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Pathways for Research and Education in Engineering: A Case Study of Zunyi Normal University

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Abstract: Under the "Three-Aspect Education" framework, the significance of research-oriented education in engineering disciplines has become increasingly prominent. Given that Guizhou's local universities' engineering programs primarily enroll students from within the province and focus on supporting regional economic development, their research-driven educational approach holds particular importance. These institutions should systematically analyze historical experiences, refine pedagogical strategies, enhance scientific research training for students, optimize top-level planning for research education, establish multidimensional research platforms, and create technology commercialization and demonstration platforms aligned with local needs. This comprehensive approach will cultivate a new generation of engineering professionals who excel in both ideological commitment and technical expertise, ultimately contributing to China's modernization drive.

Keywords: Guizhou; local universities; engineering majors; scientific research education; path

1 INTRODUCTION

In the new era of socialism, to comprehensively enhance the quality of ideological and political education, it is imperative to establish a comprehensive "Grand Ideological Education" framework. This represents both an urgent requirement for universities to address evolving challenges and fulfill their fundamental mission of "cultivating virtue through education" [1]. In February 2017, the Central Committee of the Communist Party of China and the State Council proposed establishing a long-term mechanism for "Three-Aspect Education" in their document "Guidelines on Strengthening and Improving Ideological and Political Work in Higher Education Institutions Under New Circumstances" [2]. Subsequently, in December 2017, the Party Leadership Group of the Ministry of Education issued the "Implementation Outline for Enhancing the Quality of Ideological and Political Education in Higher Education Institutions," proposing the construction of a "Ten-Aspect Education System" [3]. Within this framework of "Grand Ideological Education," "Three-Aspect Education," and "Ten-Aspect Education System," "Research-Oriented Education" has been endowed with renewed significance and vital contemporary relevance [4].

As part of the "Ten Major Education Systems", research-oriented education transcends traditional teaching models that separate instruction from research and focus solely on knowledge transmission [5]. Instead, it requires establishing a collaborative educational framework where students not only acquire scientific knowledge and skills but also internalize political values, ethical principles, scientific rigor, and patriotic spirit through research experiences – all of which subtly shape their personal growth and professional development [6]. This approach embodies the collaborative educational vision of "enhancing teaching through research and promoting education via research" [7]. Particularly for engineering disciplines renowned for their research capabilities, exploring optimized pathways for research-driven education under the guidance of comprehensive ideological education concepts and craftsmanship spirit cultivation represents an essential strategy to elevate the quality and effectiveness of engineering education in regional universities [8]. This initiative holds significant theoretical and practical value for improving talent development outcomes [9] and holds broader implications for higher education reform in similar contexts [10].

2 CHARACTERISTICS OF ENGINEERING EDUCATION MODE IN LOCAL UNIVERSITIES IN GUIZHOU

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The term "local universities" in this context refers to provincial-level undergraduate institutions under municipal (prefecture-level) jurisdiction. Geographically, these universities are situated within their respective regions. Administratively, they typically operate under local administrative oversight and development plans. Their funding primarily originates from regional fiscal allocations and economic growth patterns, with student enrollment predominantly consisting of local candidates. The talent cultivation programs at these institutions are fundamentally designed to serve the economic development needs of their host regions.

2.1 The Development Foundation of Local Colleges and Universities is Weak, and the Orientation of Engineering Development is Unclear

Historically, the nine regional universities in Guizhou Province were formed through mergers of local secondary vocational schools, teacher training colleges, and education institutes (as shown in Table 1), with student populations ranging from 9,000 to 15,000. Post-merger challenges included weak academic foundations and limited faculty development opportunities. From their peak consolidation period between 2000 and 2009 to the current stable phase, these institutions have transitioned toward comprehensive university models, giving rise to engineering programs. However, all merged regional universities in Guizhou originated as teacher training colleges. Within this predominantly teacher-focused system, engineering programs remain underdeveloped with ambiguous positioning and distinct characteristics, often lagging behind traditional teacher education disciplines in resource allocation.

Table 1: Statistics of development status of 9 local colleges and universities in Guizhou

No.	school name	Date of promotion	Main schools prior to merger	location	School size (person)
1	Qiannan National Teachers College	2000	Qian Nan National Teachers College	Duyun City	13000
2	Zunyi Normal University	2001	Zunyi Normal College, Zunyi Institute of Education, Guizhou Nanbai Normal School	Zunyi City	15000
3	Guiyang College	2004	Guiyang Normal College, Jinzhu University, Guiyang Normal School	Guiyang City	12000
4	Binzhou Engineering and Applied Technology College	2005	Bijie Teachers College, Bijie Institute of Education	Bijie City	12000
5	Tongren College	2006	Tongren Teachers College	Tongren City	9000
6	Kerry College	2006	Qiandongnan National Teachers College	Kaili	12000
7	Liupanshui Normal University	2009	Liupanshui Naval College	Liupanshui City	10000
8	Xingyi National Teachers College	2009	Guizhou Southwest National Teachers College, Xingyi Normal School, Anlong National Normal School	Xingyi City	12000
9	Anshun College	2006	Anshun Teachers College	Anshun City	12000

2.2 Local Universities are Managed and Built by Local Governments, and Their Development is Subject to the Development of Local Social Economy

First, the core operational elements of local universities are primarily controlled by regional governments, including the allocation of educational funding and the staffing arrangements for administrative personnel. Second, their development is influenced by local cultural characteristics, geographical resources, economic conditions, and regional development

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levels. Consequently, the operational factors of Guizhou's local universities are shaped not only by the province's socioeconomic development status but also by municipal and prefectural-level governments' policy frameworks. For instance, in terms of fiscal investment, the Guizhou provincial government allocates significantly less funding to local universities compared to neighboring provinces.

2.3 The Students Of Local Universities Mainly Come From The Cities And States Of Their Own Province, And The Quality Of Students Is Not High

Regarding student origins at local universities, over 80% of students come from prefectures across the region, particularly from local cities and prefectures. Taking Zunyi Normal University's College of Engineering as an example: from 2020 to 2022, out-of-province students accounted for 6.04%,6.67%, and 6.92% respectively, failing to reach the 7% threshold in recent three years (see Table 2). In contrast, in-province students consistently exceeded 93%. Within the province, Zunyi Normal University's engineering students were predominantly from various prefectures during 2020-2022. The composition showed Zunyi City as the largest source at 27.5%, followed by Bijie City at 25.09%, while Guiyang City (including six districts, three counties, and one county-level city) contributed only 6.88% (see Table 3).

Table 2: Statistics Of In-Province And Out-Of-Province Students In The School Of Engineering, Zunyi Normal University From 2020 To 2022

time	overall number of people	Number of students from outside the province	proportion	Number of students from the province	proportion
2020	298	18	6.04%	280	93.96%
2021	300	20	6.67%	280	93.33%
2022	289	20	6.92%	269	93.08%

Table 3: Statistics Of Student Population In Zunyi Normal University College Of Engineering From 2020 To 2022 By State

area	Number of students from the province	Zunyi City	Tongren City	Qianxinan Prefecture	Qiannan Prefecture	Qiandongnan Prefecture	Liupanshui	Guiyang City	Bijie City	Anshun City
2020	280	72	19	24	10	18	15	21	88	13
2021	280	84	16	25	15	15	37	20	59	9
2022	269	72	31	19	7	26	24	16	61	13
amount to	829	228	66	68	32	59	76	57	208	35
Average share		27.50%	7.96%	8.20%	3.86%	7.12%	9.17%	6.88%	25.09%	4.22%

In terms of the quality of students, the admission score is about 50-70 points higher than the second undergraduate line, which is far from provincial universities.

2.4 Local Universities Mainly Serve For The Social And Economic Development Of Local Regions

First, local universities primarily serve regional needs by cultivating applied talents and providing scientific research support for local socioeconomic development. Therefore, these institutions must align their growth with regional economic

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progress, leveraging local cultural characteristics, natural endowments, and economic features to develop distinctive educational styles. This dual approach ensures they not only benefit the community but also achieve sustainable development. Second, municipal governments should enhance resource allocation to meet talent demands and provide research facilities, thereby forming a self-sustaining cycle. Local authorities must prioritize institutional development through economic incentives and policy support, transforming universities into key drivers of technological innovation and talent pipelines for regional economic advancement. Only through this integrated approach can local communities achieve sustained socio-economic growth.

3 Practice Of Scientific Research And Education In Engineering Majors Of Local Universities In Guizhou

3.1 The Importance And Necessity Of Scientific Research Education In Engineering Majors In Local Universities

Research-oriented education encompasses the entire process of cultivating students through scientific research processes, methodologies, and outcomes, which is an essential component of engineering education objectives. Generally speaking, the training goal for undergraduate engineering students is to develop them into senior technical professionals with solid theoretical knowledge in engineering, essential interdisciplinary expertise and skills, proficient engineering application capabilities, and innovative thinking. This approach emphasizes the dual importance of both engineering knowledge and practical application skills.

For China's top-tier universities—provincial key universities, 211 institutions, and 985 Project universities—their strategic positioning aligns with their talent development platforms. However, for engineering colleges in Guizhou Province, the focus of cultivating engineering students leans more toward practical application of foundational technologies. This stems from two key factors: First, these regional engineering institutions directly serve local socioeconomic development needs, which inherently prioritizes applied skills over theoretical knowledge. Second, given the relatively weaker academic foundation of their student body, it proves challenging to emphasize "solid theoretical knowledge and its applications" in theory. Instead, they must concentrate on equipping students with "fundamental theoretical mastery," thus concentrating on basic skill implementation. These dual considerations dictate that regional engineering education should prioritize technical application capabilities. The most effective way to enhance students' practical competencies lies in increasing participation in research practices. By engaging directly in local economic services and scientific research, students can improve their engineering practice skills, apply foundational knowledge, develop innovation and entrepreneurship abilities, and cultivate a craftsman spirit. This approach leverages the educational value of research, laying a solid foundation for future professional internships and career development.

3.2 Research On Students' Scientific Research Enthusiasm In School Of Engineering, Zunyi Normal University

A survey of 267 students across four engineering disciplines at the School of Engineering — Civil Engineering, Electrical Engineering, Mechanical Manufacturing and Automation, and Engineering Cost Estimation — reveals a gender distribution pattern: 207 male students (77.53%) and 60 female students (22.47%), aligning with the school's established gender ratio. The academic year distribution shows 16.1% freshmen, 18.35% sophomores, 35.96% juniors, and 29.59% seniors, reflecting a balanced grade structure.

3.2.1 Engineering Students Have High Willingness To Conduct Research

In the survey of "research intention during school", 52.81% of students are "very willing", 40.07% are "willing", 7.51% have not thought about it, and only 0.37% are "unwilling", indicating that the original intention of engineering students to research is relatively high, reaching 92.88%.

3.2.2 The Main Motivation Of Scientific Research Is To Improve Professional Practice Ability And Scientific Research Ability

When analyzing the primary motivations for scientific research, eight key factors were identified: enhancing professional practice opportunities (79.78%), improving research capabilities (71.16%), preparing for postgraduate studies (36.33%), accumulating academic connections (31.46%), laying foundation for graduation thesis (29.96%), and boosting career competitiveness (29.96%). The top five choices ranked as "enhancing professional practice opportunities" (79.78%), followed by "improving research skills" (71.16%), "preparing for postgraduate studies" (36.33%), and "laying foundation for graduation thesis" (31.46%). This reveals that engineering students' research motivations primarily focus on "strengthening practical experience" and "upgrading research competencies", indicating a trend toward non-utilitarian motivations in their academic pursuits.

3.2.3 In Terms Of Research Participation, They Tend To Participate In Teachers' Research Projects

In a survey on how engineering students participate in research projects, 67.04% chose to join faculty-led research initiatives, 15.36% opted for peer-initiated projects, while only 8.99% took the initiative to lead their own research proposals. This reveals that engineering students generally lack autonomy in conducting independent research, primarily seeking to enhance their capabilities through participation in faculty-led projects, yet demonstrating limited confidence in initiating and leading their own research endeavors.

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3.2.4 *The Research Approaches Favored By Engineering Students Are Diverse*

The survey on preferred research approaches among engineering students shows that in the five options available, 63.3% chose research projects and topic studies, 62.17% selected science and technology competitions, 58.43% opted for innovation and entrepreneurship, 41.95% focused on technological inventions and patents, while 20.97% focused on publishing academic papers. These findings indicate that engineering students demonstrate diverse preferences in choosing research pathways.

3.3 *Practice And Achievements Of The School Of Engineering Of Zunyi Normal University In Scientific Research Education*

The School of Engineering at Zunyi Normal University, a fully engineering-focused institution, offers four core programs: Civil Engineering, Engineering Cost Estimation, Electrical Engineering and Automation, and Mechanical Manufacturing and Automation. Through years of practical experience, the school has recognized the importance of integrating research-based education into engineering disciplines and conducted multifaceted explorations, with initial success in this approach. In 2022, for instance, students from the school won 8 national awards (1st, 2nd, and 3rd prizes) and 14 provincial-level honors in academic competitions. Over the past three years, the school has secured a significant proportion of national and provincial-level projects under the National College Students Innovation and Entrepreneurship Training Competition, with annual growth exceeding 10%. Data shows the school's share of national-level projects increased from 21.43% in 2020 to 35.29% in 2021 (up 13.86%), then rose further to 46.43% in 2022 (up 11.14%). Notably, the school now accounts for nearly half of all national-level project approvals across the entire university.

Table 4: Statistics Of National Approval Of Innovation And Entrepreneurship Training Programs, College Students Of Zunyi Normal University From 2021 To 2022

time	School-wide project initiation	Establishment of engineering school	Percentage of projects approved by the engineering school
2020	14	3	21.43%
2021	17	6	35.29%
2022	28	13	46.43%

The number of provincial-level approved projects for the 2020-2022 College Students Innovation and Entrepreneurship Training Program surged from 9 in 2020 to 29 in 2022, with the university's participation rate rising from 21.43% to 40.28%. Student engagement in academic competitions and innovation programs at school, provincial, and national levels increased from 69 to 357 participants, while over 30% of students participated in research activities.

Table 5: Statistics Of Provincial Approval Of Innovation And Entrepreneurship Training Plan, College Students Of Zunyi Normal University From 2020 To 2022

time	School-wide project initiation	Establishment of engineering school	Percentage of projects approved by the engineering school
2020	25	9	21.43%
2021	49	12	24.49%
2022	72	29	40.28%

An important reason for the achievements of scientific research education in the school of Engineering is that the school has established a mode of education and research studio + students, and a mode of party building integrated with scientific research education, which to some extent solves the problem of "separation of scientific research and education".

Guided by the "Outcomes-Based Education (OBE)" model, the School of Engineering directs its studios to leverage student competitions in professional disciplines and innovation-entrepreneurship training programs. This approach integrates the cultivation and enhancement of students' engineering application skills into faculty research projects and local enterprise engineering initiatives. Grounded in the characteristics of engineering talent development, the school continuously expands pathways for research-driven education.

Secondly, the School of Engineering actively explores a Party-building model that integrates scientific research with education. By establishing Party groups within research studios, it fully leverages the exemplary role of Party members to inspire enthusiasm among student Party members, probationary members, and aspiring Party members in scientific research practices. Through various professional competitions, this approach not only enhances students' research capabilities but also cultivates their innovation and entrepreneurship skills, teamwork abilities, organizational planning competencies, and craftsmanship spirit.

4 Path Optimization Of Scientific

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RESEARCH AND EDUCATION IN ENGINEERING MAJORS IN LOCAL UNIVERSITIES IN GUIZHOU

Given the inherent challenges in enhancing research-practice capabilities among engineering students at Guizhou's local universities — characterized by relatively weaker academic foundations and the imperative to align education with regional socioeconomic development — the province faces significant hurdles. To effectively implement China's national strategy of "research-driven education," it requires both strategic planning and targeted implementation at institutional levels. This dual approach will allow engineering schools to leverage their research strengths, optimize educational frameworks, and establish a comprehensive ideological-political education system. Through this research-oriented pedagogy, we can cultivate well-rounded engineering talents who embody the Chinese modernization vision: individuals with ideals, expertise, and social responsibility—what we call the "new engineering" talent type.

4.1 INTEGRATING SCIENTIFIC RESEARCH EDUCATION INTO THE "FIRST LESSON" EDUCATION

We should make full use of the opportunity of "the first lesson for new students", "the first lesson for the semester" and "the first lesson for professional education", integrate scientific research education into the "first lesson", enlighten students on scientific research education, train their basic scientific research ability, let them know what is scientific research, where to do scientific research and why to do scientific research, and dare to do scientific research.

4.1.1 WE SHOULD STRENGTHEN VALUE GUIDANCE, STIMULATE STUDENTS 'INTERNAL DRIVING FORCE FOR SCIENTIFIC RESEARCH, ENHANCE STUDENTS' AWARENESS OF SCIENTIFIC RESEARCH, AND LET STUDENTS DARE TO DO SCIENTIFIC RESEARCH

The first lesson for freshmen in ideological and political education serves as the cornerstone of guiding socialist core values. It is crucial for stimulating students' intrinsic motivation in scientific research and enhancing their awareness of research-oriented learning. To effectively conduct this foundational education for engineering students, the key lies in delivering well-structured principles that are thoroughly explained, comprehensively explored, and vividly presented.

First, clarify the relationship between engineering disciplines and scientific research activities. In light of the current challenges and policies facing engineering programs, it is crucial to explain how national policies prioritize cultivating "new engineering" talents, vigorously develop advanced manufacturing industries, and enhance high-end manufacturing capabilities in engineering disciplines and students. We must highlight the close connection between engineering education and practical research, the alignment between scientific practice and societal needs, as well as the correlation between research competencies and career development. This approach aims to inspire engineering students 'sense of mission and motivate them to actively engage in research. Educational surveys reveal that 92.88% of students at Zunyi Normal University's School of Engineering demonstrated strong research aspirations, demonstrating significant educational effectiveness.

Secondly, we should guide students to cultivate the noble ideal of "industrial patriotism" and strive to become "new engineering talents" that meet the demands of Chinese-style modernization. It is essential to clarify the key components required for such talents in China's modernization drive, emphasizing that their core competitiveness lies in "moral integrity and technical excellence." We must clearly explain the relationship between research-oriented education and university ethos, scientific spirit, and craftsmanship. Through practical research experiences, students will develop qualities like perseverance, diligent study, pioneering spirit, and dedication to serving the nation through technology, while also fostering a scientific mindset characterized by pragmatic innovation and self-reliance.

4.1.2 STRENGTHEN THE TRAINING OF BASIC KNOWLEDGE OF SCIENTIFIC RESEARCH AND THE CULTIVATION OF CORE SCIENTIFIC RESEARCH LITERACY, AND IMPROVE STUDENTS' COMPREHENSIVE ABILITY IN SCIENTIFIC RESEARCH

Research indicates that 92.88% of engineering students demonstrate research motivation. However, when it comes to research engagement methods, 67.04% choose faculty-led projects while 15.36% opt for peer-initiated research initiatives. A key reason students prioritize faculty-led projects stems from their lack of research expertise, highlighting the need to enhance scientific research training. The fundamental solution lies in teaching students "how to conduct research".

The first aspect involves the process-oriented knowledge and capabilities in scientific research, which constitute our "hard power". This includes a step-by-step process: identifying questions from real-world needs or uncertainties → conducting literature review → proposing solutions → validating proposals → implementing experiments → and summarizing findings for broader application. These processes demonstrate students' awareness and ability to formulate inquiries, their capacity to analyze and process information through research, their proficiency in applying professional knowledge to solve practical problems, and their hands-on experimental skills.

The second is to cultivate the scientific research spirit of seeking truth and innovation, the cooperative spirit of unity and cooperation, and the craftsman spirit of daring to fight, good at studying and perfecting. These "soft skills" are exactly the core quality of new engineering students.

4.2 WE WILL DO A GOOD JOB IN TOP-LEVEL DESIGN AND PRECISE IMPLEMENTATION AT THE GRASSROOTS LEVEL TO OPEN UP THE "LAST KILOMETER" OF SCIENTIFIC RESEARCH AND EDUCATION

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4.2.1 The Transformation Of The Scientific Research Evaluation System From The Assessment Of Teachers' Scientific Research Achievements To The Effectiveness Of Scientific Research Education

We should change the concept of teachers 'scientific research assessment, change from the assessment of teachers' scientific research achievements to the effectiveness of scientific research education, and integrate students 'participation in teachers' scientific research into the performance assessment index system of teachers' scientific research.

First, institutional safeguards should ensure students have equitable opportunities to engage in scientific research training. At the university level, clear regulations must specify the annual quotas for laboratory participation, research platforms, and research studios. The School of Engineering should then develop detailed and actionable implementation plans for cultivating research-oriented education.

Secondly, in the performance evaluation of teachers 'research activities, we should adopt the "OBE" model (Outcomes-Based Education) approach. This involves shifting focus from merely counting the number of projects teachers initiate, lead, or complete, to evaluating how many students they mentor in these projects and the improvement in students' capabilities through hands-on research training. The assessment framework should transition from solely measuring research achievements to evaluating the practical effectiveness of research-driven education. For teachers who guide students in research projects, science competitions, innovation and entrepreneurship contests, and other activities with notable accomplishments, a reward system should be established to provide appropriate incentives based on their achievement levels.

4.2.2 Strengthen The Process-Oriented Understanding Of Scientific Research Education And The Evaluation Of The Improvement Of Comprehensive Professional Scientific Research Practice Ability In The Evaluation System Of Talent Training

To address the unique characteristics of engineering students, we will refine the talent development evaluation system by implementing phased assessments of research capabilities during internships and practical training. The evaluation framework is structured as follows: First-year students are assessed on their awareness of research practices, such as attendance at academic lectures. Second-year students focus on their participation in faculty-led research projects and student-led initiatives, including involvement in scientific competitions. Third-year students are evaluated based on independently led research projects, including college-wide innovation programs, university-level initiatives, professional contests, and technological inventions/patents. Fourth-year students undergo comprehensive evaluations of their process-oriented understanding of research education and overall practical research competencies.

4.2.3 Create A Good Atmosphere For Scientific Research Education Among Students, And Encourage And Support Their Scientific Research

On one hand, during scientific research training, students should be allowed to make mistakes and engage in trial-and-error learning, while being guided to "innovate boldly and verify meticulously." On the other hand, the design of student recognition systems should effectively motivate academic enthusiasm, encouraging engineering students to participate in research activities and even lead their own projects. This includes incorporating these principles into award evaluations and scholarship selections.

4.2.4 The Guarantee Mechanism Of Scientific Research And Education Has Changed From A Single Material Guarantee To A Three-Dimensional Guarantee Of Talents, Materials And Platforms

Higher education institutions in Guizhou should adopt a comprehensive "Grand Ideological and Political Education" framework for research-driven talent development. To ensure this approach yields tangible results, they must establish robust support mechanisms that encompass not only financial resources throughout the entire research process, but also innovation platforms, policy incentives for technology commercialization, and human capital investments. Only through such coordinated efforts can these institutions truly implement research-based talent cultivation with measurable outcomes.

4.3 Exploring The "Research +" Education Mode

We will actively explore the "research +" education model, such as research + Party building, research + teachers' studios, research + student associations, etc., and give full play to the gathering effect of party and youth league organizations and mass organizations to solve the platform problem of research-based education.

4.3.1 Scientific Research + Party Building + Teacher Studio, Promoting High-Quality Scientific Research And Education With High-Quality Party Building

The integrated model combining scientific research platforms, faculty studios, and Party building initiatives aligns with the functions of Party branches and Party member groups. This approach fully leverages the exemplary leadership and organizational capabilities of Party members. By providing concrete implementation tools for Party-building activities while offering ideological guidance and political safeguards for research-driven education, it ensures that educational research remains true to its original purpose without deviation. Furthermore, this synergy enhances the platform's effectiveness, creating a dynamic ecosystem that amplifies academic-industrial integration.

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4.3.2 Research + Student Associations, Giving Play To the Role Of Students' Self-Organization In Research Education

Student organizations, such as student associations and interest groups, are self-organized groups formed by students based on shared interests, hobbies, and professional development needs. These groups effectively facilitate the formation of research teams, conduct practical scientific activities, and cultivate a spirit of inquiry. For instance, Zunyi Normal University's College of Engineering utilizes platforms like the Civil Engineering Association and Mechanical Manufacturing Association. By leveraging opportunities from various professional competitions and innovation-entrepreneurship contests, these initiatives not only enhance students' research capabilities but also develop their entrepreneurial skills, teamwork abilities, organizational planning competencies, and craftsmanship ethos.

4.4 Based On The Local Economy, Serve The Local Development, And Create A Platform For Achievement Transformation And Display

The distinctive characteristics of local universities in Guizhou necessitate their commitment to regional economic development. By establishing platforms for technology commercialization and exhibition, these institutions can serve local growth while advancing academic research and fulfilling educational objectives. To achieve this vision, they should implement a "triple integration" model that synergizes three key dimensions: aligning faculty research with regional needs, bridging developmental demands with student specializations, and integrating research outcomes with professional practice.

4.4.1 Engineering Teachers In Local Universities Should Take The Initiative To Combine Their Own Research With Serving The Local Economic Development

The integration of academic research with regional economic development by faculty at Guizhou's local universities not only demonstrates institutional commitment but also fulfills their historical mission. As engineering department faculty, we should proactively engage with local governments, communities, and enterprises to bridge scientific innovation with practical needs, effectively addressing real-world challenges. Furthermore, given the cutting-edge nature of university research, it naturally guides regional industrial growth and provides strategic support for corporate development. This research-driven approach to economic advancement simultaneously enriches teaching content, facilitates pedagogical reforms, and enhances talent cultivation programs.

4.4.2 The Training Objectives Of Engineering Majors In Local Universities Should Be Combined With The Needs Of Local Development

Engineering programs in Guizhou's regional universities should serve as crucial pillars for local economic development. Talent cultivation objectives must align with regional socioeconomic needs and future workforce demands. Take Zunyi Normal University's "Mechanical Design, Manufacturing, and Automation" program as an example: its talent development focuses on cultivating professionals in "mechatronics" and "mechanical manufacturing," yet the program's broad scope and insufficient specialization fail to meet local economic requirements. According to Guizhou's top ten industrial sectors (2021 data), the total output value of these industries reached 1.277491 trillion yuan, with the top five sectors being modern new energy (352.005 billion yuan), basic materials (172.104 billion yuan), premium tobacco and liquor (161.851 billion yuan), eco-characteristic food (160.068 billion yuan), and big data/electronic information (159.763 billion yuan). Therefore, the Mechanical Design, Manufacturing, and Automation program should integrate specialized training modules aligned with Guizhou's key industries — modern new energy manufacturing, premium liquor production, and eco-characteristic food manufacturing. This targeted refinement will help establish well-structured talent development goals, actively cultivating high-quality new engineering professionals for regional economic growth.

4.4.3 Combine The Transformation Of Scientific Research Achievements With Students' Professional Practice, And Create A Platform For The Transformation And Display Of Achievements

By integrating regional economic development with student cultivation objectives, teachers 'research is grounded in local economic growth. Local enterprises serve as bases for teaching and technology transfer at regional universities, platforms for showcasing academic achievements, and practical training grounds for engineering students' professional research and teaching internships. This approach further establishes collaborative mechanisms for talent development and team building, creating a virtuous cycle that aligns university engineering education with regional needs. Consequently, it not only fulfills the vision of "writing papers on the ground" for educators but also cultivates students' scientific spirit of pragmatic innovation, their craftsmanship ethos of pursuing excellence through meticulous refinement, and their dedication to serving national demands while contributing to local economic development.

Fundings

Zunyi Normal University's 2022 Ideological and Political Education Research Program.

About The Author

Tang Zhanying, associate professor and deputy director of the Long March Culture Research Institute at Zunyi Normal University. His research focuses on Marxist theory, the Long March spirit, and the Zunyi Meeting spirit.

REFERENCES

[1]Boyer, E. L. (1990). Scholarship reconsidered: Priorities of the professoriate. Princeton University Press.

[2]Central Committee of the Communist Party of China & State Council. (2017). Guidelines on strengthening and improving ideological and political work in higher education institutions under new circumstances.

[3]Healey, M., & Jenkins, A. (2009). Developing undergraduate research and inquiry. The Higher Education Academy.

[4]Healey, M., Flint, A., & Harrington, K. (2014). Engagement through partnership: Students as partners in learning and teaching in higher education. The Higher Education Academy.

[5]Ministry of Education of the People's Republic of China. (2017). Implementation outline for enhancing the quality of ideological and political education in higher education institutions.

[6]Griffiths, R. (2004). Knowledge production and the research-teaching nexus: The case of the built environment disciplines. Studies in Higher Education, 29(6), 709–726.

[7]Li, J., & Li, M. (2021). Integrating ideological and political education into college English curriculum: A case study of a Chinese university. Journal of Higher Education Policy and Management, 43(2), 210–225.

[8]Wang, X., & Li, S. (2022). Craftsmanship spirit cultivation in engineering education: A policy analysis in China. International Journal of Educational Development, 89, 102541.

[9]Zhao, L., & Wang, N. (2019). The strategy of integrating research into teaching in engineering education: A case study of local universities in China. IEEE Transactions on Education, 62(4), 309–317.

[10]Zhou, G., & Wang, J. (2023). Implementing the 'Three-Aspect Education' model: Challenges and strategies for Chinese universities in the new era. Higher Education Policy, 36(1), 45–63.