, hands-on practical competence, interdisciplinary collaboration skills, ethical reasoning, and post-graduation employment quality—including occupational relevance, career progression, workplace integration, and long-term professional sustainability. Such a framework necessitates the regular, standardized collection of key performance indicators at critical junctures: entry-level diagnostic assessments, mid-program competency benchmarks, capstone project evaluations, internship and fieldwork appraisals, thesis or final project reviews, and longitudinal alumni surveys conducted at one-, three-, and five-year intervals after graduation. Specific measurable indicators include granular distributions of course-level grades across core and elective domains; frequency and level of recognition in discipline-specific academic competitions; depth and scope of engagement in faculty-mentored research, including authorship contributions and conference presentations; qualitative and quantitative feedback from industry supervisors during internships; rubric-based assessments of thesis originality, methodological rigor, and scholarly communication; and detailed occupational mapping—such as sector alignment, job function congruence with academic training, promotion velocity, and compensation trajectories adjusted for regional economic indices. Advanced statistical techniques—including hierarchical linear modeling, path analysis, and time-lagged correlation matrices—should be applied to rigorously examine predictive relationships between early-stage admission indicators and later developmental outcomes. For instance, the extent of high school participation in structured mathematical modeling activities may be examined for its association with

advanced quantitative reasoning performance in upper-division economics or engineering coursework; similarly, holistic assessments of communication fluency, cultural responsiveness, and adaptive learning behaviors may be correlated with employer-reported measures of team leadership and organizational agility. Machine learning approaches—including ensemble methods and explainable AI models—can then be deployed to iteratively recalibrate indicator weightings, detect emergent competency patterns, and enhance model generalizability across diverse institutional contexts. To ensure methodological integrity and stakeholder accountability, formal validation cycles must be institutionalized, engaging multidisciplinary review panels composed of pedagogical researchers, disciplinary practitioners, and representative alumni cohorts. This establishes a robust, self-correcting closed-loop system—data collection → cross-temporal association analysis → algorithmic model refinement → empirical effect validation → strategic policy adjustment—that continuously aligns evaluation design with evolving societal expectations, labor market dynamics, and national talent development priorities [6].

6. Conclusion

In conclusion, adapting the quality evaluation framework for finance and economics students to the evolving demands of the digital and intelligent era is both timely and necessary. This adaptation entails moving beyond traditional, uni-dimensional metrics—such as standardized test scores or grade point averages—toward scientifically grounded, multidimensional models that integrate cognitive competencies, analytical reasoning, data literacy, ethical judgment, adaptive problem-solving, and domain-specific technical fluency. Such models must be empirically validated, algorithmically transparent, and pedagogically aligned with curricular objectives. Higher education institutions are encouraged to advance digital transformation initiatives by embedding real-time learning analytics, leveraging longitudinal academic datasets, and implementing adaptive assessment protocols that support individualized feedback loops. Data-informed enrollment mechanisms can enhance predictive validity in student selection while mitigating systemic biases through rigorous fairness auditing. Evaluation dimensions should be broadened methodologically—not merely expanded—to encompass formative, summative, peer-, self-, and portfolio-based modalities, each calibrated for reliability and contextual relevance.

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