

Patience Capital in the Cultivation of Top Innovative Undergraduate Talents: A Four-Dimensional Analytical Framework

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Abstract

The cultivation of top innovative talents has become the strategic core of building a powerful country through higher education in the new era. However, the efficiency paradox between resource input and talent output has long plagued educational practice, whose deep root lies in the absence of a patience logic in the training system. As an economic concept, patience capital emphasizes long-term investment, risk tolerance, and strategic commitment, which is highly consistent with the growth law of top innovative talents. Using the conceptual research method, this study introduces patience capital into the field of education, defines the concept of patience capital in the context of top innovative talent cultivation, and constructs a four-dimensional analytical framework consisting of temporal resources, error-tolerant resources, relational resources, and cultural resources. Applying this framework to examine the current situation of top innovative talent cultivation in China, we can see dilemmas such as accelerationism squeezing the cultivation cycle, performatism dispelling the spirit of exploration, instrumentalization of teacher-student relationships, and superficial coating of growth culture. To solve these dilemmas, we can systematically reconstruct the system from four dimensions: time perspective, evaluation perspective, teacher-student perspective, and resource perspective, promoting the shift of talent cultivation from a hot money logic to a patience logic and moving toward a nurturing cultivation model. For University Administrators Substantially promote flexible schooling reform and extend the evaluation cycle to the whole undergraduate period. Establish a “valuable failure” identification mechanism to provide institutional tolerance for high-risk exploration. Invest in teacher-student relationship construction, reduce supervisors’ burdens, and create non-utilitarian dialogue space.

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Keywords: Patience Capital; Top Innovative Talents; Temporal Resources; Relational Resources; Teacher-Student Resources; Cultural Resources

Introduction

Over the past two decades, China's higher education has continuously increased investment in the cultivation of top innovative talents. Since the launch of the Pilot Program for the Cultivation of Top Students in Basic Disciplines (hereafter referred to as the "Top Talent Program") in 2009 and the full implementation of the Strong Foundation Program in 2020, various honors colleges and pilot classes have mushroomed. These programs provide generous research funding, top-tier faculty, and international exchange opportunities, seemingly building a "fast track" toward top innovative talents. Nevertheless, a deep-seated confusion has lingered in educational practice and theoretical research: why, despite increasingly intensive resource input, do we still feel a lack of original innovation and find "master-level" talents rare?

Behind this confusion lies a worrying efficiency paradox: the more universities attempt to pursue short-term performance in top talent cultivation through refined management, the more likely they are to inhibit the "potential for original innovation" that requires long-term nurturing and gradual development. Liu, T. Y. (2025) found that the widely implemented dynamic admission and elimination mechanism in China's current top innovative talent cultivation simplifies the complex process of talent growth into a black-and-white terminal judgment, forcing students to devote considerable energy to peer competition. Meanwhile, young students are trapped in a paradoxical state of "the busier, the more confused; the more confused, the busier", reflecting vague or even missing life goals (Chen, Y. F., 2024). When daily examinations are overloaded with selection and screening functions, they violate students' cognitive development laws and deviate from the educational purpose of evaluation (Feng, H., 2025).

These phenomena collectively point to a rush culture in the current training system: students busy raising GPAs and piling up resumes, supervisors regard students as academic laborers under assessment pressure, and administrators are keen on counting highlight data to demonstrate effectiveness. This short-cycle, high-performance, low-tolerance logic can be aptly described by an economic concept: the hot money logic. In contrast, the growth of top innovative talents follows the opposite path. Both classic research on talent development by Subotnik R. F. et al. (2011), and Bloom, B. S. &



Gage, N. L. (1985) tracing of outstanding talents ' growth trajectories lead to a common conclusion: major original innovations often require long-term focused investment, protected trial-and-error space, and nourishment of non-utilitarian academic interests. Such a cultivation logic requires matching patience capital.

Against this background, this study attempts to introduce the concept of patience capital into education and construct an institutional framework for analyzing the cultivation of top innovative undergraduate talents in China. Specifically, this study aims to answer the following questions: In the current institutional environment for cultivating top innovative undergraduate talents, how is patience capital possible? What are the institutional symptoms of its absence? And how can it be re-embedded into the training system at the institutional level?

Objective

1. To reconceptualize patience capital in the context of top innovative undergraduate talent cultivation and clarify its educational connotation.
2. To construct an analytical framework for examining the institutional conditions of top innovative talent cultivation.
3. To examine the institutional dilemmas of China's Top Talent Program using this framework.
4. To propose institutional pathways for fostering patience capital in higher education.

Review of literature and ideas

Theoretical Origin and Core Characteristics of Patience Capital

Patience capital is a core topic in comparative political economy and is regarded as an important factor distinguishing different political economies (Li, S. X. et al., 2024). Theoretically, the idea of patience capital can be traced back to long-term and value investment practices on Wall Street in the 20th century. Lin, Y. F. & Wang, Y. (2017) defined it as ultra-long-term capital invested in a "relationship", where investors are willing to see the investee develop in the future for considerable returns. Li, S. L. (2026) further explained that patience capital is long-term capital oriented by long-term market demand, full of confidence in future social and economic development, with expectations for long-term benefits and moderate-to-high risk tolerance.



Synthesizing academic research, the core characteristics of patience capital can be summarized into three aspects: Firstly, long investment horizon. Patience capital focuses on long-term value creation, spans economic cyclical fluctuations, and provides stable financial support for long-term development goals (Deeg, R. & Hardie, I., 2016). Secondly, inclusive risk preference. It has high risk-bearing capacity, accepts no returns or even losses over a long period, and is less affected by short-term market fluctuations (Li, S. X. et al., 2024). Gong, L. et al. (2026) further pointed out that tolerance for failure drives breakthroughs in key core technologies through cyclic learning and stimulates disruptive innovation through free exploration. Thirdly, strategic value orientation. It combines market attributes and national strategic functions, emphasizes the whole industrial chain investment covering technological innovation to achievement transformation, and realizes in-depth industrial upgrading and value reconstruction through whole-chain integration and coordination.

Notably, the formation of patience capital requires specific institutional environments and cultural soil. Lin, Y. F. & Wang, Y. (2017) noted that long-term orientation can be seen as a cultural endowment, and many Asian economies influenced by Confucianism show evidence of long-term orientation and accumulate substantial patience capital. Jiang, B. J. & Wu, Q. C. (2024) introduced patience capital into vocational education research and discussed its supporting role in young people's skill acquisition, providing an important reference for this study. International Perspectives and Chinese Research on Top Innovative Talent Cultivation Subotnik R. F. et al. (2011) proposed that talent development is a long-term process from potential to expertise, requiring sustained investment, support, and appropriate educational intervention, influenced by psychosocial variables such as motivation and resilience. Bloom B. S. & Gage, N. L. (1985) classic study of eminent figures across fields revealed that talent development usually undergoes three stages: early playful engagement, middle systematic training, and later elaboration and personal style formation, each requiring different types of support, highlighting the importance of long-term, developmentally appropriate investment in talent cultivation.

International scholars have paid increasing attention to the institutional conditions of higher education talent cultivation, examining the impacts of mentoring, research opportunities, and academic culture on student development. However, most studies focus on individual factors, and the understanding of how institutional logic shapes the talent development environment remains insufficient. Chinese scholars have conducted extensive research on top innovative talent cultivation. Yan, K. & Wu, H. (2020) summarized



the main international trends and analyzed their driving factors. Li L. G. & Chen, X. Y. (2025) reviewed the institutional evolution in China from the “Teenager Class” to “Base Classes” and then to the Top Talent Program. These studies provide rich references for institutional design but mostly focus on the transplantation of explicit institutions, rarely touching on implicit institutions such as evaluation orientation, error tolerance mechanisms, and non-utilitarian teacher-student interaction.

Capital Theories in Education

Research on capital theories in education shows diversified, interdisciplinary, and contextually localized trends. Overall, the research focus is expanding from traditional cultural capital to broader educational value forms such as educational capital, social capital, and psychological capital, deeply penetrating basic education, vocational education, and higher education. Bourdieu, P. (1986) regarded cultural capital as a key variable explaining social stratification and educational inequality, revealing how cultural capital affects educational achievement and social mobility through family background (Bourdieu, P. & Passeron, J. C., 1990). Traditional human capital theory focuses on the direct contribution of education to economic growth, but Chinese scholars have recently explored the concept of educational capital, emphasizing education itself as an independent capital form with unique movement laws. Fan, Y. X. (2018) systematically constructed the concept of educational capital, defining it as “capital that relies on educational relationships and transforms educational content, ideas, and abilities into learners’ educational benefits in the long-term educational process”. Liu, S. S. (2014) introduced the concept of “teacher educational capital”, distinguishing tangible and intangible capital and noting the multiplier effect of intangible capital. Su, C. J. & Zhao, C. L. (2010) used Bourdieu’s capital theory to analyze the formation of “problem students”, revealing how unequal distribution of educational capital disadvantages certain groups. These studies enrich the understanding of capital operation in education but still need to explore how to translate capital theory into specific educational interventions.

Performance Culture in Chinese Higher Education and Its Critique

The rise of performance evaluation in higher education has attracted wide attention. Slaughter, S. & Leslie, L. L. (1997) proposed the concept of academic capitalism, describing the growing market orientation of universities that reshapes academic work and institutional priorities. In the Chinese context, scholars have critically examined the proliferation of quantitative performance indicators and their impacts on educational quality. Jin, S. (2022)



put forward the concept of educational coating, arguing that modern educational mechanisms produce various symbolic signs coated on learners, leading to utilitarianism, instrumentalization, and involution in modern education. Shao, Z. B. (2022) revealed from the perspective of educational capitalization how the profit-seeking orientation of capital constructs sophisticated exam-oriented education, creates anxious educational underdogs, and hides profound social risks. These critiques provide important intellectual resources for reflecting on top innovative talent cultivation, but most target the overall university or teacher evaluation, and institutional criticism specifically for the special group of top students remains to be deepened.

In summary, the literature review reveals three critical gaps: Firstly, although existing studies have confirmed that top innovative talent growth requires long-termism, and critical educational studies have revealed deep problems such as educational capitalization and educational coating, there is a lack of an effective meso-level analytical tool to connect macro institutional criticism with micro talent growth laws, thus explaining “why patience is needed but institutions create impatience”. Secondly, although patience capital theory has been formed in economics and applied to technological innovation and vocational education research, its application in higher education talent cultivation is extremely scarce. Thirdly, existing educational capital theories mainly focus on resource-based capital owned by individuals or institutions, lacking systematic discussion on the institutional logic governing how resources are allocated, evaluated, and maintained in the long run. Based on these gaps, this study intends to introduce the economic concept of patience capital into educational research and construct a theoretical analytical framework, providing both theoretical support for understanding the institutional conditions of top innovative talent cultivation and practical guidance for the reform of China’s higher education talent training system.

Research scope

Scope of content

Patience Capital in the Cultivation of Top Innovative Undergraduate Talents: A Four-Dimensional Analytical Framework had study Scope of content There are details. Theoretical Origin and Core Characteristics of Patience Capital, Capital Theories in Education, Performance Culture in Chinese Higher Education and Its Critique, Capital Theories in Education, and Performance Culture in Chinese Higher Education and Its Critique



Research Methodology

This study adopts the conceptual research method, developing an institutional framework for analyzing top innovative undergraduate talent cultivation through theoretical construction and logical deduction. Conceptual research has a long tradition in social sciences; it constructs new theoretical frameworks by integrating existing theories, distinguishing concepts, and deducing logic (Jaakkola, E., 2020; MacInnis, D. J. 2011). This method is particularly suitable when existing theories cannot fully explain a phenomenon, when theories from different fields need integration, or when new analytical tools need to be developed to guide subsequent empirical research.

A conceptual model is an important output of conceptual research. It describes entities and clarifies issues to be considered, explaining mechanisms by revealing antecedents, consequences, and contextual conditions related to core constructs (Meredith, J., 1993; MacInnis, D. J., 2011). In this study, the analytical framework is a conceptual model with patience capital as the core construct, revealing the institutional logic of top innovative talent cultivation through different dimensions, and analyzing how institutional absence causes dilemmas and how institutional reconstruction functions under different contextual conditions.

The choice of conceptual research is mainly based on the following considerations: To begin with, patience capital, as a concept originating from economics, needs careful “concept traveling” and “concept reconstruction” to clarify its connotation in the educational context. Furthermore, top innovative talent cultivation involves multiple theoretical traditions, including talent development theory, educational capital theory, and organizational sociology, which require integration into a systematic analytical framework. Ultimately, this study aims to develop an analytical tool testable by subsequent empirical research, which is exactly the goal of conceptual research.

Data Sources

The analysis is based on three types of data sources: (1) Policy texts. Systematic collection of national-level policy documents on top innovative talent cultivation since 2009, providing basic materials for understanding institutional design and evolution. (2) Existing empirical studies. Extensive review of empirical research on China’s top innovative talent cultivation, including follow-up surveys of Top Talent Program students, international trend analyses, and comparative studies of cultivation models, providing an empirical basis for institutional examination. (3) Theoretical literature.



Systematic review of key literature in patience capital theory, talent development theory, educational capital theory, and critical research on higher education performance, providing theoretical resources for framework construction.

Steps of Framework Construction

This study follows the core steps of conceptual research, gradually building the analytical framework from abstract to concrete and from logical deduction to application analysis: Step 1: Concept traveling. Introduce patience capital from economics to education, analyze the comparability between the two fields, and reconceptualize it in education to define its meaning in the context of top innovative talent cultivation. Step 2: Dimension decomposition. Decompose educational patience capital into different dimensions corresponding to key elements in talent cultivation, based on existing theoretical interpretations and the special laws of top talent growth. Step 3: Framework construction. Integrate dimensions into a systematic analytical framework, clarifying the core meaning and institutional orientation of each dimension, and revealing the internal structure of the framework through logical relationships among dimensions. Step 4: Framework application. Use the constructed framework to examine the institutional environment of China's top innovative talent cultivation, identify institutional symptoms of patience capital absence, and propose pathways for institutional reconstruction.

Validity Assurance

To ensure rigor and credibility, this study adopts the following measures: (1) Triangulation. Comprehensive use of policy texts, existing empirical studies, and theoretical literature, with mutual verification of multi-source data to enhance reliability. (2) Peer feedback. Multiple discussions with research teams and peers on the rationality and explanatory power of the framework, absorbing constructive suggestions for revision. (3) Transparent presentation. Clearly presenting the logical process and basis of framework construction in this study, enabling readers to judge the credibility of conclusions.

Results

Theoretical Construction

Patience Capital in the Educational Context

Feasibility of Concept Traveling. The transfer of patience capital from economics to education is rooted in deep isomorphism between the two fields: Firstly, isomorphism of input-output logic. Economic capital investment pursues future returns, and educational



talent cultivation follows the same input-output logic, with families, society, and the state investing resources expecting long-term returns of individual growth, social progress, and national development. Secondly, similarity of time-risk structure. Long-term economic investment faces long cycles, high uncertainty, and large sunk costs; educational talent cultivation also has long-cycle and high-failure-risk characteristics. The growth of top innovative talents is a cross-stage, long-cycle complex process requiring key opportunities or specific scenario tempering (Zhang, X. C., 2025). Thirdly, analogy of relationship-trust mechanism. The core of patience capital is investing in a “relationship”, coordinating stakeholders to share costs, duration, and risks (Lin, Y. F. & Wang, Y., 2017); the educational process also relies on trust and cooperation between teachers and students, families and schools, and universities and society.

Definition and Connotation of Patience Capital in Top Innovative Talent Cultivation. To clarify the logical vein of patience capital traveling from economics to education, this study systematically reviews existing policies, research findings, theoretical viewpoints, and typical cases, classifying them according to the development stages of China’s top innovative talent cultivation policies (Dai, Y. & Yang, Y. W., 2024). Table 1 shows this analytical process.

Table 1 Correlation Analysis Between Existing Research and the Reconstruction of Patience Capital

Stages of Top Talent Cultivation	Policy Events	Theoretical Viewpoints	Case Verification	Factor Association with Patience Capital	Key Orientation
Pilot Exploration Period (1978–1989)	Establishment of the Special Class for Gifted Young at USTC (1978); Promotion in 12 universities (1984- 1985).	Discover, select, and cultivate outstanding talents by breaking conventions (Deng, 1978); Talent development requires early identification and long-cycle cultivation (Bloom, B. S., & Gage, N. L. 1985; Subotnik R. F., et al. (2011); Cultural capital is key to educational reproduction (Bourdieu, P., 1986).	The Special Class provided an early model for gifted education and cultivated scientific and technological talents.	Embodies naive cognition of patience capital; Guarantees time through early identification and long-cycle training; Tolerance for failure in exploration spirit.	Cultivation cycle; . Tolerance for failure; . Cultural capital.
Rational Reflection Period (1990–2011)	Construction of National Science Basic Discipline Research and Teaching Talent Bases(1990s); Launch of Top Talent	Reflection on local innovation and self-cultivation models; Select and cultivate top students from the source,	Institutional guarantee for basic discipline talents; Initial formation of mentoring, small-class,	Institutional recognition of patience capital; Emphasis on long-term value of basic research;	Cultivation cycle; Teacher-student relationship.



Stages of Top Talent Cultivation	Policy Events	Theoretical Viewpoints	Case Verification	Factor Association with Patience Capital	Key Orientation
	Program(2009); Implementation of Excellent Engineer Program(2010).	emphasizing general education and individualized development; Redefine “top talent” with individual differences.	personalized, and internationalized models.	Mentoring exploration lays foundation for teacher-student relationship investment.	
	Implementation of Top Talent Program 2.0 (2018); Excellent Engineer Program 2.0 (2018); Launch of Strong Foundation Program (2020); Pilot Construction of Future Technology Institutes (2020); Implementation of New Era Education Evaluation Reform (2020).	Educational capital transforms benefits through educational relationships (Fan, Y. X., 2018); Capitalization alienates educational quality (Shao, Z. B., 2022); Dynamic entry-exit leads to over-selection and under-cultivation (Liu, T. Y., 2025); Rigid schooling weakens stage connection (Zhang, X. C., 2025); Tolerance for failure drives key tech breakthroughs (Gong, L. et al., 2026).	ETH Zurich “Original and High-Risk Idea Certification”; Oxford-Cambridge collegiate system; Exploration of flexible schooling and undergraduate-postgra duate integration; Reform of student evaluation.	Institutional responses to patience capital; Flexible schooling and integration construct temporal resources; Mentoring and college systems foster relationships; International cases reference tolerance and relationships; Evaluation reform emphasizes value leadership; Need patience logic as correction..	Cultivation cycle; Tolerance for failure; Teacher-student relationship; Cultural education.

Based on the above analysis, this study reconstrue patience capital in the context of China’s top innovative talent cultivation: Patience capital refers to institutional resources, emotional support, and evaluation space that aim to discover and stimulate students’ long-term development and innovative potential, do not care about short-term quantifiable outputs, tolerate exploratory failure, and are willing to invest continuously over a long cycle. This definition includes four layers of connotation: First, long-term goal orientation. The fundamental goal is not short-term performance during schooling but long-term development potential and original innovation ability. Second, nurturing value orientation. It adheres to a nurturing logic, believing that real innovation potential needs time nourishment, reflected in respect for “useless learning”, appreciation for “slow efforts”, and protection of non-utilitarian academic interests. Third, inclusive risk attitude. High risk-bearing capacity and inclusiveness provide error-tolerant space



and form a risk-sharing innovation ecosystem, meaning tolerance for “valuable failure” and protection of non-consensus innovation and non-mainstream growth paths. Finally, relational operation mechanism. Educational patience capital relies on a “relationship” — deep connection between teachers and students based on academic interest and personality trust, long-term commitment beyond utilitarian calculation between schools and students, and mutual expectation based on common values between society and universities.

Unique Positioning of Patience Capital in Education. Different from existing educational capital concepts focusing on “what resources individuals have” or “what conditions the field provides”, patience capital addresses a more fundamental question: what logic governs the allocation of educational resources, what yardstick measures growth in the evaluation system, and in what way do teacher-student relationships exist? This unique positioning is reflected in three levels: Firstly, patience capital is meta-capital. It is not a direct resource constituting students’ competitiveness but an institutional logic regulating how other capitals are mobilized, functioned, and appreciated in the long run — it determines “how capital becomes capital”. Secondly, patience capital institutionalizes patience as structural resources. Existing studies mostly regard patience as individual virtue or psychological trait,

while patience capital elevates it to structural resources encouraged or suppressed by institutional design, existing in flexible schooling, error-tolerant mechanisms, mentoring relationships, and organizational culture rather than relying on accidental individual endowments. Thirdly, Patience capital responds to the core paradox of top talent cultivation. The dilemma of the current system lies in managing a cause that should be nurtured by patience capital with hot money logic. The introduction of patience capital provides a theoretical tool for examining this paradox and a direction for institutional reconstruction.

Four-Dimensional Analytical Framework of Patience Capital

To transform patience capital from an abstract concept into an operational analytical tool, dimensional decomposition is needed. This study constructs a four-dimensional framework including temporal resources, error-tolerant resources, relational resources, and cultural resources, corresponding to cycle setting, risk attitude, teacher-student relationship, and organizational atmosphere in top talent cultivation. The four



dimensions are interrelated and mutually supportive, jointly constituting the institutional connotation of patience capital.

1. Temporal resources (basic dimension): Acknowledge the non-linearity of talent growth and provide sufficient time for academic potential.

2. Error-tolerant resources (risk dimension): Acknowledge the high risk of innovation and provide institutional tolerance for “valuable failure”.

3. Relational resources (interactive dimension): Acknowledge education as spiritual encounter between people and provide an interpersonal carrier for teacher-student community.

4. Cultural resources (value dimension): Acknowledge the deep value of “useless learning” and provide value support for academic curiosity and all-round development.

This internal structure provides a theoretical premise for subsequent institutional examination and pathway design. As shown in Figure 1.

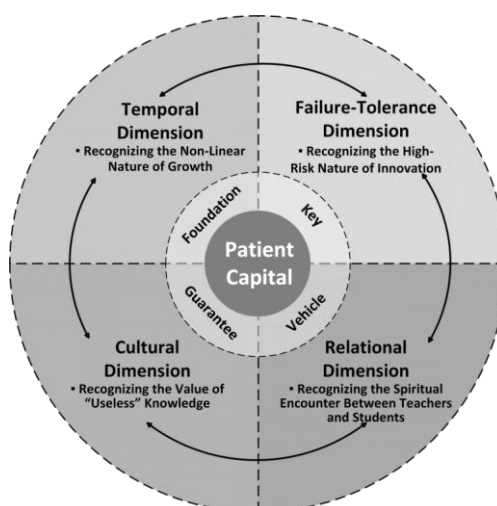


Figure 1 Four-Dimensional Framework of Patience Capital for Top Innovative Talent Cultivation

Conclusion, Discussion and Suggestion

Summary

Table 2 Summary of Novel Contributions

Type	Specific Content	Theoretical Significance	Practical Value
Conceptual Innovation	Introducing patience capital into educational research and completing conceptual reconstruction	Filling theoretical gaps in talent development research	Providing conceptual basis for institutional design
Tool Innovation	Constructing a four-dimensional analytical framework of time, error tolerance, relationship, and culture	Operationalizing abstract concepts into analyzable dimensions	Providing analytical tools for institutional examination
Application Innovation	Examining practical cultivation models, revealing institutional dilemmas and reconstruction pathways	Providing a theoretical perspective for understanding the Chinese context	Providing guidance plans for reform practice

Institutional Review

Using the four-dimensional framework, this study systematically examines the current institutional environment of China's top innovative talent cultivation, revealing the absence and alienation of patience capital in four dimensions.

Scarcity of Temporal Resources: Accelerationism Squeezing the Growth Cycle
Accelerationism prevails in current top talent cultivation, requiring students to complete more academic tasks and produce more quantifiable outputs in the shortest possible time. Firstly, dual squeeze of credit system and rigid schooling. Fixed schooling cuts complex growth into equal time units, ignoring differences among students, disciplines, and innovation types. Top students need more time for in-depth research, slowed courses, and scientific exploration, which are hard to meet in rigid systems. Secondly, haste in undergraduate-postgraduate connection. Many universities implement integrated undergraduate-master-doctor programs, but "integration" is often alienated into "haste", requiring students to take graduate courses early, join research groups early, and produce results early, leading to lack of in-depth thinking and solid training in academic accumulation. Thirdly, absence of long-cycle evaluation mechanisms. Semester/annual evaluation systems force students to focus on the present rather than the long term, choosing short-term result-oriented directions over long-term valuable exploration.



Shortage of Error-Tolerant Resources: Performatism Dispelling the Spirit of Exploration
Current cultivation lacks due tolerance for failure, and performative evaluation dispels students' exploration spirit and academic courage. Firstly, GPA ranking and refined egoistic rational choice. GPA as a core quantitative indicator in scholarships and postgraduate recommendation makes students avoid challenging courses and projects, rationally calculating within the institutional framework. Secondly, vicious circle of dynamic entry-exit and risk aversion. The over-emphasis on screening in the dynamic mechanism ignores the educational essence of cultivating people, intensifying risk aversion and anxiety of elimination, making students dare not try potentially failed research directions. Thirdly, success rate orientation in research evaluation. Teachers also lack error tolerance under promotion and assessment pressure, turning to “short, flat, fast” research and daring not let students undertake high-risk, long-cycle projects.

Decline of Relational Resources: Instrumentalization Eroding the Teacher-Student Community
Teacher-student relationships are increasingly instrumentalized, weakening deep connections based on academic interest and personality trust. Firstly, formalized mentoring. Many undergraduate mentoring systems only involve one or two brief meetings per semester; supervisors do not understand students' interests and puzzles, and students cannot feel academic guidance and personality influence, failing to form a real “guidance-assistance-learning” community. Secondly, alienation of teacher-student relationships.

Supervisors under assessment pressure demand quick results for project completion and publication, reducing interaction to transactional “boss-employee” relations, marginalizing deep educational functions such as academic inheritance, spiritual guidance, and personality edification. Thirdly, fragmentation of academic community. Credit and course selection systems fragment students' academic lives, weakening course, class, and grade boundaries, making it hard to form stable communities based on common academic pursuit. College system attempts mostly stay at accommodation management, failing to create interdisciplinary and cross-grade academic community atmosphere. **Distortion of Cultural Resources: Coating Obscuring “Useless Learning”**

Performance culture pervades universities, and coating obscures organizational respect for “useless learning”. Firstly, educational coating replacing real growth. Educational coating replaces true benefits, with symbols such as scores, certificates, degrees, awards, and GPAs coating students, making them chase evaluable signs rather than internal growth, leading to educational utilitarianism (Jin, S., 2022). Secondly, “usefulness” logic squeezing



“useless learning”. Performatism incorporates all education into input-output quantitative assessment, measuring by immediate utility, systematically squeezing fields unable to quickly transform into economic or social benefits, and squeezing out seemingly useless but long-term valuable research. Thirdly, coated survival state of young students. Students are trapped in coating competition; physical “busyness” masks spiritual “confusion”, crazy involution hides deep meaninglessness (Chen, Y. E., 2024), losing time for inner dialogue and chance to discover real interests.

Discussion

Path Desig

Based on the four-dimensional absence revealed in institutional review, this study proposes institutional reconstruction pathways from time, evaluation, teacher-student, and resource perspectives, promoting the shift from hot money logic to patience logic and toward a nurturing cultivation model.

Reconstructing Time: Developing a “Long-Cycle, Node-Based” Cultivation System

To address temporal scarcity, shift from linear, equal “production process” to flexible and individualized time institutions. First, substantially implement flexible schooling. Flexible schooling should allow students to independently choose graduation within 3–6 years according to development needs, providing sufficient time and space for in-depth research, challenging scientific projects, academic travel, or practical exploration. Next, explore node-based undergraduate-doctorate integration. Take key academic nodes such as qualification examinations, original proposals, and mid-term assessments as guidance; students enter the next stage only after completing core node requirements, with flexible completion time to realize orderly connection rather than simple time compression. Finally, establish long-cycle evaluation mechanisms. Extend evaluation from semesters/years to the whole undergraduate period and post-graduation tracking; establish an “academic growth portfolio” to record research progress, achievements, and growth trajectories; explore post-graduation tracking evaluation as an important indicator of cultivation quality.

Reconstructing Evaluation: Creating a “Process-and Representative Work-Oriented” Academic Portfolio

The shortage of error-tolerant resources stems from over-reliance on short-term quantitative indicators; shift evaluation focus from result-oriented to process-result



balance. First, incorporate process performance into evaluation. Construct a process-oriented error-tolerant mechanism, embedding tolerance for failure into the governance structure of innovative processes (Gong, L., et al., 2026), assessing academic potential such as problem-posing ability, perseverance in difficulties, and learning from failure through supervisor evaluation, peer review, and self-reflection reports. Next, establish representative work evaluation. Students can submit 1–2 works representing their academic level for scholarships and postgraduate recommendation, with in-depth reflection on research process, innovations, difficulties, and solutions, evaluated qualitatively by peer review committees. Then, establish “valuable failure” identification mechanism. Set up identification procedures for exploratory failure; students conducting high-risk original research who fail to achieve expected results can submit failure analysis reports, which are included in academic archives after academic committee recognition and given appropriate preference in evaluation, turning failure from a negative label into a learning resource. Finally, introduce academic resilience evaluation. Assess students’ coping ability, perseverance, and growth in academic dilemmas through psychological assessment, supervisor interviews, and growth trajectory analysis.

Reconstructing Teacher-Student Relations: Building an “Academic Life Community” via Mentorship

The key to solving relational decline is to return teacher-student relationships from instrumentalization to life-to-life influence, building deep connections based on academic interest and personality trust. First, from mentoring to guidance-assistance-learning community. Draw on mature college system experience to build cross-grade networks involving supervisors, students, counselors, and upperclassmen. Systematically reduce supervisors’ burdens to focus on long-term non-utilitarian relationship cultivation. Next, establish institutional space for non-utilitarian dialogue. Set up informal mechanisms such as “academic salons” and “cross-border seminars” to encourage free discussion on academic frontiers, life puzzles, and value pursuits. Support teachers and students to participate in fieldwork and cultural experiences outside academic conferences, deepening emotional bonds and academic tacit understanding in practical scenarios. Then, build long-term alumni-student connection mechanisms. Establish an “alumni mentor” system, inviting outstanding alumni to participate in student cultivation, and organize regular “alumni homecoming days”



and “alumni salons” to create in-depth communication opportunities, providing personalized guidance for academic development and career planning. Finally, include relationship quality in educational evaluation. Explore incorporating relationship quality into supervisor assessment and student evaluation, comprehensively assessing intimacy, trust, and educational influence through teacher-student mutual evaluation, in-depth interviews, and growth archive analysis.

Reconstructing Resources: Implementing “Seed-Risk” Support Mechanisms

To address cultural distortion, establish a resource allocation mechanism that tolerates risk, encourages exploration, and supports “useless learning”. First, set up “high-risk, high-return” research special funds. Support projects with original potential but short-term difficulty in output and possible failure; evaluation focuses on the value of failure — as long as the research process is standardized, the exploration idea is valuable, and failure experience is summarizable, affirmation should be given. Next, establish “non-consensus innovation” support mechanism. Provide “protection periods” and “seed funding” for explorations different from mainstream paradigms but with potential value, introducing a “non-consensus” evaluation dimension in project review. Then, build “failure experience” knowledge transformation mechanism. Regularly hold academic failure sharing sessions, establish failure case databases, set up “best failure” awards, turning failure from shameful concealment into sharable resources. Finally, enrich institutional space for “useless learning”. Strengthen general education and basic discipline training, providing opportunities to contact “big problems”, read “great classics”, and think “big ideas”; support student clubs, reading groups, and other informal learning spaces; explore an “academic fallow” system allowing free exploration after completing core requirements without short-term assessment constraints.

Conclusion

This study introduces the economic concept of patience capital into education and constructs a four-dimensional framework for analyzing top innovative undergraduate talent cultivation. Through systematic research on the economic origin, educational reconstruction, four-dimensional framework, institutional review, and pathway design of patience capital, the main conclusions are as follows:

1. The educational connotation of patience capital reveals the institutional logic essence of talent cultivation. Positioning patience capital as institutional resources, emotional support, and evaluation space elevates patience from individual virtue to



institutional attribute and expands capital from resource possession to logic regulation. As meta-capital, patience capital focuses on the logic of resource allocation, a long-neglected dimension in existing educational capital theories.

2.The institutional dilemma of top innovative talent cultivation roots in the tension between patience logic and hot money logic. The four-dimensional framework examinations that temporal scarcity traps growth in accelerationism, error-tolerant shortage imprisons innovation in performatism, relational decline reduces teachers and students to instrumental relationships, and cultural distortion alienates universities into coating factories — together constituting the institutional root of the efficiency paradox. This shows the dilemma is not insufficient resources but wrong resource allocation logic.

3. Moving toward a nurturing cultivation model requires four-dimensional collaborative institutional reconstruction. The four pathways are interrelated and mutually supportive: time reconstruction provides cycle guarantee, evaluation reconstruction directly responds to core student concerns, teacher-student reconstruction implements institutional goodwill in interpersonal interaction, and resource reconstruction provides material conditions for cultural cultivation. The key to cultivating top innovative talents is not more investment but patient investment, not acceleration but nurturing.

At a deeper level, the institutionalization of patience capital is a fundamental reconstruction of cultivation logic — from hot money logic to patience logic, from selection-elimination mode to nurturing-growth mode, from short-term performance pursuit to long-termism of “sharpening a sword in ten years”. The practical urgency of this shift comes not only from the internal needs of top talent cultivation but also from the macro requirements of national development strategy. Cultivating and developing patience capital is an important support for promoting scientific and technological innovation and industrial upgrading, and also of strategic significance for higher education. Only by establishing an institutional environment for nurturing top innovative talents can we truly answer the “Qian Xuesen Question” and provide talent support for achieving high-level self-reliance in science and technology.

Suggestions

For University Administrators:

- Substantially promote flexible schooling reform and extend the evaluation cycle to the whole undergraduate period.



- Establish a “valuable failure” identification mechanism to provide institutional tolerance for high-risk exploration.

- Invest in teacher-student relationship construction, reduce supervisors’ burdens, and create non-utilitarian dialogue space.

For Policy Makers:

- Reform the research evaluation system, implement classified evaluation, and introduce a “non-consensus” review dimension.

- Establish “high-risk, high-return” research special funds with “value of failure” as the evaluation criterion.

- Create a culture tolerant of failure and integrate error tolerance into educational policies.

For Researchers:

- Operationalize the four-dimensional framework into measurable indicator systems.
- Test the causal relationship between patience capital input and talent cultivation effectiveness.

- Expand the framework’s application to postgraduate education, vocational education, and other fields.

Knowledge of Research

This study’s academic contributions are reflected in three aspects:

(1) Conceptual innovation: Introducing and reconstructing patience capital as institutional capital governing resource allocation, filling the theoretical gap in talent development research.

(2) Tool innovation: Constructing a four-dimensional analytical framework of time, error tolerance, relationship, and culture, turning abstract concepts into observable dimensions and providing a tool for institutional examination.

(3) Application innovation: Examining the practical model of top talent cultivation in Chinese universities, revealing institutional dilemmas and reconstruction pathways, providing a theoretical perspective for understanding the Chinese context and a guidance plan for reform practice.



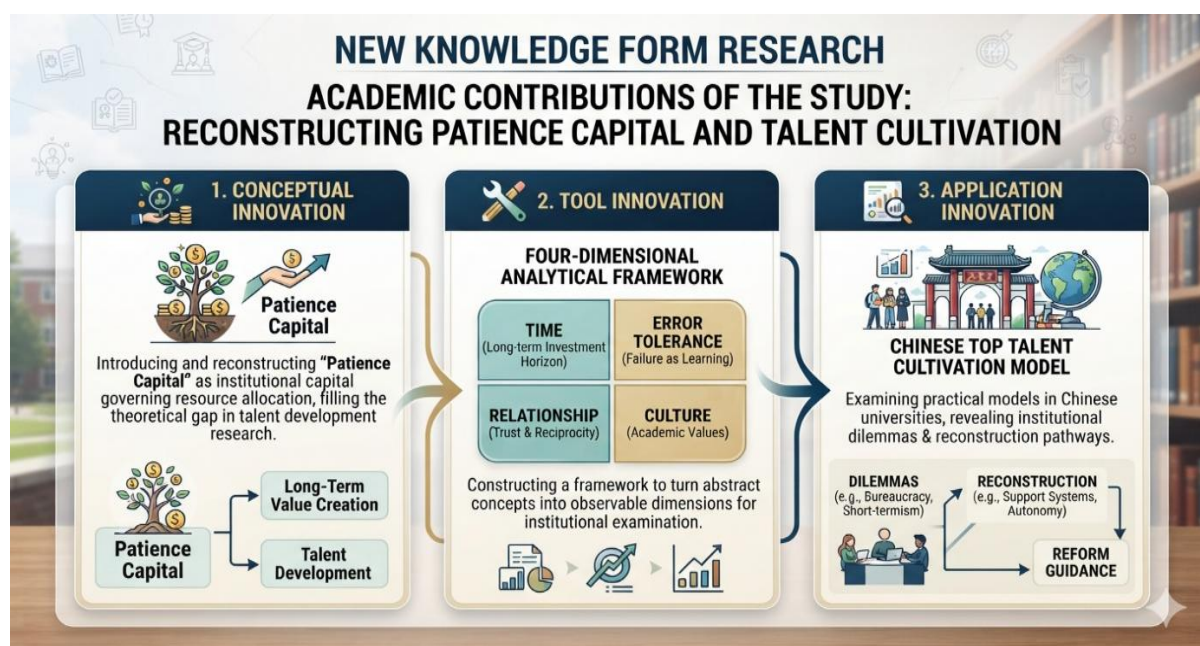


Figure 2 Show New Knowledge form Research

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