Existing Challenges and Optimization Strategies for Cultivating Innovative Talents in Engineering Universities under the Background of Building a Powerful Country in Education

Zeyang Huang[1], Zhongshu Fang[2,*], Qichun Wang[3], Zhongye Si[1]

[1] *Innovation and Entrepreneurship Education Center, East China University of Science and Technology, Shanghai, China*

[2]*Department of Chinese Language and Literature, East China Normal University, Shanghai, China*

[3] *Office of Organizational Structure and Staffing Committee, Pidu District Committee, Chengdu, Sichuan, China*

**Corresponding Author.*

Abstract: The construction of a powerful country in education poses an era requirement for engineering universities to cultivate top-notch talents with innovative spirits and practical abilities, professionals adaptable to national strategic needs and emerging field developments, composite talents with international competitiveness and global visions, and well-rounded builders and successors with comprehensive moral, intellectual, physical, aesthetic, and labor qualities. However, the cultivation of innovative talents in universities still faces existing challenges such as rigid teaching modes, lagging disciplinary settings, unitary evaluation systems, and weak faculty strength. To address these issues, optimization and enhancement can be achieved through five aspects: promoting the deep integration of moral and political education with innovative education, deepening the reform of teaching modes to enhance the practicality of innovative education, optimizing disciplinary settings to closely align with industrial needs and developments, constructing an integrated evaluation index system for student innovation capabilities, and strengthening the construction of the faculty to improve teachers' innovative qualities. This provides theoretical references and practical guidance for cultivating innovative talents in engineering universities.

Keywords: Education Powerhouse; Innovative Talents in Universities; Existing Challenges; Optimization Strategies

1. Introduction

Under the ambitious blueprint of building a powerful country in education, engineering universities, as the main front in cultivating innovative engineering and technological talents, bear the significant mission of driving technological progress and industrial upgrading. Nevertheless, current engineering universities still encounter numerous challenges in cultivating innovative talents. On the one hand, traditional educational modes struggle to adapt to the rapidly changing technological demands, resulting in a disconnect between curriculum systems and practical teaching, which leads to insufficient innovative abilities among students. On the other hand, issues such as an unreasonable faculty structure, a shortage of high-level innovative talents, weak industry-university-research cooperation, and imperfect evaluation mechanisms also constrain the cultivation of innovative talents. To tackle these challenges, engineering universities must actively explore new pathways for cultivating innovative talents, which is not only a necessity for their own development but also a requirement for achieving the goal of building a powerful country in education and promoting national technological progress and industrial upgrading.

2. The Era Requirements for Cultivating Innovative Talents in Engineering Universities under the Background of Building a Powerful Country in Education

2.1 Cultivating Top-Notch Talents with Innovative Spirits and Practical Abilities

"Innovation is the primary driving force leading development and the strategic support for building a modern economic system." [1] [2] This important assertion profoundly reveals the core position of innovation in national development. Under the strategic background of building a powerful country in education, engineering universities, as important bases for cultivating engineering and technological talents, shoulder the critical responsibility of nurturing top-notch talents with innovative spirits and practical abilities. This requirement not only reflects the country's urgent need for innovative talents but also represents the concrete practice of M's talent cultivation theory in the new era. In *Das Kapital*, [3] M profoundly elaborated on the dialectical relationship between productive forces and production relations, economic foundations, and superstructures, pointing out that the development of productive forces is the fundamental driving force for social progress. As an essential source of productive force development, innovation plays an irreplaceable role in promoting sustained and healthy economic and social development. Therefore, cultivating top-notch talents with innovative spirits and practical abilities is not only an inherent requirement for the development of engineering universities but also a strategic need for serving national economic and social development and realizing the Chinese Dream of national rejuvenation. The *Outline of the Plan for Building a Powerful Country in Education (2024-2035)* clearly states: "Explore new modes for cultivating national top-notch innovative talents in strategically urgent and emerging fields." "Establish an effective mechanism where technological innovation and talent cultivation mutually support and drive the high-quality development of disciplines." "By 2027, the quality of independently cultivated talents will be comprehensively improved, and top-notch innovative talents will continuously emerge. By 2035, a powerful country in education will be established." [4] This outline sets higher and more specific requirements for cultivating innovative talents in engineering universities. The cultivation of top-notch innovative talents necessitates that engineering universities focus on stimulating students' innovative potential and fostering their innovative thinking and practical abilities during the education and teaching process, enabling them to continuously explore the unknown and scale new heights in the field of engineering technology.

2.2 Cultivating Professionals Adaptable to National Strategic Needs and Emerging Field Developments

"The most fundamental aspect of implementing the innovation-driven development strategy is to enhance independent innovation capabilities, and the most urgent task is to break down institutional barriers and maximize the liberation and activation of the immense potential harbored in science and technology as the primary productive force." [5] This important discourse provides a fundamental guide for engineering universities to cultivate professionals adaptable to national strategic needs and emerging field developments. With the in-depth development of a new round of technological revolutions and industrial transformations, emerging fields are constantly emerging, leading to an increasingly urgent demand for professionals. As the main front in cultivating engineering and technological talents, engineering universities must closely revolve around national strategic needs and emerging field developments, adjust and optimize professional structures, and cultivate professionals that meet the requirements of the new era. This is not only the responsibility of engineering universities in serving national economic and social development but also the key to enhancing their competitiveness. In *The C M*, M stated: "The nature of big industry determines the transformation of labor, the change of functions, and the overall mobility of workers." [6] This assertion inspires us that with economic and social development and technological progress, the demand for professionals will also constantly change. Therefore, engineering universities must keep pace with the times, constantly adjust and optimize professional structures, and cultivate professionals adaptable to national strategic needs and emerging field developments. The *Outline of the Plan for Building a Powerful Country in Education (2024-2035)* proposes: "Establish a mechanism for adjusting disciplinary settings and talent cultivation modes driven by technological development and national strategic needs." "Implement

actions to cultivate excellent first-class disciplines, promote the integrated development of disciplines, make extraordinary arrangements for urgently needed disciplines and professions, and strengthen the construction of fundamental, emerging, and interdisciplinary disciplines." [4] This outline sets specific requirements for engineering universities to cultivate professionals adaptable to national strategic needs and emerging field developments. Engineering universities should actively respond to the national call, strengthen the construction of emerging and interdisciplinary disciplines, and cultivate professionals with interdisciplinary knowledge and comprehensive abilities to provide strong support for serving national strategic needs and emerging field developments.

2.3 Cultivating Composite Talents with International Competitiveness and Global Visions

"In the fierce international competition, only innovators can advance, only innovators can become strong, and only innovators can win." [7] This important assertion profoundly reveals the essence and laws of international competition. In the context of globalization, engineering universities must focus on cultivating composite talents with international competitiveness and global visions to cope with increasingly intense international competition and challenges. In *The C M* [8], M stated: "The bourgeoisie, by opening up the world market, has made the production and consumption of all countries worldwide." This assertion inspires us that in the context of globalization, exchanges in economic, technological, cultural, and other fields among countries are becoming increasingly frequent, leading to an increasingly urgent demand for composite talents with international competitiveness and global visions. As important bases for cultivating engineering and technological talents, engineering universities must pay attention to fostering students' international visions and cross-cultural communication abilities, enabling them to showcase their talents and strengths on the international stage. The *Outline of the Plan for Building a Powerful Country in Education (2024-2035)* proposes: "Improve the strategy for opening up education to the outside world and construct important educational centers with global influence." "Enhance the global talent cultivation and aggregation capabilities." [4] This outline sets clear requirements for engineering universities to cultivate composite talents with international competitiveness and global visions. Engineering universities should actively respond to the national call, strengthen exchanges and cooperation with internationally renowned universities and research institutions, introduce high-quality educational resources, promote the internationalization of education, focus on fostering students' international visions and cross-cultural communication abilities, and enable them to showcase their talents and strengths on the international stage.

2.4 Cultivating Well-Rounded Social Builders and Successors with Comprehensive Moral, Intellectual, Physical, Aesthetic, and Labor Qualities

"Cultivating well-rounded social builders and successors with comprehensive moral, intellectual, physical, aesthetic, and labor qualities is the fundamental task of educational work." [9] This important assertion provides clear direction and goals for cultivating innovative talents in engineering universities. In the process of cultivating innovative talents, engineering universities must pay attention to students' overall development and strive to cultivate well-rounded social builders and successors with comprehensive moral, intellectual, physical, aesthetic, and labor qualities. In *Das Kapital*, M profoundly elaborated on the theory of human overall development, pointing out that human overall development is an essential requirement of society. [10] As important bases for cultivating engineering and technological talents, engineering universities must pay attention to students' overall development and strive to cultivate their ideological and moral qualities, scientific and cultural qualities, physical and mental health qualities, artistic aesthetic qualities, and labor practice qualities. This is not only an inherent requirement for the development of engineering universities but also a strategic need for serving national economic and social development and realizing the Chinese Dream of national rejuvenation. The *Outline of the Plan for Building a Powerful Country in Education (2024-2035)* proposes: "Implement the

fundamental task of fostering virtue through education, cultivate talents for the Party and the country, comprehensively serve Chinese-style modernization construction, take root in Chinese soil to run education, accelerate the construction of a high-quality education system, and cultivate well-rounded social builders and successors with comprehensive moral, intellectual, physical, aesthetic, and labor qualities." [4] This outline sets clear requirements for engineering universities to cultivate well-rounded social builders and successors with comprehensive moral, intellectual, physical, aesthetic, and labor qualities. Engineering universities should actively respond to the national call, strengthen moral and political education, focus on cultivating students' sense of social responsibility and mission, emphasize the cultivation of their scientific and cultural qualities, physical and mental health qualities, artistic aesthetic qualities, and labor practice qualities, and strive to cultivate well-rounded social builders and successors with comprehensive moral, intellectual, physical, aesthetic, and labor qualities.

3. Existing Challenges for Cultivating Innovative Talents in Engineering Universities under the Background of Building a Powerful Country in Education

3.1 Rigid Teaching Modes: Emphasizing Theoretical Knowledge Transmission While Neglecting Practical Ability Cultivation

Currently, in the process of cultivating innovative talents, engineering universities in China generally face the issue of rigid teaching modes. [11] Many universities still adopt traditional teaching modes, emphasizing theoretical knowledge transmission while neglecting practical ability cultivation. This teaching mode not only struggles to stimulate students' innovative potential and practical abilities but also fails to adapt to the demands for innovative talents in the new era. Traditional teaching modes are teacher-centered, focusing on the indoctrination of theoretical knowledge and neglecting students' dominant position and practical ability cultivation. In engineering universities, this teaching mode leads to students passively receiving knowledge in class, lacking opportunities for active thinking and exploration, and finding it difficult to develop innovative thinking and practical abilities. Traditional teaching modes often emphasize the systematicness and completeness of knowledge while neglecting its applicability and innovativeness, making students feel helpless when facing practical problems. Many course contents are outdated, disconnected from the actual needs of enterprises, lacking frontiers and practicality, and failing to stimulate students' interest and motivation in learning. Some engineering courses still adhere to traditional theoretical lectures, lacking introductions and applications of new technologies and processes, leading to students' difficulties in adapting to the rapidly developing field of engineering technology after graduation. Practical teaching is a crucial link in cultivating students' practical abilities. However, in current engineering universities, practical teaching is often neglected or weakened. On the one hand, insufficient investment in practical teaching resources, such as outdated laboratory equipment and limited experimental venues, restricts the development of practical teaching. On the other hand, practical teaching content and methods are monotonous, lacking innovativeness and challenges, and failing to achieve the goal of cultivating students' practical abilities. Some engineering courses' experimental sessions still focus on verification experiments, lacking design, comprehensive, and innovative experimental projects, leading to students' lack of opportunities for active thinking and exploration during experiments. Many engineering courses' theoretical teaching and practical teaching are independent of each other, lacking effective cohesion and integration, making it difficult for students to receive practical support during theoretical learning and theoretical guidance during practical learning, thereby failing to form a complete knowledge system and ability structure.

3.2 Lagging Disciplinary Settings: Existing Disciplines and Professions Difficult to Serve National Industry Development

With the in-depth development of a new round of technological revolutions and industrial transformations, the demand for professionals in national industries is constantly changing.

However, engineering universities in China generally face the issue of lagging disciplinary settings. [12] Many universities' disciplines and professions fail to serve national industry development needs, leading to a disconnect between talent cultivation and market demands. Many universities are overly conservative and lagging in disciplinary settings, lacking forward-looking and innovative perspectives. Some universities still adopt traditional disciplinary setting modes without adjusting and optimizing them based on market demands and industry development trends. Simultaneously, some universities lack the construction and development of interdisciplinary and cross-disciplinary disciplines, leading to insufficient breadth and depth in talent cultivation. Engineering universities' disciplinary and professional structures often overly focus on traditional engineering fields such as machinery, electronics, and civil engineering while neglecting the development of emerging fields such as artificial intelligence [13], big data, and new energy. This structural irrationality leads to obvious shortcomings in universities' cultivation of new engineering and technological talents, unable to meet the country's rapid development needs in emerging industrial fields. With the rapid development of technology and the continuous optimization and upgrading of industrial structures, enterprises' demands for engineering and technological talents are also constantly changing. However, engineering universities' disciplinary settings and teaching contents often fail to keep up with these changes in a timely manner, leading to significant gaps in knowledge structures and skill levels between cultivated talents and enterprises' actual demands. This disconnect not only affects students' employability but also constrains national industries' innovative development. Contemporary scientific development and technological breakthroughs increasingly rely on the intersection and fusion of different disciplines. Engineering universities often have insufficient interdisciplinary setting and development, lacking cross-disciplinary teaching and research platforms, making it difficult to cultivate composite talents with multidisciplinary knowledge backgrounds and innovative abilities. Fundamental disciplines are the cornerstone of engineering and technological development, playing an important role in cultivating innovative engineering and technological talents. Currently, engineering universities' disciplinary settings often overly focus on applied disciplines while neglecting the construction and development of fundamental disciplines. This tendency leads to students' insufficiencies in fundamental theories and knowledge systems, making it difficult for them to achieve deep-level innovations and breakthroughs in the field of engineering technology. Therefore, universities must adjust and optimize disciplinary and professional structures based on market demands and industry development trends to cultivate professionals meeting the requirements of the new era.

3.3 Unitary Evaluation Systems: Overemphasizing Examination Scores While Neglecting Innovative Ability Evaluation

Currently, in the process of cultivating innovative talents, engineering universities in China generally face the issue of unitary evaluation systems. Many universities still overly emphasize examination scores while neglecting innovative ability evaluation, leading to difficulties in effectively guaranteeing talent cultivation quality. In current engineering universities' evaluation systems, examination scores are often regarded as the sole standard for measuring students' learning outcomes. Whether it is course assessment, scholarship evaluation, or postgraduate recommendation qualification determination, examination scores occupy an absolutely dominant position. This unitary evaluation method leads to both students and teachers overly focusing on knowledge point memorization and exam-taking skill training while neglecting the cultivation of students' innovative thinking and practical abilities. This evaluation system not only fails to comprehensively reflect students' overall qualities and ability levels but also easily leads to students' exam-oriented psychology and utilitarianism tendencies. Corresponding to the overemphasis on examination scores is the obvious lack of evaluation of students' innovative abilities in engineering universities. [14] Although some universities have added experimental and practical sessions to their

curricula, they often fail to give them sufficient attention in their evaluation systems. For example, experimental reports and course design outcomes occupy a low proportion in final grades, or they are simply judged as "qualified" or "unqualified," unable to comprehensively reflect students' innovative abilities and practical levels. Besides examination scores and simple practical outcome evaluations, engineering universities' evaluation systems lack diversity and flexibility. Evaluation systems among different disciplines and professions often lack targetedness, failing to fully reflect the characteristics and needs of their respective fields. For students with innovative potential and special talents, existing evaluation systems often fail to give sufficient recognition and encouragement, leading to the dampening of these students' innovative enthusiasm. In evaluation systems, the feedback mechanism for evaluation results is also a crucial link. However, current engineering universities face lags and insufficiencies in evaluating result feedback. Students often only learn about their examination scores through transcripts at the end of semesters or academic years but lack timely and specific feedback on their performance in practice and innovation. This lack of feedback mechanisms makes it difficult for students to understand their strengths and weaknesses and adjust their learning directions and methods in a timely manner.

3.4 Weak Faculty Strength: Lack of Experience in Cultivating Innovative Talents Among Some Teachers

The quality and ability of teachers are critical factors affecting the quality of talent cultivation. In the context of building an education power, engineering universities shoulder the important mission of cultivating innovative engineering and technological talents. However, currently, engineering universities generally face the issue of weak faculty strength, especially among some teachers who lack experience in cultivating innovative talents. This significantly hampers the quality of cultivating innovative talents. Some teachers still adhere to traditional teaching philosophies, focusing too much on imparting knowledge and training exam-taking skills while neglecting the cultivation of students' innovative thinking and practical abilities. They lack attention to individual differences among students and fail to teach students according to their characteristics and needs, resulting in students lacking effective guidance and support in cultivating their innovative abilities. With the rapid development of technology and the continuous optimization and upgrading of industrial structures, interdisciplinary integration has become an important trend in cultivating innovative engineering and technological talents. Some teachers, due to the limitations of their own knowledge structures, lack interdisciplinary teaching abilities and struggle to organically integrate knowledge and methods from different disciplines into teaching, thereby restricting the expansion of students' innovative thinking and the cultivation of their innovative abilities. Practical teaching is an important aspect of cultivating students' innovative and practical abilities. Some teachers have long lacked close ties with enterprises and practical experience, making it difficult to combine theoretical knowledge with practical applications, and resulting in their inability to provide effective guidance and support in practical teaching. Some teachers lack innovation in teaching methods and means, still adopting traditional lecture-style teaching, which lacks interactivity and inspiration. This monotonous teaching method is difficult to stimulate students' learning interest and initiative, and cannot meet students' needs in cultivating innovative thinking and practical abilities. Meanwhile, some young teachers in universities lack teaching experience and research capabilities, making it difficult for them to competently undertake the task of cultivating innovative talents. Some middle-aged and older teachers also lack the ability to apply modern teaching technologies and tools, such as multimedia and online teaching, thereby limiting the improvement of teaching effectiveness.

4. Optimization Strategies for Cultivating Innovative Talents in Engineering Universities under the Background of Building an Education Power

4.1 Value Leadership: Promoting the Deep Integration of Moral and Political Education with Innovative Education

In the process of cultivating innovative talents,

engineering universities should focus on the deep integration of moral and political education with innovative education. Through moral and political education, students are guided to establish correct worldviews, outlooks on life, and values, cultivating their social responsibility and missions. Through innovative education, students' innovative potential and practical abilities are stimulated, and their innovative thinking and entrepreneurial spirit are cultivated. Firstly, engineering universities should strengthen the construction of moral and political education courses, by offering ideological and political courses, holding ideological and political lectures, and other means, to guide students to deeply study M theory and the theoretical system of Chinese characteristics, establishing correct worldviews, outlooks on life, and values [15]. Integrate ideological and political elements into professional course teaching to achieve an organic combination of moral and political education with professional education. Secondly, engineering universities should focus on cultivating students' social responsibility and missions, by organizing students to participate in social practices, volunteer services, and other activities, allowing students to deeply understand social realities and national conditions, enhancing their social responsibility and missions, cultivating their teamwork spirit and collective sense of honor, and allowing students to learn collaboration and sharing in collective activities. Finally, engineering universities should strengthen the organic integration of innovative education with practical teaching, by offering innovative courses, holding innovation competitions, and other means, to stimulate students' innovative potential and practical abilities, incorporating innovative elements into practical teaching, allowing students to exercise their innovative thinking and entrepreneurial spirit in practice. Students can be organized to participate in scientific research projects, internships, and other activities, allowing students to learn new knowledge, master new skills, and accumulate new experiences in practice.

4.2 Innovation Drive: Deepening the Reform of Teaching Modes to Enhance the Practicality of Innovative Education

By reforming traditional teaching modes, innovating teaching methods and means, and other methods, students' learning interest and innovative potential are stimulated, and their innovative thinking and practical abilities are cultivated [16]. Firstly, engineering universities should reform traditional teaching modes, abandoning the traditional spoon-feeding teaching mode, and adopting new teaching modes such as heuristic and inquiry-based learning. By guiding students to actively think and explore independently, their learning interest and innovative potential are stimulated, their critical thinking and problem-solving abilities are cultivated, allowing students to learn to innovate through thinking and exercise practical abilities through solving problems. Secondly, engineering universities should innovate teaching methods and means, fully utilizing modern information technology means such as multimedia, online courses, and virtual simulation experiments, enriching teaching methods and content. By presenting abstract and difficult-to-understand knowledge points through intuitive and vivid teaching methods, students' learning interest and effectiveness are improved, cultivating their autonomous learning abilities and team collaboration abilities, allowing students to master new knowledge in autonomous learning and exercise practical abilities in team collaboration. Finally, engineering universities should strengthen the construction of practical teaching links, by strengthening laboratory construction, improving the practical teaching system, and other means, to provide students with more practical opportunities and platforms. Combining theoretical knowledge with practical teaching, students are allowed to consolidate what they have learned, master new skills, and accumulate new experiences in practice. Students can be organized to participate in scientific research projects, internships, and other activities, allowing students to exercise their innovative thinking and entrepreneurial spirit in practice.

4.3 Industry-Education Integration: Optimizing Discipline Settings to Closely Align with Industry Demands and Development

In the process of cultivating innovative talents, engineering universities should focus on industry-education integration, optimizing discipline settings to closely align with

industry demands and development. By strengthening cooperation and exchanges with enterprises, research institutes, and other units, the deep integration of industry, academia, and research is promoted, providing strong support for cultivating innovative talents. Firstly, engineering universities should strengthen cooperation and exchanges with enterprises, research institutes, and other units. By establishing industry-academia-research cooperation bases, joint laboratories, and other means, cooperation and exchanges with enterprises and research institutes are strengthened. Through jointly conducting scientific research projects, technological breakthroughs, and other activities, the deep integration of industry, academia, and research is promoted. Actual needs and technical challenges of enterprises are introduced into teaching and research, providing students with more practical opportunities and platforms. Secondly, engineering universities should optimize discipline settings to closely align with industry demands and development. Based on market demands and industry development trends, discipline and major structures are adjusted and optimized to cultivate professionals who meet the requirements of the new era. Emphasis is placed on the construction and development of interdisciplinary and cross-disciplinary fields, promoting interdisciplinary integration and innovative development. The integration and development of engineering disciplines with sciences, management, humanities, and social sciences can be strengthened to cultivate interdisciplinary and comprehensively able talents with cross-disciplinary knowledge and abilities [17]. Finally, engineering universities should focus on cultivating students' practical abilities and innovative spirits. By strengthening the construction of practical teaching links, improving the practical teaching system, and other means, students are provided with more practical opportunities and platforms. Emphasis is placed on combining theoretical knowledge with practical teaching, allowing students to consolidate what they have learned, master new skills, and accumulate new experiences in practice. Students are encouraged to actively participate in various innovation competitions and scientific research activities to exercise their innovative thinking and entrepreneurial spirit.

4.4 System Construction: Building an Integrated Evaluation System for Students' Innovative Abilities

In the process of cultivating innovative talents, engineering universities should focus on building an integrated evaluation system for students' innovative abilities [18]. By constructing a scientific and reasonable evaluation system, students' innovative abilities and comprehensive quality levels are comprehensively and objectively evaluated, providing strong support for cultivating innovative talents. Firstly, engineering universities should construct a scientific and reasonable evaluation system. Based on the goals and requirements of cultivating innovative talents, combined with discipline characteristics and professional features, a scientific and reasonable evaluation system is constructed, including aspects such as innovative ability, practical ability, team collaboration ability, and social responsibility, with corresponding weights and scores assigned, comprehensively and objectively evaluating students' innovative abilities and comprehensive quality levels. Secondly, engineering universities should focus on the scientificity and fairness of the evaluation process, adopting a combination of multiple evaluation methods and means for comprehensive and objective evaluation. Peer review, expert review, student self-assessment and peer assessment, and other methods can be used for evaluation. Emphasis is placed on the transparency and openness of the evaluation process to ensure the fairness and credibility of the evaluation results. Finally, engineering universities should focus on the feedback and application of evaluation results. Evaluation results are timely fed back to students and teachers, helping students understand their strengths and weaknesses and providing targeted guidance and suggestions for subsequent teaching and research. Evaluation results are used as important basis for scholarship assessments, postgraduate recommendation qualifications, etc., incentivizing students to actively participate in innovation activities and practical training activities.

4.5 Capacity Building: Strengthening the Faculty and Enhancing Teachers'

Innovative Competence

In the process of cultivating innovative talents, engineering universities should prioritize strengthening the faculty and enhancing teachers' innovative competence. By introducing and nurturing high-quality teachers, and intensifying teacher training and learning exchanges [19], the universities can elevate teachers' innovative competence and teaching abilities, thereby providing robust support for the cultivation of innovative talents. Firstly, engineering universities should introduce and nurture high-quality teachers. This can be achieved by recruiting outstanding young scholars and attracting overseas high-level talents to join the teaching and research teams [20]. Attention should also be paid to fostering the innovative competence and teaching abilities of current teachers through participation in domestic and international academic conferences, advanced studies, and other means to improve their academic standards and teaching capabilities. Secondly, engineering universities should strengthen teacher training and learning exchanges. Regularly organizing teachers to participate in various training and learning exchange activities can help them stay abreast of the latest teaching philosophies and methodologies, grasp the latest research achievements and technological trends, and encourage them to actively engage in various research projects and technological breakthrough activities to hone their innovative thinking and practical abilities. Lastly, engineering universities should establish incentive mechanisms to stimulate teachers' enthusiasm and creativity. By setting up research project reward funds, teaching achievement reward funds, innovative course reward funds, and other incentives, teachers can be motivated to actively participate in teaching and research activities. Emphasis should be placed on creating a favorable teaching and research atmosphere and environment, providing teachers with more development opportunities and space. These measures can effectively enhance teachers' innovative competence and teaching abilities, providing robust support for the cultivation of innovative talents.

5. Conclusion

In the context of building a powerful country in education, engineering universities face numerous challenges and opportunities in cultivating innovative talents. By deeply integrating moral and political education with innovative education, deepening the reform of teaching modes to enhance the practicality of innovative education, optimizing discipline settings to closely align with industrial needs and development, constructing an integrated evaluation system for students' innovative abilities, and strengthening the faculty to enhance teachers' innovative competence, engineering universities can achieve value guidance, innovation drive, industry-education integration, system construction, and capacity building. These efforts will effectively improve the quality of innovative talent cultivation and enhance the ability to serve national economic and social development. In the future, with the in-depth implementation of the strategy to build a powerful country in education and the continuous progress of economic and social development, the cultivation of innovative talents in engineering universities will usher in broader development prospects and more arduous historical missions.

Acknowledgments

This paper is supported by The Higher Education Scientific Research Planning Project of the China Association of Higher Education: "Research on the Practical Paths of Promoting Cultural Education in Universities Guided by Xi's Thought on Culture" (Project Number: 24XC0409),The Shanghai Educational Science Research Project: "Research on the Implementation Paths of President Xi's Important Exposition on Self-Reliance in Science and Technology in Universities" (Project Number: C2024179),The Shanghai Educational Science Research Project: "Research on Ideological Risk Governance in Universities in the Digital Era" (Project Number: C2025121),The Party Building Research Project of East China Normal University: "Research on the Realization Mechanism of Promoting the Whole Process of Teacher Ethics and Style Construction in Universities with High-Quality Party Building" (Project Number: DJYB202406).

References

[1] Securing a Decisive Victory in Building a Moderately Prosperous Society in All Respects and Striving for the Great

Success of Chinese Characteristics for a New Era - Report to the 19th National Congress of Chinese political parties. Party Building, 2017, (11): 15-34.
[2] On Self-Reliance in Science and Technology. Beijing: Central Literature Publishing House, 2023.
[3] K. Capital. Beijing: People's Publishing House, 2018.
[4] The Central Committee of Chinese political parties and the State Council. "Outline of the Plan for Building an Education Power (2024-2035)", January 19, 2025. https://www.gov.cn/zhengce/202501/content_6999913.htm
[5] Speech at the 17th General Assembly of the Chinese Academy of Sciences and the 12th General Assembly of the Chinese Academy of Engineering. People's Daily, June 10, 2014 (002).
[6] M and E Collected Works. Beijing: People's Publishing House, 2021.
[7] Speech at the Celebration of the 100th Anniversary of the Establishment of the China Association for International Exchange of Personnel. United Front Work in China, 2013, (11): 4-7.
[8] The C M. Beijing: People's Publishing House, 2018.
[9] Vigorously Promote the Great Patriotic Spirit and Continuously Push Forward the Great Cause of Building a Powerful Country and Rejuvenating the Nation. Qiushi, 2024 (19): 4-16.
[10] M, K. Capital. Beijing: People's Publishing House, 2018.
[11] Wang Hongcai & Sun Jiapeng. Realistic Challenges and Coping Strategies for Cultivating Top-notch Innovative Talents in the Context of Building an Education Power. Modern Educational Management, 2024, (12): 1-10.
[12] Guo Guoxiang & Zhang Haishui. Optimizing the Setup of University Disciplines and Majors to Adapt to the Development of New-quality Productive Forces. Journal of National Academy of Education Administration, 2024, (08): 34-42.
[13] Zheng Qinghua. AI Empowering the Innovative Development of STEM Education: Understanding and Practice. China Higher Education Research, 2025, (01): 1-7. DOI: 10.16298/j.cnki.1004-3667.2025.01.01.
[14] Pan Gang, Shi Linchao, Jiang Zhenli, et al. Construction of an Innovative Ability Training Model for Engineering Students - A Case Study of the Safety Engineering Major. University Education, 2024, (11): 125-128+148.
[15] Zhao Fengying & Xu Hui. The Experience and Inspiration of Singapore's Early Selection and Cultivation of Top-notch Innovative Talents. Journal of Comparative Education, 1-16 [2025-01-23].
[16] Li Yan & Chen Zhuo. Cultivating Top-notch Innovative Graduate Talents in the United States: History, Paths, and Orientations - An Analysis Based on the "Endless Frontier Act". Higher Engineering Education Research, 2024, (06): 170-177.
[17] Li Gang, Zheng Zelin, & Zhang Jiawei. How Universities Cultivate Top-notch Innovative Talents - Based on Content Analysis of Interviews with 100 Academicians. Chongqing Higher Education Research, 1-13 [2025-01-23].
[18] Shen Guochang & He Pengli. The Endogenous Logic, Specifications, and Important Paths for Cultivating Top-notch Innovative Talents from the Perspective of New-quality Productive Forces. Journal of Beijing Normal University (Social Sciences Edition), 2025, (01): 31-37.
[19] Xiang Juhu & Huang Yiqing. The Logic, Dilemmas, and Paths of Promoting Top-notch Innovative Talent Cultivation through the Modern University College System. Higher Education Development and Evaluation, 2025, 41(01): 53-63+131.
[20] Zhang Peiran, Li Hongyao, & Li Guang. Core Traits, Growth Laws, and Cultivation Strategies of Young Top-notch Innovative Talents in Universities. Journal of South China Normal University (Social Sciences Edition), 2024, (05): 44-56+207.

