
| RESEARCH ARTICLE

Constructing and Exploring a Teaching Model for Integrating Professional and Innovation-Entrepreneurship Education for International Medical Students from the Perspective of Intrinsic Motivation

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| ABSTRACT

Under the dual drivers of the internationalization of medical education and innovation and entrepreneurship education policies, this study adopts Self-Determination Theory (SDT) as its theoretical foundation to explore the construction of an integrated teaching model combining professional education and innovation-entrepreneurship education (hereinafter referred to as "Professional-Innovation Integration") for international medical students. Utilizing a qualitative research paradigm, this study combines literature review and theoretical construction. Employing the three basic psychological needs—autonomy, competence, and relatedness—as an analytical framework, it systematically discusses the core elements, operational mechanisms, and practical pathways of the Professional-Innovation Integration teaching model from an intrinsic motivation perspective. The study reveals that stimulating the intrinsic motivation of international medical students depends on three factors: expanding curriculum autonomy, fostering clinical and innovative practical abilities through a step-by-step approach, and establishing teacher-student communities and cross-cultural relatedness. These three elements are dynamically coupled through a feedback mechanism, jointly supporting the transformation of Professional-Innovation Integration from concept to teaching practice. The intrinsic motivation perspective provides a novel theoretical tool and practical pathway to address the practical dilemmas faced by international medical students, such as "passive learning" and "weak innovation awareness." This study offers theoretical contributions and practical implications for enhancing the quality of foreign-related medical education and deepening the reform of Professional-Innovation Integration teaching.

| KEYWORDS

Intrinsic Motivation; Self-Determination Theory; Professional-Innovation Integration; International Medical Students; Teaching Model; Innovation and Entrepreneurship Education.

| ARTICLE INFORMATION

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1. Introduction

1.1 Research Background

1.1.1 The Trend of Internationalization in Medical Education

With the advancement of the "Belt and Road" Initiative and the continuous deepening of China's strategy for the internationalization of higher education, the scale of education for international students in China has been expanding. Medical education, as a crucial discipline chosen by international students, has become a vital window for the opening-up of China's higher education. Across neighbouring regions — especially ASEAN countries — demand for medical education and training is growing. A growing number of local medical colleges are training medical students from Belt and Road and ASEAN countries. This trend is reshaping medical education for international students, raising the bar for curriculum design, teaching quality, and

how clinicians are trained. Programs must now move beyond simply transmitting language and medical knowledge to building clinical competence, the capacity to innovate, and cross-cultural skills.

1.1.2 Policy Orientation of Innovation and Entrepreneurship Education

Concurrently, innovation and entrepreneurship education has become a significant direction in the comprehensive reform of China's higher education. The "Guiding Opinions of the General Office of the State Council on Deepening the Reform of Innovation and Entrepreneurship Education in Higher Education Institutions" [Guobanfa (2015) No. 36] explicitly mandates integrating innovation and entrepreneurship education throughout the entire talent cultivation process. Furthermore, policies related to the "New Medical Science" initiative and the "Guiding Opinions on Accelerating the Innovative Development of Medical Education" [Guobanfa (2020) No. 34] further emphasize that medical education should serve the "Healthy China" strategy by cultivating composite medical talents who possess both clinical competence and an innovative spirit. In this context, the integration of professional education with innovation and entrepreneurship education — known as "Professional-Innovation Integration" — has moved from policy goal to classroom practice. It is now a key driver in reshaping medical curricula.

1.1.3 Practical Dilemmas in the Cultivation of International Medical Students

However, implementing the concept of Professional-Innovation Integration in the teaching practice for international medical students still faces multiple dilemmas. First, language and cultural barriers make it difficult for international students to fully participate in innovation and entrepreneurship courses and activities primarily conducted in Chinese. Second, the learning motivation of international medical students exhibits strong instrumental characteristics, driven mainly by the need to pass qualification exams and obtain degrees, with relatively low willingness to engage in activities beyond the prescribed curriculum, such as scientific research exploration and innovation practice. Third, existing Professional-Innovation Integration models were designed for domestic students and rarely account for the cultural backgrounds, learning styles, and career paths of international medical students. As a result, these programs often fail to fit the students they serve. These dilemmas point to a core issue: how to genuinely stimulate the intrinsic motivation of international medical students to participate in Professional-Innovation Integration teaching activities, rather than relying on external discipline and assessment pressure to maintain superficial participation.

1.2 Problem Statement

Existing research on Professional-Innovation Integration teaching reform mostly focuses on external conditions such as curriculum design, platform construction, and faculty development, while paying relatively weak attention to learners' internal motivation mechanisms. There has been little theoretical exploration of international medical students as a distinct group. This research orientation of "emphasizing external conditions while neglecting internal drive" makes it difficult to fundamentally explain why the same Professional-Innovation Integration curriculum design yields vastly different participation outcomes and cultivation effects among different student groups. This study argues that only by examining the generative mechanism of learners' intrinsic motivation can a more explanatory and operational theoretical support be provided for the effective implementation of Professional-Innovation Integration teaching models. This study therefore asks a single core question: what Professional-Innovation Integration teaching model would best fit international medical students? It approaches that question through the lens of intrinsic motivation. What should be its core elements, operational mechanisms, and practical pathways?

1.3 Research Purpose and Significance

This study aims to use Self-Determination Theory as an analytical tool to systematically elaborate the theoretical construction logic and practical pathways of a Professional-Innovation Integration teaching model for international medical students from the perspective of intrinsic motivation. At the theoretical level, this study attempts to introduce SDT—a classic motivation theory originating from general psychology and educational psychology—into the specific and special teaching context of foreign-related medical education and Professional-Innovation Integration. It explores the theoretical applicability and scope for expansion of SDT in explaining the generation mechanism of international medical students' learning motivation, thereby enriching the theoretical toolkit for research on the internationalization of medical education. At the practical level, the core elements and practical pathways of the teaching model proposed in this study can provide actionable references for medical colleges, especially local medical institutions that train international medical students, in reconstructing Professional-Innovation Integration curricula, innovating teaching methods, and building international cooperation mechanisms. This will improve the quality of training for international medical students. It will also support the broader goal of internationalizing medical education and preparing medical professionals for the Belt and Road Initiative.

2. Literature Review and Theoretical Foundation

2.1 Theoretical Origin and Core Concepts of Intrinsic Motivation

Intrinsic motivation refers to the psychological tendency of individuals to spontaneously engage in activities due to the interest, satisfaction, or value recognition brought by the activity itself, in the absence of external rewards or punishments. Self-

Determination Theory (SDT), systematically proposed by Deci and Ryan(1985) in the 1980s , is one of the most influential theoretical frameworks in contemporary motivational psychology. The theory posits that human behavioral motivation exists on a continuum from "amotivation" to "external regulation," "introjected regulation," "identified regulation," "integrated regulation," and finally "intrinsic motivation." Ryan & Deci (2000) pointed out that the autonomous level of individual motivation depends on the satisfaction of three basic psychological needs: Autonomy—the need to feel that one's behavior is volitional rather than externally coerced; Competence—the need to feel effective in dealing with challenges and achieving expected outcomes; and Relatedness—the need to feel connected to others and to experience belonging and care. The degree of satisfaction of these three needs jointly determines the autonomous level of individual motivation, which in turn affects the quality, persistence, and creative performance of their behavioral engagement.

As Vallerand (1997) and Niemiec and Ryan (2009) have demonstrated that when the teaching environment supports learners' needs for autonomy, competence, and relatedness, learners are more likely to exhibit deep learning behaviors driven by intrinsic motivation, including higher learning engagement, stronger creative performance, and more persistent behavioral adherence. Self-determination theory provides a solid basis for understanding learners' motivation in innovation and entrepreneurship education, since such activities are inherently uncertain, challenging, and driven by autonomous exploration. Whether learners turn these activities into self-directed learning behaviors depends largely on whether the three basic psychological needs are met.

2.2 Definition of Professional-Innovation Integration and Its Specificity in Medical Education

"Professional-Innovation Integration" refers to the organic integration of professional education and innovation-entrepreneurship education at the levels of training objectives, curriculum systems, teaching methods, and evaluation mechanisms. Wang Huaiyu et al. (2023) pointed out that Professional-Innovation Integration emphasizes using professional education as the main carrier and curriculum construction as the foundation. Through systematic design of talent cultivation programs, it systematically embeds the cultivation of students' innovative spirit, entrepreneurial awareness, and innovation-entrepreneurship capabilities into professional courses, representing a paradigm shift in talent cultivation. Huang Mingrui and Chen Yuan (2023), in their review, noted that Ni Xiangli (2020) argued that universities should pursue integration from three perspectives: concept, objectives, and content.

Professional-Innovation Integration in medical education exhibits several specificities distinct from general disciplines. First, the mandatory nature of ethical constraints: medical innovation and entrepreneurship practices (e.g., medical device development, improvement of diagnostic and treatment technologies, and health service model innovation) must strictly adhere to medical ethics norms and patient safety requirements. This freedom is more tightly constrained than in other disciplines. Instructors must therefore design activities that preserve room for autonomous exploration while holding firm safety boundaries. Second, there is a strong correlation with clinical practice orientation. Medical Professional-Innovation Integration cannot be conducted in isolation from clinical contexts; its innovation activities often need to start from real or simulated clinical problems. This indicates that Professional-Innovation Integration curricula should be embedded in practical training — clinical rotations and internships — rather than offered as stand-alone courses. Third, the long-cycle nature brought about by life-science attributes. Compared with innovation and entrepreneurship projects in other disciplines, medical innovation projects (e.g., new drug development, diagnosis and treatment technology transformation) tend to involve longer development cycles and higher technical barriers. This poses special challenges to the cultivation of students' sense of competence—instructional design needs to compensate for the competence gap caused by the prolonged transformation cycle of outcomes through phased and visualized ability progression feedback.

2.3 Current Research Status on Teaching International Medical Students

Existing research clusters around three dimensions. First, cross-cultural teaching adaptability: this research examines how language barriers and cultural differences affect the classroom participation and learning outcomes of international medical students. Gilligan and Outram (2012), through focus group studies of international medical students in medicine, pharmacy, and nursing at the University of Newcastle, Australia, found that the core difficulties faced by international students included oral expression barriers, cultural differences in professional roles and expectations, differences in learning methods, insufficient extracurricular social interaction, and difficulties in accepting cultural and religious custom differences. These factors collectively led to their limited participation in classroom discussions and group growth activities. Second, English-medium curriculum development: this research addresses curriculum design, textbook development, and the preparation of faculty who can teach in English. Xiao Xinli et al. (2024), taking the construction of English textbook systems for human anatomy for international students at the Medical School of Xi'an Jiaotong University as an example, proposed that compiling English textbooks with Chinese characteristics is a key link in ensuring the quality of talent cultivation for international students in China, and summarized the supporting significance of English textbook construction for the construction of "first-class majors" and high-quality medical

talent cultivation. Third, clinical practicum teaching: this research explores how to maintain clinical teaching quality and patient safety when students and patients come from different cultural backgrounds. Aburas et al. (2020), based on a graduation survey of international medical students from four Chinese universities, showed that international students' oral expression and communication initiative had a more significant impact on their clinical experience and competence than their HSK (Chinese proficiency test) levels. Moreover, local patients' self-protection and privacy awareness also restrict international students' clinical hands-on opportunities, and simulation teaching is recommended as an effective remedy. Nagy et al. (2021) showed in a pre-post intervention study that patient-centered communication training works best when embedded in procedural skills practice rather than taught separately — as their blood-collection example illustrates. Overall, existing research has accumulated rich experience regarding the external conditions for teaching international medical students (curricula, textbooks, faculty, practice bases). However, attention to the emerging issue of innovation and entrepreneurship education for international medical students is still in its infancy, with a limited number of relevant studies and a need to strengthen theoretical depth.

2.4 Deficiencies of Existing Research

Based on the above literature review, existing research exhibits three obvious deficiencies. First, insufficient attention to motivation mechanisms. Existing research on Professional-Innovation Integration focuses largely on external conditions — curriculum design, support platforms, and institutional safeguards. Few studies explain why these programs produce such uneven results, and the motivational mechanisms behind those differences remain largely unexplored. As a result, teaching reforms tend to prioritize building systems and infrastructure over deepening what those systems actually deliver. Second, insufficient attention to group specificity. The subjects of existing Professional-Innovation Integration research are mainly domestic students. Research on international medical students remains extremely scarce. Their distinct cultural backgrounds, motivational profiles, and career goals mean existing models cannot simply be transferred to them. Third, a disconnect between theory and practical pathways. Although some studies have noted the importance of motivational factors, they mostly remain at the level of phenomenon description, lacking systematic theoretical framework support, making it difficult to translate motivation stimulation mechanisms into specific and operable teaching elements and implementation pathways. These three deficiencies jointly constitute the problem consciousness and theoretical entry point of this study.

3. Research Design Description

3.1 Research Paradigm

This study adopts a qualitative research paradigm. Distinct from empirical qualitative research that primarily relies on interviews and observations and analyzes data through coding, this study takes the form of conceptual inquiry, with theory construction as its central objective. The core task of this research paradigm lies in systematically sorting out, deeply interpreting, and logically deducing existing theories and literature, combining them with the realistic characteristics of specific educational contexts, to construct an analytical framework or theoretical model with internal logical self-consistency and practical explanatory power. The framework should be evaluated by the logical rigor of its construction, its power to explain practical problems, and its heuristic value for future research and teaching — not by statistical reliability and validity.

3.2 Research Methods and Data Sources

This study mainly adopts the literature research method and the theoretical deduction method. For the literature research method, it systematically retrieves and sorts out classic literature and cutting-edge progress of Self-Determination Theory, policy texts and academic discussions on the concept of Professional-Innovation Integration education, and research results related to the teaching of international medical students and the improvement of foreign-related medical education quality, serving as the knowledge base for the theoretical construction of this study. For the theoretical deduction method, this study takes the three basic psychological needs of Self-Determination Theory as the logical starting point, combines the specificity of Professional-Innovation Integration in medical education contexts, and systematically constructs the elements, mechanisms, and pathways of the Professional-Innovation Integration teaching model from the perspective of intrinsic motivation through conceptual interpretation, logical deduction, and contextualized analysis.

3.3 Analysis Framework Description

This study constructs a three-level progressive analysis logic of "Elements—Mechanisms—Paths": the "Elements" level answers what core components the Professional-Innovation Integration teaching model should include from the perspective of intrinsic motivation; the "Mechanisms" level answers how these core elements interact and operate synergistically to jointly promote the generation and transformation of learners' intrinsic motivation; the "Paths" level answers through what specific teaching reform measures these elements and mechanisms should be implemented. These three levels progress step by step, jointly forming the overall logical skeleton of the discourse in Part 4 of this study.

4. Research Findings and Discussion

Based on the three basic psychological needs of Self-Determination Theory and the realistic context of Professional-Innovation Integration teaching for international medical students, this study proposes that the Professional-Innovation Integration teaching model should include three core elements: autonomy support, competence cultivation, and relatedness connection.

4.1 Core Elements of the Professional-Innovation Integration Teaching Model from the Perspective of Intrinsic Motivation

4.1.1 Autonomy Support Element

The core of autonomy support lies in giving international medical students enough space for self-selection and self-direction, moving them from passive acceptance of the innovation and entrepreneurship program to active participation in designing its practices. Specifically, this element includes three levels: First, expanding curriculum choice space, i.e., setting flexible elective modules within the Professional-Innovation Integration curriculum system, allowing students to independently choose innovation and entrepreneurship practice directions based on their interest areas (e.g., public health innovation, medical device design, health information technology, etc.); Second, promoting project-based learning, i.e., driving with real or simulated clinical and health problems, where students autonomously form teams, determine research or innovation problems, and design solutions, with the teacher's role shifting from knowledge transmitter to process guide; Third, student-led innovation practice design, i.e., granting students autonomous decision-making power in the design, implementation rhythm, and presentation methods of innovation and entrepreneurship practices under the premise of ensuring medical ethics and patient safety bottom lines, avoiding excessive regulation of practice details by teachers or curricula. It is worth emphasizing that autonomy support does not imply a lack of teaching structure, but rather preserves sufficient self-determination space for students within clear boundary conditions (ethical norms, safety bottom lines, academic integrity), which aligns with the proposition of "structured autonomy support" in Self-Determination Theory (Reeve, 2009).

4.1.2 Competence Cultivation Element

The competence cultivation element aims to enable international medical students to continuously obtain the psychological experience of "I can do it" in the process of Professional-Innovation Integration practice through scientific ability progression design and timely and effective feedback mechanisms, thereby resisting the frustration and fear of difficulty caused by the long cycle and high threshold of medical innovation and entrepreneurship activities. Specifically, this element includes three levels: First, step-by-step ability construction, i.e., decomposing the cultivation of Professional-Innovation Integration abilities into several progressive ability levels (e.g., problem identification ability, literature retrieval and evidence evaluation ability, innovative solution design ability, achievement expression and transformation ability, etc.), enabling students to obtain challenging tasks matching their ability levels at each stage, avoiding competence frustration caused by "one-step" high-difficulty task design; Second, establishing a timely feedback mechanism, i.e., enabling students to promptly learn about their progress and shortcomings in innovation and entrepreneurship practice through formative assessment, phased achievement display, and personalized mentor guidance, rather than relying solely on summative assessment at the end of the semester; Third, visualization of innovation achievements, i.e., making students' phased innovation achievements visible through channels such as achievement exhibitions, innovation and entrepreneurship competitions, and cross-school exchange platforms, transforming abstract ability improvement into concretely perceptible achievement experiences.

4.1.3 Relatedness Connection Element

The relatedness element focuses on building strong teacher-student relationships, peer networks, and cross-cultural collaboration. These give international medical students a sense of belonging and emotional support during innovation and entrepreneurship practice, easing the alienation and reluctance to participate that language and cultural differences can create. Specifically, this element includes three levels: First, constructing a teacher-student community, i.e., encouraging teachers to participate in students' innovation and entrepreneurship practices as collaborators rather than mere evaluators, establishing trust bonds beyond mere knowledge transmission through regular communication and joint discussions; Second, building a cross-cultural peer learning network, i.e., creating opportunities for international medical students to deeply interact and cooperate with local students and other international students by forming mixed Chinese-foreign student teams and conducting cross-cultural innovation and entrepreneurship workshops, making innovation and entrepreneurship practice itself a carrier for establishing cross-cultural relationships; Third, expanding school-enterprise and international cooperation networks, i.e., relying on the cooperative relationships established by the school with medical institutions, enterprises, and international partner universities, providing international medical students with opportunities to contact real industry situations and international peers, expanding the breadth and depth of their relatedness connections, which also echoes the relevant work functions of the International Cooperation and Exchange Department of the students' universities.

4.2 Operational Mechanism of the Three Elements

The three elements of autonomy support, competence cultivation, and relatedness connection are not isolated from each other, but jointly promote the generation and reinforcement of learners' intrinsic motivation through a dynamically coupled feedback loop. Specifically, autonomy support provides the psychological starting point of self-determination for learners, making the effort invested in innovation and entrepreneurship practice perceived as "out of one's own will" rather than "external coercion"; on this basis, the step-by-step competence cultivation mechanism reinforces learners' belief that "self-chosen behaviors can lead to effective results" through continuous ability feedback, thereby further consolidating their willingness for autonomous participation. In contrast, the relatedness connection element provides emotional support and social capital for the above autonomous exploration and ability improvement process through teacher-student communities and cross-cultural peer networks, alleviating the psychological pressure caused by uncertainty and frustration in innovation and entrepreneurship practice. A positive spiral dynamic coupling relationship is formed among the three: autonomy support enhances participation engagement; increased engagement brings more opportunities for ability feedback; ability feedback strengthens competence; enhanced competence in turn boosts students' confidence in autonomous exploration; meanwhile, the emotional support provided by relatedness connection runs through the entire cycle, playing a regulating role in buffering frustration and maintaining participation persistence. When the three psychological needs are fully and coordinately satisfied, learners' motivation level will gradually transition from external regulation or introjected regulation to identified regulation and even intrinsic motivation, thereby realizing the motivation transformation from "I have to participate in Professional-Innovation Integration" to "I want to participate in Professional-Innovation Integration," which is the core mechanism of intrinsic motivation generation.

4.3 Practical Pathways of the Teaching Model

Based on the above analysis of element and mechanism analysis, this study proposes the following four practical pathways. First, the curriculum system reconstruction pathway. Medical colleges should embed Professional-Innovation Integration modules within the training programs for international medical students, rather than treating innovation and entrepreneurship education as an isolated elective appended to the medical curriculum. Instead, they should integrate professional knowledge with innovation and entrepreneurship skills by offering interdisciplinary project courses and workshops built around real clinical problems. They should also leave room in the curriculum for students to make their own choices.

Second, the teaching method and evaluation mode innovation pathway. Student-centered teaching methods such as project-based learning, case teaching, and flipped classrooms should be vigorously promoted, reducing the proportion of one-way knowledge indoctrination-style teaching in Professional-Innovation Integration courses; the evaluation mode should shift from a single summative assessment to a combination of formative and summative assessments, focusing on the multiple evaluations of students' innovative thinking, teamwork, and practical abilities, and strengthening students' competence experience through formative feedback.

Third, the faculty and international cooperation mechanism construction pathway. The construction of composite faculty with cross-cultural teaching ability and innovation and entrepreneurship practice experience should be strengthened, encouraging teachers to deeply participate in guiding students' innovation and entrepreneurship practices; meanwhile, relying on the school's International Cooperation and Exchange Department, the cooperation network with universities and medical institutions in source countries such as ASEAN countries should be expanded, providing a broader relatedness connection platform and practical resources for international medical students.

Fourth, special adaptation strategies in the context of foreign-related medical education. English or bilingual Professional-Innovation Integration teaching resources should be developed for the language and cultural backgrounds of international medical students. Under the premise of ensuring medical ethics and patient safety bottom lines, full consideration should be given to the characteristics of the medical and health systems and career development needs of the source countries, so that the themes of Professional-Innovation Integration practices can be effectively connected with the future career development paths of international medical students, thereby enhancing their sense of practical significance and internal identity in participating in Professional-Innovation Integration activities.

5. Discussion

5.1 Dialogue with SDT Theory

This study extends Self-Determination Theory from its established contexts of general education and sport psychology to the specific context of medical education, which is characterized by strong professional norms and ethical constraints, thereby further demonstrating the relevance of the three basic psychological needs framework in interdisciplinary and cross-cultural educational settings. At the same time, this study also reveals that in the context of medical Professional-Innovation Integration, which highly relies on professional knowledge and ethical norms, autonomy support cannot be simply understood as "complete

laissez-faire," but should be manifested as "structured autonomy support," i.e., preserving self-determination space for learners under clear boundary conditions. This finding enriches the contextualized understanding of the connotation of autonomy support in Self-Determination Theory.

5.2 Dialogue with Existing Literature

The findings of this study echo and expand upon existing Professional-Innovation Integration research. Existing studies emphasize the supporting role of external conditions, such as curriculum structures and platform development, in making Professional-Innovation Integration effective. For example, Huang Mingrui and Chen Yuan (2023) proposed that Professional-Innovation Integration curricula should be systematically integrated from dimensions such as objectives, concepts, content, methods, evaluation, and resources from the perspective of new engineering; Lu Zhuo and Wu Chunshang (2020) analyzed the theoretical logic, practical dilemmas, and breakthrough paths of Professional-Innovation Integration reform. This study does not deny the importance of external conditions; rather, it argues that whether these conditions lead to deep learner participation depends on whether they satisfy learners' psychological needs for autonomy, competence, and relatedness. This provides a new theoretical explanation for understanding the question of "why similar external condition constructions produce different teaching effects in different contexts," which has not been fully explained by existing research.

5.3 Theoretical Contributions

The theoretical contributions of this study are mainly reflected in two aspects: First, it systematically introduces Self-Determination Theory into the specific and special educational context of Professional-Innovation Integration teaching for international medical students, making up for the theoretical gap of "emphasizing external conditions while neglecting internal drive" in existing Professional-Innovation Integration research; Second, it proposes a three-level analysis framework of "Elements—Mechanisms—Paths," transforming abstract psychological needs theory into a logically practical-oriented teaching model construction logic, providing an analytical framework basis for subsequent theoretical deepening and empirical testing in related fields.

5.4 Practical Implications

This study has direct practical implications for medical colleges, especially local medical institutions undertaking the training of international medical students: Professional-Innovation Integration teaching reform should not stop at hardware condition construction such as curricula and platforms, but should pay more attention to whether instructional design can effectively meet learners' psychological needs for autonomy, competence, and relatedness; educational administrators and front-line teachers should consciously integrate specific measures to support the satisfaction of these three psychological needs in all links of curriculum design, teaching implementation, and evaluation feedback, thereby realizing the teaching reform transformation from external promotion to internal drive.

6. Conclusion

This study takes Self-Determination Theory as its theoretical foundation. It adopts a qualitative research paradigm to systematically elaborate the core elements, operational mechanisms, and practical pathways of the Professional-Innovation Integration teaching model for international medical students from the perspective of intrinsic motivation. The study argues that the three elements of autonomy support, competence cultivation, and relatedness connection jointly promote the generation of learners' intrinsic motivation through a dynamically coupled feedback mechanism, which is the key theoretical lever to solve practical dilemmas such as insufficient participation and weak innovation awareness in Professional-Innovation Integration teaching for international medical students. Based on this, this study suggests that medical colleges should systematically promote the four practical pathways of curriculum system reconstruction, the teaching method innovation, faculty and international cooperation mechanism construction, and adaptation strategies for foreign-related contexts in the reform of Professional-Innovation Integration teaching, realizing the transformation of teaching reform concept from external condition construction to internal motivation stimulation.

This study also has certain limitations. First, as a conceptual qualitative study with theoretical construction as its core interest, this study has not yet incorporated first-hand empirical data such as interviews and observations to verify the theoretical framework contextually. Subsequent research can draw on teaching-practice cases from specific institutions, using qualitative interviews and participant observation to empirically test and contextually refine the theoretical framework proposed in this study. Second, the teaching model proposed in this study is based mainly on general theoretical deduction and therefore gives insufficient attention to the possible differences in motivation structures among international medical students from different source countries and cultural backgrounds. Subsequent research can further refine our understanding of how the motivational characteristics of international medical students vary across regions. Future research can conduct longitudinal tracking studies based on the theoretical framework of this study, combined with the teaching reform practices of specific institutions, to further

test the long-term impact of the intrinsic motivation perspective on international medical students' learning engagement, innovation ability, and career development.

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