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Strategic Planning in Applied Medical Education: A Three-Tier Six-Stage Framework from Qilu Medical College

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ABSTRACT

This study explores the formulation and implementation of strategic planning in application-oriented medical colleges, using Qilu Medical College as an empirical case. Adopting a qualitative document-based case analysis approach, this research thematically analyzes 30 official internal documents, policy directives, and administrative records with document triangulation to ensure analytical rigor. The findings indicate that effective strategic planning in applied medical education requires a three-tier governance hierarchy (strategic, tactical, and operational), a six-stage iterative implementation process (environmental judgment, target quantification, practice-driven execution, dynamic monitoring, effect evaluation, and adjustment), and four key drivers of strategic effectiveness (policy alignment, academic-industry collaboration, dynamic monitoring, and dynamic adjustment). By shifting from static blueprints to flexible administrative processes, the college resolves cross-departmental decoupling and enhances adaptability to changing external healthcare mandates. This study constructs a localized structural-processual framework for institutional governance, addressing the lack of empirical research on specialized professional higher education and providing an actionable reference for peer applied medical colleges to strengthen strategic capacity and institutional resilience.

INTRODUCTION

Strategic planning has become an essential governance mechanism for higher education institutions worldwide, supporting effective resource allocation, long-term priority setting, and responsiveness to complex social, economic, and technological environments (Al-Zafiry & Al-Harthi, 2023; Bryson, 2018; Tierney & Lanford, 2024; Alisor *et al.*, 2024). In contemporary higher education, strategic planning is no longer merely an administrative task but a dynamic, iterative governance process that connects institutional vision, resource management, organizational performance, and external stakeholder expectations amid digital transformation and industry restructuring (Uhly-Ben & Arena, 2024; Li & Atkins, 2025). Amid globalization, technological transformation, labor market shifts, and accountability pressures, strategic planning capacity has become critical to institutional sustainability and competitiveness.

Strategic planning is particularly vital in medical education. Unlike other disciplines, medical education operates in a highly regulated field, with educational outcomes directly affecting public health systems and healthcare delivery. Medical colleges must meet academic quality standards, professional accreditation requirements, workforce development needs, and rapidly evolving healthcare demands (Frenk *et al.*, 2010; Heitmann, 2022; Wang, 2025). Thus, strategic planning in medical education demands a sophisticated governance approach that balances policy compliance, educational quality, clinical competency development, and industry engagement against the backdrop of the “New Medical Science” reform (General Office of the State Council, 2020).

In China, the transformation of higher education has accelerated under national initiatives for educational modernization and high-quality development. Policies such as the Healthy China 2030 Plan and the 14th Five-Year Plan for National Education Development emphasize the cultivation of application-oriented professionals, industry-education integration, and improved institutional governance (Ministry of Education, 2021; National Health Commission, 2016). Combined with the national guidelines for medical education innovation and the forward-looking layout of the 15th Five-Year Plan for education, the development orientation of applied medical colleges has been further clarified (General Office of the State Council, 2020; Gao, 2026; Zhang & Wang, 2025). The 2025 National Two Sessions also focused on the integration of medical education and clinical practice, standardization of talent training, and digital empowerment of medical education, putting forward new requirements for the strategic management of medical colleges (Wang, J. A., 2025; Cao, J. L., 2025). In this context, application-oriented medical colleges shoulder growing responsibilities: educating healthcare professionals, supporting regional healthcare development, promoting academic-industry collaboration, and contributing to local socioeconomic progress.

Despite the recognized importance of strategic planning, many application-oriented medical colleges face severe implementation challenges. Current planning practices often rely on top-down policy translation, overemphasizing government directives while neglecting institutional contexts. Planning objectives are often

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broad and aspirational, lacking measurable indicators and operational guidance. Monitoring and evaluation mechanisms are underdeveloped, hindering progress tracking and timely adjustment. As a result, large gaps often exist between strategic intentions and actual outcomes.

These challenges are compounded by rapid changes in healthcare: advances in medical technology, shifting public health priorities, demographic transitions, and higher expectations for healthcare quality require high strategic adaptability. Application-oriented medical colleges need planning systems that support long-term development while enabling continuous adjustment to environmental changes, highlighting the demand for frameworks integrating strategic vision, operational implementation, performance monitoring, and organizational learning. Although strategic planning is widely discussed in higher education literature, research focusing on application-oriented medical colleges remains limited. Existing studies mainly target comprehensive research universities or general vocational institutions, paying insufficient attention to the unique governance characteristics of medical education. Moreover, prior research often examines organizational structure or implementation process separately, limiting understanding of strategic planning as an integrated governance mechanism. There is a lack of empirical research explaining how strategic planning operates in application-oriented medical institutions and how to improve its effectiveness.

Against this background, Qilu Medical College provides a suitable case for studying strategic planning in applied medical higher education. As a representative institution undergoing continuous reform and development, the college has built a relatively mature strategic planning system combining hierarchical governance and an iterative implementation process. By examining this case, this study explores how strategic planning is formulated, implemented, monitored, evaluated, and optimized in an application-oriented medical college.

This study has four objectives:

- Analyze the operational mechanisms for strategic implementation and monitoring.
 - Examine the hierarchical structure of educational strategic planning at Qilu Medical College.
 - Identify organizational and environmental factors influencing implementation effectiveness.
 - Develop an integrated conceptual framework to inform strategic planning in peer applied medical colleges.
- To achieve these objectives, this study addresses three research questions:

RQ1: How is strategic planning operationalized within Qilu Medical College?

RQ2: What structural and processual mechanisms support strategic implementation in an application-oriented medical institution?

RQ3: What factors influence the effectiveness of strategic planning in applied medical education?

By answering these questions, this study examines multi-

level governance structures, procedural stages, and performance drivers that translate institutional vision into operational practice. Integrating policy analysis, institutional governance perspectives, and empirical evidence from Qilu Medical College, this research enriches the literature on educational strategic planning and provides practical insights for improving governance capacity, implementation effectiveness, and institutional adaptability in applied medical higher education.

LITERATURE REVIEW

Strategic Planning in Higher Education

Strategic planning originated in corporate management and was adopted by higher education institutions to navigate volatile socioeconomic environments (Al-Zafiry & Al-Harhi, 2023; Bryson, 2018). In the early stage, universities regarded strategic plans as rigid static blueprints; however, the continuous expansion of institutional scale and the diversification of funding sources have forced higher education institutions to adopt more flexible and adaptive administrative mechanisms (Hinton, 2012). Modern higher education governance emphasizes balancing long-term institutional priorities with short-term resource reallocation to maintain viability amid fluctuating state support (Clark, 1983).

Mintzberg (1994) argued that traditional formalized planning models often fail amid rapid external disruption. Effective strategic systems should integrate deliberate pre-determined paths with emergent strategies from real-time operations (Mintzberg, 1994). In contemporary university governance, this means less focus on static documentation and more on flexible communication across academic units (Middlehurst, 2013; Shattock, 2021). Planning is increasingly viewed as an ongoing iterative loop rather than a discontinuous bureaucratic task (De Boer *et al.*, 2007).

Strategic Governance in Medical Education

Implementing institutional strategy in medical colleges faces unique administrative challenges due to the coexistence of higher education and clinical healthcare (Frenk *et al.*, 2010). Medical programs are bound by strict professional accreditation, complex curricula, and societal obligations for patient safety and public health. Educational strategies must maintain rigorous technical standards while responding to changing healthcare needs (Trevitt & Stocks, 2023).

This multi-sectoral dependence requires specialized governance. Traditional top-down management struggles with the complexity of external health mandates, hospital networks, and clinical training requirements (Dopson *et al.*, 2019).

Studies show medical institutions need distributed leadership to align academic instruction with clinical performance benchmarks (Bolden *et al.*, 2015). Strategic systems must manage dual obligations to educational regulators and health industry partners.

Policy Context of Applied Medical Education in China

Over the past two decades, China's higher education has undergone structural changes driven by state initiatives for regional integration, high-quality development, and application-oriented development (Ministry of Education, 2021). National policies require regional universities to align talent cultivation with local industrial workforce needs (Mok, 2016). For applied higher education institutions, this means shifting from purely theoretical instruction to practice-driven curricula.

In the medical sector, this direction is guided by national health initiatives such as Healthy China 2030, which calls for expanded primary healthcare and community-oriented medical professionals (National Health Commission, 2016). Applied medical colleges play a key role in training frontline healthcare practitioners (Yang, 2020). These institutions operate within a centralized governance structure, with funding and legitimacy dependent on alignment with provincial health initiatives and regional health priorities (Marginson, 2011; Marginson, 2023). In 2025, the National Two Sessions further emphasized the integration of medical education and clinical practice, standardized training of clinical talents, and digital technology empowerment for medical education, urging applied medical colleges to optimize strategic planning systems to match the new demands of the healthcare industry (Cao, J. L., 2025; Wang, J. A., 2025). Under the guidance of national and local policies, digital governance and real-time monitoring have gradually become standard configurations for the strategic management of domestic medical colleges.

Structural and Processual Framework Gaps

The literature on higher education strategic management remains largely bifurcated: one stream focuses on structural configurations (administrative hierarchies, committees, authority), and the other emphasizes processual implementation (metrics, performance reviews, accountability). This division creates a gap in understanding how structures and processes interact over time.

Furthermore, limited research explores combined structural-processual frameworks in specialized application-oriented professional schools. Most generic models derive from comprehensive research universities or technical vocational colleges, overlooking clinical constraints and professional boundaries in medical education (Frenk *et al.*, 2010; Hristov *et al.*, 2022). There is a lack of empirical evidence on integrating multi-level governance with responsive, data-driven execution to enhance policy compliance and operational adaptability.

Strategic Framework Formulation through Empirical Case Analysis

This study addresses these theoretical and contextual gaps through a qualitative document-based case analysis of Qilu Medical College. Document analysis is suitable for investigating complex real-world administration over

time using multiple data sources (Yin, 2018). This study examines how multi-level governance, iterative processes, and effectiveness drivers interact to support strategic implementation in applied medical higher education (Pfeffer & Salancik, 2003; Yin, 2018).

The analysis goes beyond static institutional description to explore how professional schools align with non-academic sectors (Heiskanen, 2023; Shattock, 2021). The resulting integrated framework shows how policy mandates, industry integration, real-time tracking, and adaptive flexibility reduce administrative friction and support long-term institutional resilience (Mintzberg, 1994).

MATERIALS AND METHODS

Research Design

This study adopts a qualitative document-based case analysis, suitable for exploring university management and enabling in-depth analysis of the logic and practice of strategic planning in applied medical colleges (Yin, 2018). The analysis follows five core steps:

- Define the research problem and objectives.
- Select the case.
- Collect multi-source data.
- Conduct thematic analysis.
- Summarize findings and administrative implications.

This method captures the specificity and complexity of strategic planning in applied medical colleges, reflecting practical features based on official records, internal documents, and policy texts.

Data Sources and Sampling

This study uses purposive sampling to select institutional documents, policy materials, implementation reports, and industry collaboration records related to strategic governance in applied medical education. As a document-based case study of Qilu Medical College, the primary data are official internal texts, operational portfolios, and policy matrices, with no human interviews involved. A total of 30 valid official internal documents approved for academic research are selected based on relevance to institutional strategy, alignment with national health initiatives, and links to regional academic-industry collaboration.

Instrument

The primary tool is an institutional document analysis protocol for systematic evaluation of strategic management formulation and execution. To ensure content validity, the analytical framework is grounded in higher education governance literature, covering three core dimensions:

- Governance Structure: Evaluates alignment between macro strategic goals and operational units, and the distribution of administrative authority.
- Strategic Implementation Process: Examines chronological stages from environmental assessment to executive actions.

• **Strategic Effectiveness Factors:** Identifies internal capabilities and external collaborative conditions affecting implementation.

To minimize interpretive bias, each text segment is cross-referenced against these three dimensions before formal thematic coding.

Ethical Considerations

This study complies with academic integrity and institutional ethical standards.

All materials are used exclusively for academic research and handled in accordance with confidentiality, responsible research conduct, and intellectual property requirements.

Research Object

This study selects Qilu Medical College as the case, located in Shandong Province—a major province in population, economy, education, and healthcare. The selection is based on three reasons:

• **Strong Representativeness:** As a key applied medical college in Shandong, it has a complete medical discipline system covering clinical medicine, nursing, stomatology,

pharmacy, medical imaging, and medical laboratory science.

• **Rich Experience in Strategic Planning:** It has expanded disciplines and formulated a series of strategic documents (e.g., the “137 Development Strategy”), forming a structured hierarchical system and implementation process.

• **Distinctive industry-education integration:** It maintains extensive cooperation with local governments and healthcare networks to build a “domestically renowned and distinctive applied medical undergraduate university”.

Data Collection and Coding System

This study uses multi-source data collection to ensure comprehensiveness, authenticity, and validity. The data corpus includes four categories, totaling 30 valid official research internal documents for the thematic analysis. All materials are strictly screened and cross-validated to remove inconsistent or invalid information.

To maintain a clear evidence chain and analytical transparency, Table 1 presents the coding system for the textual data.

Table 1: Coding System for Qualitative Document Analysis

Code	Category	Empirical Scope	Quantity
Doc	Institutional Strategic Planning Documents	Core strategic documents: College’s 137 Development Strategy, Institutional Five-Year Plans, Educational Target Documents, and Mid-term Strategic Revision Protocols.	8
Rep	Internal Evaluation Reports	Administrative Dossiers, Annual Work Reports, Strategic Progress Assessments, Real-time Operational Dashboard Records, and Internal Quality Audit Files.	6
Pol	Government Policy Documents	National and Regional Higher Education Policies, Healthcare Macro Guidelines, Ministerial Regulations, and Provincial Healthcare Development plans.	11
Ind	Industry Collaboration Records	Partnership Agreements with Tertiary Hospitals and Biomedical Enterprises, and Feedback from External Healthcare Stakeholders.	5
Total			30

Data Analysis

This study uses thematic analysis to decode multi-source organizational text data. To ensure rigor, all coding is conducted through systematic thematic analysis with repeated verification and triangulation across document types.

The analysis includes four interconnected stages:

• **Open Coding:** Repeatedly review verified materials to extract core conceptual fragments (e.g., strategic positioning, target quantification) and form initial codes through iterative review.

• **Axial Coding:** Classify and cluster initial codes by structural relationships into secondary categories (e.g., three-level hierarchical system, six-stage process).

• **Selective Coding:** Take “the localized strategic planning

system of an applied medical college” as the core theme, and refine themes until theoretical saturation.

• **Triangulation Verification:** Cross-verify data from institutional documents, policy texts, and industry records to eliminate individual interpretive bias and ensure credibility.

Research Limitations

This study adopts a single-case design focusing on Qilu Medical College, which may limit analytical generalizability to medical colleges with different regional contexts, resource endowments, or development stages. The research relies solely on documentary data without participatory data such as interviews or observations, which may restrict understanding of frontline

implementation perceptions and practices. Future research may adopt a multi-case comparative design, integrate mixed methods, and expand samples across regions to further test and refine the framework

RESULTS AND DISCUSSION

Three-Level Structure of Educational Strategic Planning
Textual evidence shows Qilu Medical College has

organized its strategic planning into a three-tier governance hierarchy: strategic, tactical, and operational. These levels function as flexible administrative mechanisms to facilitate communication between central administration and frontline academic divisions. The structural dimensions and parameters are shown in Table 2.

Table 2: Structural Levels and Institutional Parameters of the Strategic Planning System

Hierarchical Level	Core Function and Scope	Governing Principle / Guideline	Practical Institutional Examples
Strategic Level	Top-level macro design and long-term institutional orientation.	Alignment with national "Healthy China 2030" and provincial healthcare blueprints.	Cultivating high-quality applied medical talents with proficient professional skills to serve regional health industry demands.
Tactical Level	Intermediate link converting abstract strategic goals into operational fields.	Adherence to the SMART principle (quantifiable, operable, time-bound).	Setting explicit milestones across 5 domains (e.g., "dual-qualified" course teachers >80%; graduate physician exam pass rate >70%).
Operational Level	Bottom-level execution transforming tactical targets into concrete action plans.	Level-by-level implementation and functional department collaboration.	The active recruitment of 50+ industry practitioners as part-time faculty; Academic Affairs Office leading cross-departmental quality tracking.

The findings suggest a flexible governance arrangement improves coordination between strategic objectives and operational activities. Historically, the institution faced structural decoupling: central administrators issued broad targets, while frontline departments prioritized routine instruction over strategic reform.

To address this, the tactical level acts as an intermediary translation mechanism. For example, when Doc-01 mandated regional alignment, the tactical tier converted this goal into specific performance agreements signed by department heads (Doc-03). This structure shows how professional institutions use intermediate layers to translate policy demands into daily workflows without over-centralization (Vukasovic, 2022).

The Six-Stage Processual Framework

Implementation follows six sequential stages designed to sustain continuity and reduce implementation gaps.

Environmental Judgment

The framework starts with ongoing situational auditing, tracking external policy updates and internal resource constraints.

Data Extract 1 (Doc-02): "The gap between digital healthcare adoption in tertiary hospitals and traditional laboratory setups in nursing and imaging is the main threat to regional employment metrics."

The college treats environmental scanning as a continuous activity, not a one-time pre-planning task. Early identification of digital healthcare gaps allows timely adjustment of internal instruction to external

health sector signals (Heiskanen, 2023).

Target Quantification

Abstract ambitions are translated into operational tasks via specific, measurable metrics across five areas: talent cultivation, scientific research, industry collaboration, faculty development, and campus infrastructure.

Data Extract 2 (Doc-04): "The School of Nursing is required to deepen cooperation with Grade-A tertiary hospitals to build joint clinical simulation laboratories and steadily increase investment in off-campus practical training within the specified time frame. Failure to complete relevant development tasks will affect the department's daily operational funding."

This contract matrix links long-term strategy to resource allocation. Explicit budget consequences reduce reliance on vague mandates, addressing implementation gaps in centralized education systems (El-Ghalayini, 2021).

Practice-Driven Execution

The college supports targets through dedicated financial channels and cross-departmental interventions.

Data Extract 3 (Rep-03): "To bridge medical theory and clinical practice, the institution allocated special funds for integrated organ-system curriculum reform, bypassing traditional departmental budget boundaries."

Dedicated funding for curriculum restructuring addresses internal resource competition among academic divisions. This shows applied programs rely on mechanisms directing internal resources to external clinical competencies (Pfeffer & Salancik, 2003).

Dynamic Monitoring

The college uses a real-time tracking system to monitor execution data and identify performance delays early. This digital monitoring model is consistent with the intelligent management practice of many domestic medical colleges in recent years. For instance, Guizhou Medical University has built an IOC visual operation cockpit and a comprehensive student data platform to realize full-cycle digital monitoring of institutional operation, talent training and strategic implementation, which effectively improves the timeliness of problem discovery and intervention (Ji Mu News, 2025).

Data Extract 4 (Rep-05): “The monitoring system issued an automated alert in Q3, as the proportion of dual-qualified instructors in Pharmacy failed to reach the scheduled target. The college promptly arranged a meeting with HR to tackle difficulties in teacher recruitment.”

This approach shifts from retrospective evaluation to real-time intervention. Linking automated metrics to administrative reviews prevents strategic drift and timely corrects delays (Hristov *et al.*, 2022).

Effect Evaluation

Evaluation uses an annual tripartite system: departmental self-audits, peer panel assessments, and on-site document verification.

Data Extract 5 (Rep-06): “Strategic implementation scores are calculated using weighted indicators. Results are directly linked to leadership performance appraisals and department resource allocation.”

Integrating real-time monitoring and tripartite evaluation responds to the need for accountability mechanisms that shape organizational behavior, not just bureaucratic formalities (Yin, 2018).

Adjustment and Optimization

The final stage institutionalizes organizational learning, allowing mid-course revisions in response to policy shifts or internal feedback.

Data Extract 6 (Doc-05): “In case of major regional health policy adjustments or uncorrectable execution barriers, the Strategic Development Committee has the authority to issue mid-term plan revisions.”

This optimization loop confirms long-term plans can maintain focus while allowing operational revisions amid environmental change (Mintzberg, 1994).

Key Factors Influencing Strategic Planning Effectiveness

The findings indicate that strategic planning effectiveness in applied medical education is driven by four interactive factors: policy alignment, academic-industry collaboration, data-driven dynamic monitoring, and dynamic adjustment. Rather than operating independently, these factors function as an integrated governance mechanism that supports strategic implementation, organizational learning, and institutional adaptability. Policy alignment provides external legitimacy and developmental

direction; academic-industry collaboration strengthens practical relevance and stakeholder engagement; data-driven dynamic monitoring enhances accountability and evidence-based management; and dynamic adjustment enables continuous adaptation to changing policy, technological, and healthcare environments. Together, these four factors explain how strategic planning effectiveness is sustained within Qilu Medical College.

Policy Alignment

Policy alignment serves as the foundational driver of strategic planning effectiveness. As an application-oriented medical institution, Qilu Medical College formulates its strategic priorities within the broader framework of national and provincial healthcare policies. Through continuous alignment with major initiatives such as the Healthy China 2030 Strategy and regional healthcare workforce development plans, the institution ensures that its educational objectives remain consistent with evolving governmental expectations and public health priorities. Such alignment not only strengthens institutional legitimacy but also facilitates access to policy support, financial resources, and development opportunities. The findings suggest that effective strategic planning depends on the ability of institutions to translate external policy mandates into internally actionable objectives. Therefore, policy alignment provides the external governance foundation upon which strategic planning effectiveness is built.

Academic-Industry Collaboration

Academic-industry collaboration represents a second critical driver of strategic planning effectiveness. The findings reveal that sustained partnerships with tertiary hospitals, healthcare organizations, and biomedical enterprises enable the institution to maintain the practical relevance of its strategic objectives. Through collaborative curriculum design, clinical training arrangements, faculty exchanges, and joint practice platforms, the college is able to respond more effectively to emerging healthcare technologies and workforce requirements. These collaborative mechanisms strengthen the connection between institutional planning and labor market expectations, ensuring that strategic priorities remain responsive to professional and industry needs. The evidence suggests that external stakeholder engagement enhances implementation effectiveness by reducing the gap between educational planning and real-world healthcare practice.

Data-Driven Dynamic Monitoring

Data-driven dynamic monitoring is another important factor supporting strategic planning effectiveness. Against the backdrop of digital transformation in higher education, traditional periodic summary reporting can no longer adapt to the rapid iteration of strategic goals (Alisor *et al.*, 2024). The institution has gradually shifted from periodic narrative reporting toward continuous

performance tracking supported by quantitative indicators and operational dashboards, a mainstream management model adopted by modern professional higher education institutions (Ahmad *et al.*, 2025). This monitoring system enables administrators to identify implementation gaps, assess departmental performance, and initiate corrective interventions in a timely manner. Real-time data extraction and visual dashboards break the information barrier between administrative departments and frontline teaching units, realizing data-based collaborative governance (Ali & Singh, 2024).

By providing objective evidence regarding strategic progress, the monitoring process improves organizational transparency and strengthens accountability across administrative levels. A six-year longitudinal case study of university strategic management proved that continuous data monitoring can effectively prevent strategic drift and improve the execution efficiency of institutional goals (Brown *et al.*, 2025). The findings indicate that effective monitoring transforms strategic planning from a static administrative document into a continuously managed process. Consequently, data-driven monitoring serves as a critical mechanism for ensuring implementation consistency and maintaining strategic momentum in applied medical colleges (Hristov *et al.*, 2022; Li & Atkins, 2025).

Dynamic Adjustment

The fourth driver of strategic planning effectiveness is dynamic adjustment. The findings demonstrate that strategic plans cannot remain effective unless institutions possess the capacity to adapt to changing environmental conditions. Rapid developments in healthcare policy, medical technology, demographic trends, and workforce demands require continuous reassessment of institutional priorities. Rather than treating strategic plans as fixed commitments, Qilu Medical College periodically reviews implementation outcomes, reallocates resources, and revises strategic actions when necessary. This adaptive approach allows the institution to balance long-term strategic consistency with short-term operational flexibility. The findings suggest that dynamic adjustment functions as an organizational learning mechanism that enables institutions to sustain effectiveness under conditions of uncertainty and change.

Taken together, these four interactive factors form an integrated framework of strategic planning effectiveness. Policy alignment establishes external legitimacy, academic-industry collaboration enhances practical relevance, data-driven monitoring strengthens implementation control, and dynamic adjustment supports organizational adaptability. Their interaction creates a mutually reinforcing governance system that enables Qilu Medical College to maintain strategic coherence while responding effectively to evolving healthcare and educational environments.

Theoretical and Practical Implications

At the theoretical level, this study contributes to

the literature on higher education governance by developing an integrated framework that combines governance structure, implementation processes, and effectiveness factors within a single analytical model. Previous studies have often examined organizational structures or implementation mechanisms separately. By linking a three-tier governance hierarchy with a six-stage implementation process and four effectiveness drivers, this study provides a more comprehensive explanation of how strategic planning operates within application-oriented medical institutions. The findings also extend existing discussions of strategic adaptability by demonstrating how institutional planning systems can respond to changing policy and industry environments while maintaining organizational coherence.

At the practical level, the findings provide several implications for administrators and policymakers in applied higher education. First, strategic planning should be closely aligned with national and regional policy priorities to ensure institutional relevance and sustainability. Second, stronger collaboration with healthcare organizations and industry partners can improve the responsiveness of educational programs to workforce needs. Third, data-driven monitoring systems can enhance accountability and support evidence-based decision-making during implementation. Finally, institutions should establish formal mechanisms for periodic review and adjustment so that strategic plans remain responsive to changing external conditions. Together, these measures may strengthen governance capacity and improve the effectiveness of strategic planning across application-oriented higher education institutions.

CONCLUSION

The case of Qilu Medical College demonstrates that effective strategic planning in application-oriented medical institutions depends on transforming static plans into flexible and adaptive administrative processes. Theoretically, this study integrates multi-level governance with a processual implementation framework, enriching understanding of how specialized institutions balance accountability to both education regulators and industry sectors (Al-Zafiry & Al-Harthi, 2023; Shattock, 2021).

The findings provide clear answers to the three research questions. Regarding RQ1, strategic planning is operationalized through an interconnected model that aligns long-term institutional goals with departmental activities and daily academic practices. Regarding RQ2, implementation is supported by a three-tier governance hierarchy and sustained through a six-stage iterative process that facilitates planning, execution, monitoring, and feedback. Regarding RQ3, strategic planning effectiveness is shaped by four interrelated factors: policy alignment, academic-industry collaboration, dynamic monitoring mechanisms, and adaptive resource allocation. Overall, the proposed framework offers a context-sensitive reference for similar application-oriented

medical colleges while recognizing that its applicability remains dependent on specific institutional and policy environments.

Policy Implications

In the context of educational modernization and the Healthy China strategy, application-oriented medical colleges should strengthen data-driven governance and deepen healthcare stakeholder collaboration:

- Upgrade strategic monitoring systems with operational dashboards to reduce delays and enable proactive management.
- Establish institutionalized industry-education integration channels (e.g., joint clinical simulation labs, collaborative training programs) to align curricula with evolving clinical competencies.
- Link performance evaluation outcomes to resource distribution and departmental budgets, creating incentives for substantive compliance and long-term institutional resilience.

Declarations

- Funding: This research was conducted without external financial support. All expenses were covered by the authors.
- Disclosure of Competing Interests: The authors declare no financial or non-financial interests that could have influenced the conduct or outcomes of this study. They confirm that they have not been involved in any complaint, allegation or conviction related to sexual harassment, sexual exploitation or abuse.
- Use of Generative AI: During manuscript preparation, the authors used ChatGPT (OpenAI) to refine language, improve readability and synthesize complex findings. All content was subsequently reviewed and edited by the authors, who take full responsibility for the interpretations and conclusions presented.

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