Exploring Motivations, Practices, and Evaluation of Virtual Internationalization in Traditional Chinese Medicine Higher Education: A Qualitative Case Study of Five Universities

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Abstract. In response to the evolving demands of global education and the rapid advancement of Information and Communication Technologies (ICT), Virtual Internationalization (VI) has emerged as a strategic approach in higher education. Traditional Chinese Medicine (TCM) universities face the dual challenge of preserving culturally embedded knowledge while aligning with global healthcare standards. Historically reliant on physical mobility, these institutions are increasingly adopting VI to maintain and enhance international engagement. This empirical research adopts a qualitative case study methodology to investigate the application of VI in five public TCM universities located in Beijing, Shanghai, Guangdong, Jiangxi, and Shaanxi provinces of China. Relying on institutional documents and reports, the empirical research explores: (1) key motivations for initiating VI, (2) the types of practices and digital tools employed, (3) evaluation methods currently in use, and (4) perceived areas for future improvement. Findings and data reveal drivers such as national policy incentives and the pursuit of international competitiveness, alongside practices like virtual exchanges and Collaborative Online International Learning (COIL). However, the absence of standardized assessment frameworks and insufficient digital infrastructure remain pressing challenges. By offering discipline-specific insights, this research contributes to the literature of VI in non-Western medical education and provides practical guidance for improving internationalization strategies of TCM higher education within a connected context globally.

Keywords: Virtual Internationalization; Information and Communication Technology; Traditional Chinese Medicine; higher education; qualitative case study

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1. Introduction

In the context of globalization and digital transformation, the internationalization of Traditional Chinese Medicine (TCM) in higher education has been undergoing a paradigm shift. Public TCM universities in China have traditionally welcomed international students and forged global collaborations as part of the country's broader effort to promote TCM worldwide (Guo, 2024). The Chinese government has supported this goal by establishing more than 30 overseas TCM centers in countries such as Russia, Thailand, and Hungary (Gong & Yan, 2024). These efforts align with national strategies like the Belt and Road Initiative, which promotes the global dissemination of TCM education and healthcare services (State Administration of Traditional Chinese Medicine, 2022).

However, rising travel costs, geopolitical tensions, and the widespread disruptions caused by the COVID-19 pandemic have significantly reduced the feasibility of traditional, mobility-based international programs (Marinoni & Jensen, 2020). In response, public TCM universities have begun to explore virtual alternatives to maintain their global engagement. This shift is consistent with broader national policy directions encouraging digital innovation in higher education.

Virtual Internationalization (VI) refers to the use of digital technologies to support cross-border academic interaction. It includes online collaborative learning (e.g., COIL), digital mobility programs, and virtual partnerships (O'Dowd, 2020). Rather than relying solely on physical exchanges, universities now use online platforms, virtual classrooms, and remote international projects to sustain and expand their global connections. The COVID-19 pandemic acted as a global catalyst for this transformation, and Chinese TCM universities are now part of this trend.

While VI has opened new pathways for international engagement, there is still a lack of research on how it is implemented in the context of TCM higher education. Existing studies focus mostly on general higher education settings or Western medical schools. They often overlook the unique characteristics, cultural expectations, and teaching traditions of TCM education (Zhou, 2022). Moreover, the Chinese government has issued new guidelines to promote digital internationalization in TCM, making it urgent to investigate how universities are adapting to these national goals. Without timely and targeted research, institutions risk falling behind in both policy alignment and global competitiveness.

Although some TCM universities have started implementing VI initiatives, many institutions have yet to adopt such strategies, and relevant research remains scarce and fragmented. To address this gap, the present study adopts a qualitative case study approach, focusing on five public TCM universities in China that are actively exploring VI. It aims to examine the motivations behind VI adoption, the practices and tools used, the evaluation frameworks applied, and practical strategies for improvement. The research provides insights into how traditional, culturally rooted disciplines like TCM are engaging with internationalization in a

digital era. Accordingly, the research is structured around the following key questions:

RQ1 (Motivations):
What are the key motivations driving Traditional Chinese Medicine (TCM) universities to implement Virtual Internationalization initiatives?

RQ2 (Practices):
What types of Virtual Internationalization practices and technological tools have been adopted by the selected TCM universities?

RQ3 (Evaluation):
What frameworks or evaluation scales are used to assess the effectiveness of Virtual Internationalization initiatives in TCM universities?

RQ4 (Recommendations):
What practical strategies and recommendations can be proposed to enhance future Virtual Internationalization practices in TCM higher education?

The findings aim to shed light mainly on educators and administrators in TCM on best practices and challenges when extending their curriculum and collaborations beyond borders through virtual means.

2. Literature Review
This section outlines key developments in Virtual Internationalization (VI), highlighting its conceptual basis, broader application in higher education, and the limited yet emerging research in the context of Traditional Chinese Medicine (TCM) universities.

2.1 Concept of Virtual Internationalization
Mittelmeier et al. (2021) introduce the concept of Virtual Internationalization as a third category alongside Internationalization at Home (IaH) and Internationalization Abroad (IA), which utilizes digital tools to bring international learning to the home institution. VI environments utilize local people and technologies as infrastructures, allowing international collaboration without moving abroad (Breines et al., 2019), providing students staying at home country with new types of materials, pedagogical approaches and activities from a host institution located abroad. This evolution reflects a shift towards more inclusive and technologically integrated approaches to internationalization, aiming to provide global learning opportunities to a broader student population.

Virtual Internationalization (VI) initially emerged as a creative solution to the financial constraints, political uncertainties, and logistical challenges that often hinder traditional modes of international engagement. Over time, it has gained recognition as a strategic approach for cultivating global competencies among both students and academic staff (De Wit et al., 2020). The outbreak of the COVID-19 pandemic significantly accelerated the uptake of VI practices, highlighting their capacity to maintain cross-border academic interaction despite severe travel limitations (Marinoni et al., 2020). What began as a crisis-driven adaptation has since evolved into a core—or in some cases, primary—component of

internationalization policies adopted by universities around the world (Beelen & Jones, 2015).

2.2 Virtual Internationalization in Higher Education

Across the broader landscape of higher education, Virtual Internationalization (VI) has increasingly been embedded into academic programs through initiatives such as Collaborative Online International Learning (COIL), remote research partnerships, and globally oriented webinars. These approaches allow students to engage in intercultural learning without leaving their home institutions (O'Dowd & Beelen, 2021). Prior research has documented a range of benefits associated with VI, including enhanced accessibility, cost efficiency, the development of intercultural competencies, and the broadening of global learning participation (Alcoba & La-Ongsri, 2024).

Yet, despite these advantages, a number of obstacles continue to hinder the full realization of VI's potential. These include disparities in technological access, mismatched academic calendars across regions, insufficient training for faculty, and uneven levels of institutional commitment (Baroni et al., 2019). Such challenges point to the critical need for thoughtful institutional planning, robust digital infrastructure, and sustained professional development support for educators involved in VI efforts.

2.3 Virtual Internationalization in Traditional Chinese Medicine (TCM) Universities

In the context of Traditional Chinese Medicine (TCM) higher education, internationalization has historically centered on physical mobility—manifested through student exchanges, overseas training programs, and collaborative international research (Fu et al., 2024). In recent years, however, a gradual transition toward virtual modes of global engagement has begun to take shape. One example is the "Chinese Bridge" Online Group Exchange Project, initiated by Changchun University of Chinese Medicine (CCCM), which illustrates how digital platforms are being utilized to facilitate cross-border academic interaction (CCCM, 2023).

Despite these emerging practices, scholarly attention to Virtual Internationalization (VI) within TCM education remains limited. Much of the existing literature continues to emphasize traditional internationalization pathways, often overlooking the distinctive opportunities and constraints associated with virtual environments (Liu & Yang, 2021). This oversight underscores the importance of dedicated research examining how TCM universities conceptualize, operationalize, and evaluate VI as part of their broader internationalization strategies.

Furthermore, existing VI practices in TCM universities remain fragmented and exploratory, often lacking long-term institutional support or integration into formal curricula. Many initiatives are project-based, driven by individual faculty or short-term funding schemes, rather than embedded in strategic internationalization planning (Hou, 2025; Yi, 2025; Zhao, 2025). The absence of centralized frameworks has led to considerable variation in objectives, delivery

models, and quality assurance mechanisms across institutions. Additionally, faculty members often face difficulties in adapting traditional teaching content for virtual platforms, particularly when conveying experiential or practice-based knowledge. These implementation challenges underscore the need for deeper inquiry into how TCM universities develop sustainable, pedagogically coherent, and culturally grounded models of Virtual Internationalization.

2.4 Research Gaps

Despite growing scholarly attention to Virtual Internationalization (VI) in general higher education, research focused on its application in Traditional Chinese Medicine (TCM) universities remains limited. Most studies to date adopt broad institutional perspectives and do not sufficiently consider the pedagogical and epistemological distinctiveness of TCM education. Unlike Western medical education—which often integrates virtual simulation, case-based learning, and standardized global curricula—TCM pedagogy is rooted in classical theories, tacit diagnostic practices, and master-apprentice transmission models. These foundational differences complicate the implementation of Virtual Internationalization, especially in areas such as experiential learning, clinical judgment training, and cultural preservation.

Existing frameworks for evaluating VI tend to prioritize participation metrics and student satisfaction, overlooking culturally embedded competencies that are central to TCM. Moreover, few studies have examined how TCM universities conceptualize, implement, and assess VI in ways that align with their disciplinary identity and national strategic roles. This study addresses these gaps by conducting a cross-regional case analysis of five public TCM universities in China, offering a framework that is both theoretically grounded and contextually sensitive. By foregrounding the unique tensions and opportunities facing TCM institutions, this research contributes an original, field-specific perspective to the literature on Virtual Internationalization in specialized and culturally embedded disciplines.

3. Research Methodology

This section outlines the methodological approach used to investigate how Virtual Internationalization (VI) is applied in TCM universities. It details the research design, case selection, data collection procedures, and analytical strategies adopted to ensure the study's rigor and relevance.

3.1 Research Design

This research employs a qualitative case study design to examine how Virtual Internationalization (VI) is being implemented across selected Traditional Chinese Medicine (TCM) universities. As noted by Yin (2017), the case study approach is particularly effective when exploring contemporary issues situated in real-world settings, especially where the distinction between the phenomenon and its context is not quite apparent. By closely analyzing institutional policies, implemented initiatives, and observable outcomes, this study aims to generate insights into the driving factors, operational practices, encountered obstacles, and emerging models of VI within the landscape of TCM higher education.

3.2 Case Selection

The selected institutions included in this study were purposefully chosen based on three key criteria. First, each university must offer accredited undergraduate or postgraduate programs in Traditional Chinese Medicine. Second, the institution must have implemented Virtual Internationalization (VI) initiatives during or after the onset of the COVID-19 pandemic. Third, to ensure a more representative perspective on VI implementation across varying institutional settings, the sample reflects diversity in both geographical location and institutional scale.

Preliminary information regarding VI activities was obtained through university websites, published reports, and publicly available documents. Based on the above criteria, five representative TCM universities, namely Beijing University of Chinese Medicine (BUCM), Guangzhou University of Chinese Medicine (GUCM), Shaanxi University of Chinese Medicine (SUCM), Shanghai University of Traditional Chinese Medicine (SHUTCM) and Jiangxi University of Chinese Medicine (JXUCM) were selected purposively for their active engagement in internationalization and geographic diversity.

BUCM (Beijing), GUCM (Guangzhou) and SHUTCM (Shanghai) are Double First-Class universities among the top-tier TCM universities with extensive international networks, JXUCM (Jiangxi) represents a growing tertiary institution that has made significant progress in internationalization, despite being located in a less prominent region, while SUCM (Shaanxi) represents a relatively underdeveloped level of internationalization in Western China.

3.3 Data Collection

Data was gathered from multiple sources to ensure a rich and triangulated understanding of each case: Institutional Policies and Documents & Websites: official university announcements, news releases, partnership agreements and web pages (especially international cooperation offices and international education colleges) related to Virtual Internationalization initiatives. For example, BUCM's English news portal provided detailed reports of online symposiums with foreign partners during COVID-19 (BUCM, 2020a). JXUCM's international office website was examined for more relevant information on partnerships (like Confucius Institutes, joint programs) and any online activities. The research also consulted press releases and partner university websites for collaboration details (e.g., an announcement by the University of Lisbon about a joint online-offline TCM training program with JXUCM (University of Lisbon, 2024)

To contextualize and evaluate practices, the study reviewed literature on internationalization of TCM education and virtual exchange. This included published case studies, government reports, and prior research. For instance, Fang and Wang (2019) offered valuable insights into the internationalization of TCM education within the context of the Belt and Road Initiative. Additionally, this research referenced broader literature on virtual exchange and related evaluation toolkits to inform the selection of appropriate assessment frameworks (Stevens, 2019).

3.4 Data Analysis

Using the research questions as a guiding framework, this study employed a thematic analysis approach to examine the qualitative data collected from institutional documents, official websites, virtual program descriptions, and relevant policy reports across the five selected universities: BUCM, GUCM, SHUTCM, SUCM and JXUCM. Thematic analysis followed Braun and Clarke's (2006) six-phase methodology, including familiarization with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final narrative (see Figure 1).
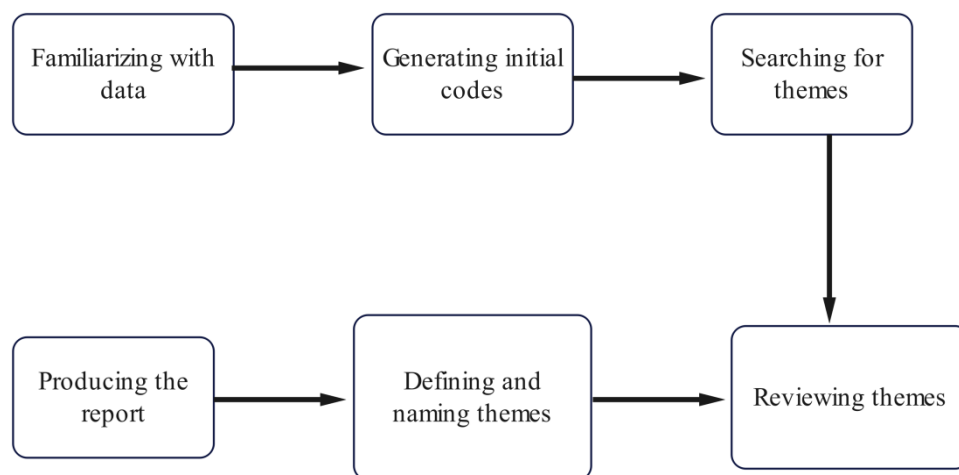
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Familiarizing with data  →  Generating initial codes  →  Searching for themes
                                                                   ↓
Producing the report  →  Defining and naming themes  →  Reviewing themes
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Figure 1: Phases of thematic analysis (Braun & Clarke, 2006)

The data were coded manually using both deductive and inductive strategies. Four overarching themes were pre-identified based on the research questions. Within each theme, specific instances and patterns were extracted and categorized. To ensure reliability in the analysis process, coding was conducted iteratively, and theme definitions were refined through memo-writing and continuous comparison.

Following the individual thematic analysis, a cross-case synthesis was performed to compare and contrast how each institution approached Virtual Internationalization. This synthesis was informed by the comparative logic proposed by Miles and Huberman (1994), enabling identification of convergent and divergent practices across cases. A comparative matrix was constructed (see Table 1 below) to summarize key initiatives, technological tools, and evaluation strategies adopted by each university. This analytical process facilitated a deeper understanding of both the commonalities and contextual specificities in how public TCM universities in China implement Virtual Internationalization strategies.

Table 1: Virtual Internationalization practices in TCM universities

University	Virtual project	Function	Reference
Beijing University of Chinese Medicine	Virtual TCM hubs in Russia, U.S., Australia. VR drama 'Qihuang Zhi' at UNESCO. Joint Degree: Hybrid master's with Univ. of Barcelona.	Three-dimensional support system; ISO standardization leadership.	(BUCM, 2020c)
Shanghai University of Traditional Chinese Medicine	AI-assisted diagnosis with tongue/pulse with French hospital. VR Clinical Training. Blockchain for IP protection in TCM collaboration.	Innovation in diagnostics and IP security via emerging technologies.	(SHUTCM, 2023)
Guangzhou University of Chinese Medicine	MOOC Alliance: Bilingual courses with HKBU. Cloud Labs: Antiviral herb research with NUS.	TCM+X: Tourism, e-sports for global engagement.	(GUCM, 2023)
Jiangxi University of Traditional Chinese Medicine	Hybrid Classes 'Sino-British Marketing' Program with livestreamed case competitions. VR Acupuncture Simulator with multi-language feedback systems.	Call for transnational quality assessment systems.	(Sun et al., 2023)
Shaanxi University of Chinese Medicine	"Digital Silk Road TCM" cloud lectures with Kazakhstan, Kyrgyzstan, and Belarus. AI-powered multilingual chatbot for TCM terminology learning. Cross-border collaborative MOOC	Promotes cultural diplomacy along Belt and Road. Enhances student engagement and accessibility. Fosters multilingual international classroom with co-teaching model.	(Yin & Ma, 2025)

According to Table 1, BUCM leads in strategic global engagement through its establishment of virtual TCM hubs across continents and participation in international multimedia projects such as the VR drama Qihuang Zhi, aligning with UNESCO's cultural diplomacy efforts (BUCM, 2020c). Similarly, SHUTCM integrates cutting-edge technologies like blockchain for TCM intellectual property protection and AI-based diagnostics in collaboration with French medical institutions (SHUTCM, 2023). GUCM emphasizes cross-border educational accessibility through bilingual MOOCs and internationalized cloud labs, merging TCM with emerging sectors such as e-sports and tourism (GUCM, 2023).

JXUTCM stands out with practice-oriented programs, including livestreamed cross-border case competitions and a multilingual VR acupuncture simulator, while also advocating for transnational quality assurance mechanisms (Sun et al., 2023) . SXUCM, meanwhile, has taken a regionally collaborative approach via the "Digital Silk Road TCM" initiative, offering cloud-based lectures with Belt and

Road partner countries, and utilizing AI-powered multilingual chatbots to enhance international learner engagement (Yin & Ma, 2025).

These diverse initiatives illustrate that while all five institutions were engaged in VI through technological means, their strategies are shaped by differing institutional missions, geographic priorities, and levels of internationalization maturity. Notably, the integration of VR, AI, and MOOC platforms reflects a broader trend in TCM higher education toward pedagogical innovation and global reach, as emphasized by recent calls for more inclusive, digitally enabled internationalization pathways (Gutiérrez-González et al., 2023; Wächter, 2020).

3.5 Trustworthiness and Ethical Considerations

To enhance the trustworthiness of the findings, this study employed triangulation by analyzing data from multiple institutional sources, including official university websites, strategic reports, and government policy documents. Cross-source comparison was used to ensure consistency and reduce interpretation bias. Member checking was not conducted, as the study did not involve interviews or participant-based data.

The research design relied solely on publicly available materials. No interviews, surveys, or direct interaction with individuals were conducted. This decision was made to focus on institutional-level practices and strategies, which are often documented in formal reports and policies.

Ethical approval was not required, as the data used was already in the public domain and did not involve any personal or sensitive information. Nonetheless, careful attention was given to the responsible use of institutional data, including anonymizing university identifiers during cross-case analysis where appropriate, to avoid unintended reputational implications

4. Results

This section summarizes the key findings from the case study analysis, organized around the four research questions. It examines the motivations, practices, evaluation mechanisms, and strategic recommendations related to Virtual Internationalization (VI) within selected TCM universities, drawing on institutional data and cross-case comparisons.

4.1 Motivations for Virtual Internationalization in TCM Universities

One key motivation for implementing Virtual Internationalization in TCM universities is the aim to expand the global presence of Traditional Chinese Medicine. With TCM now recognized in 196 countries and over 300,000 practitioners worldwide (Guo, 2024), Chinese universities see international dissemination of TCM knowledge as part of their strategic mission. This effort aligns with China's broader goals of soft power and cultural exchange. National policies, such as the Belt and Road Initiative, explicitly support TCM cooperation.

For instance, the National Administration of Traditional Chinese Medicine launched a plan in 2024 to train 1,300 overseas health professionals in TCM over three years (NATCM, 2022). Public TCM universities play a leading role in this initiative, using virtual platforms to deliver large-scale training to participants across Asia, Africa, and Europe. In this context, supportive government policies and funding incentives strongly encourage universities to develop innovative online programs for global engagement.

The COVID-19 pandemic was a key driver of Virtual Internationalization in TCM universities. With travel bans halting student exchanges and in-person collaborations, institutions were forced to act quickly to ensure educational continuity for international students and to share their expertise on COVID-19 treatment globally. Many universities transitioned to online teaching within weeks (Zhang et al., 2020).

For instance, Zhejiang University moved its "Basic TCM" course for MBBS students online in early 2020 (Zhang et al., 2020). Students accessed live streamed or recorded lectures via platforms such as the university's Learning Management System (LMS) and DingTalk (a communication and online teaching tool). At the same time, universities recognized the need for global dialogue. Beijing University of Chinese Medicine (BUCM) emphasized international cooperation in combating COVID-19, hosting virtual symposiums with partners in Italy, Canada, and South Africa (BUCM, 2020c). The pandemic not only posed a challenge but also revealed the value of digital tools in fulfilling international responsibilities.

Virtual Internationalization also aims to make TCM education accessible to students who cannot study in China. Online programs, such as MOOCs and certificate courses, help universities reach global learners, including working professionals and those limited by cost or geography. For example, Shanghai TCM University (SHTCM) developed MOOCs in acupuncture and tuina for students at the University of Ottawa, the University of Lyon, and Shanghai Jiaotong (SHTCM, 2020). Virtual Internationalization also aims to make TCM education accessible to students who cannot study in China. Online programs, such as MOOCs and certificate courses, help universities reach global learners, including working professionals and those limited by cost or geography. For example, Shanghai TCM University (SHTCM) developed MOOCs in acupuncture and tuina for students at the University of Ottawa, the University of Lyon, and Shanghai Jiaotong.

Virtual engagement helps TCM universities enhance their international reputation and visibility. Leading institutions use global webinars and online programs to showcase expertise and foster international partnerships (Altbach & De Wit, 2018; Knight, 2020). These initiatives also support student recruitment, as online exposure introduces potential applicants to a university's programs (Qin & Teichler, 2021). Jiangxi University of Chinese Medicine (JXUCM), for example, builds its overseas presence through digital outreach and collaborations such as the Portugal exchange and its Confucius Institute in South Korea. For smaller or less-resourced universities, Virtual Internationalization offers a cost-effective entry point to global engagement, without needing to establish physical campuses

or offer scholarships (Zhou, 2022). Overall, motivations for Virtual Internationalization span national strategies, institutional goals, and post-pandemic realities, underscoring the long-term value of digital platforms in expanding TCM's global influence (Huang et al., 2022; Marginson, 2021).

4.2 Types of Virtual Internationalization Practices in TCM Universities
The case study also analyses quite wide range of practical strategies and tools that BUCM, GUCM, SUCM, SHUTCM and JXUTCM have employed to implement Virtual Internationalization. These strategies can be grouped into a few categories:

During the COVID-19 pandemic, virtual knowledge exchange became central to international engagement. Beijing University of Chinese Medicine (BUCM) hosted several high-profile online symposiums, such as a joint forum with Sapienza University of Rome on May 22, 2020, focusing on the role of TCM in COVID-19 treatment (BUCM, 2020a). and another with the Canada-China Science Association, featuring experts from BUCM, the University of Toronto, and the University of Montreal (BUCM, 2020b).

These events used platforms like Zoom and Tencent Meeting for real-time sharing. Similarly, GUCM participated in the "Sino-Australia COVID-19 Partnership" webinar series, presenting TCM research to Australian counterparts. These experiences demonstrated the effectiveness of virtual conferences for timely international collaboration, even beyond COVID-related topics.

Beyond emergency responses, TCM universities also expanded academic exchanges through online workshops and virtual teaching. For instance, GUCM utilized its Confucius Institute at London South Bank University to offer online TCM seminars featuring live demonstrations, slides, and real-time interpretation (London South Bank University, 2025). Likewise, JXUCM hosted an online session via Zoom in late 2024, introducing a plant-based medicine training program co-developed with the University of Lisbon (University of Lisbon, 2024).

Virtual education programs have also grown rapidly. Between 2020 and 2021, international courses were offered via platforms like DingTalk, Tencent Classroom, and Moodle. Faculties adapted practical TCM instruction using 3D software, video demonstrations, and online assessments. These efforts, though initially temporary, have laid the groundwork for long-term online offerings. For example, SHUTCM launched a Chinese-French MOOC series to reach learners abroad (SHUTCM, 2022).

Some traditional exchange programs shifted online. GUCM offered a virtual summer camp in 2021, replacing its in-person Thai student exchange. The camp included pre-recorded lab tours, live-streamed TCM theory lectures, and webcam-guided Tai Chi and Baduanjin practice sessions. Even cultural elements, such as calligraphy classes and a virtual campus tour, were included to simulate the on-site experience (Ge, 2015). Positive feedback led to the continuation of virtual options alongside in-person exchanges.

In terms of joint teaching and research, virtual platforms have increased international collaboration. BUCM invited guest professors to deliver lectures remotely—such as a clinical trial expert from the University of California presenting via Zoom—while BUCM faculty also taught in programs abroad, such as the University of Johannesburg's Master's in Acupuncture program (Gong & Yan, 2024). At the research level, GUCM partnered with institutions in Poland and the UAE through the Belt and Road TCM Alliance to establish a "TCM Digital Innovation Lab." These joint laboratories enabled remote collaboration on acupuncture research, shared clinical data via cloud platforms, and allowed for collective data analysis and experiment design (GZUM, 2021).

4.3 Frameworks or Evaluation Scales Used
To better understand the evaluation practices in place, Table 2 presents a summary of key methods adopted by TCM universities for assessing VI initiatives.

Table 2: Frameworks or evaluation of VI in TCM universities

Evaluation Method	University/Program	Key Features and Issues	Reference
Feedback from online collaborative learning	General	Various forms implemented but lack standardization; fragmented application without long-term tracking	(Shaoshuai & Sukumaran, 2024)
Exam performance comparison + teacher reflection	Beijing University of Chinese Medicine (BUCM)	No significant loss in theoretical knowledge; practical skills hard to assess remotely	(Ge, 2015)
Module-based surveys + onsite skills assessment	Jiangxi University of Chinese Medicine & Lisbon program	Combines virtual and in-person training; focuses on experience feedback; lacks holistic evaluation model	Program documentation
Likert-scale COIL evaluation	Not specified	Captures intercultural learning perception; mostly descriptive; lacks standardized tools	(Kobzhev et al., 2020)
Annual internationalization report (quantitative)	Multiple universities	Focus on metrics such as sessions, participants, partners; lacks depth or educational impact analysis	(Wu, 2019)
IDI, GPI, COIL Rubrics (international standards)	Higher education (general)	Widely used for global competence evaluation; not yet adopted in TCM universities	(Baroni et al., 2019)

Mixed methods (survey + interview + class observation)	Selected universities	Combines qualitative and quantitative data; enhances depth; still limited in practice	(Stevens, 2019)
Informal tools (surveys/reflection)	General	Exploratory phase: flexible format but lacks formalized mechanisms	(Xiao et al., 2024)

Evaluation of Virtual Internationalization (VI) in Traditional Chinese Medicine (TCM) universities remains at a burgeoning stage, with most institutions lacking systematic and discipline-specific assessment frameworks (Fu et al., 2024; Irele, 2013). Current evaluation practices rely heavily on informal tools such as feedback surveys, reflection notes, and exam performance comparisons, often applied inconsistently and without long-term tracking (Shaoshuai & Sukumaran, 2024). While these tools offer some immediate insights into students' engagement, they lack the rigor and depth required for robust assessment of international learning outcomes.

Although a few universities have experimented with mixed-method evaluations or integrated VI indicators into annual reporting, the use of standardized tools—such as the Intercultural Development Inventory (IDI) or Global Perspectives Inventory (GPI)—remains rare in the TCM context (Baroni et al., 2019). Importantly, these widely used instruments may not adequately capture the cultural specificity or clinical orientation central to TCM education. For example, the IDI focuses heavily on intercultural sensitivity but fails to reflect students' competence in navigating traditional Chinese cultural frameworks or engaging in virtual clinical simulations.

Moreover, current frameworks tend to emphasize general educational outcomes rather than those grounded in the epistemologies and pedagogical practices unique to TCM. As a result, evaluations risk overlooking key indicators such as cultural medicine literacy, virtual diagnostic reasoning, or cross-border herbal pharmacology discussions. In conclusion, there is a pressing need for more context-sensitive, longitudinal, and pedagogically aligned evaluation models. Future frameworks should not only assess generic international competencies but also integrate the disciplinary logics of TCM, thereby ensuring more valid and actionable assessment of VI in this specialized field.

4.4 Recommendations for Advancing Virtual Internationalization
Based on the practices of five selected TCM universities and the analysis demonstrated above, the research proposes several practical recommendations to strengthen Virtual Internationalization in TCM higher education.

First, institutions should invest in dedicated infrastructure to support virtual activities. This includes building smart classrooms equipped for hybrid teaching, subscribing to stable international webinar platforms, and providing professional video-recording studios. A technical support team is also essential to handle live translation, connectivity issues, and faculty training. These investments can

ensure high-quality delivery of virtual programs and improve the student learning experience(Chen et al., 2022).

Second, faculty development is key. Universities should offer targeted training in virtual pedagogy and intercultural communication. Sharing best practices—such as interactive tools for TCM demonstration—can improve teaching effectiveness. Recognition through teaching awards or promotion criteria can further motivate faculty engagement in international online programs (Abdelghaffar & Eid, 2025; Steele, 2025).

Third, students also require structured preparation and support. Pre-program orientation can include training in cross-cultural skills, software use, and basic language tools. Institutions should ensure students have access to proper hardware and consider time zone differences when scheduling. Mental health resources should be in place, particularly for international students facing online learning fatigue or isolation.

Fourth, universities are encouraged to formalize virtual partnerships through Memoranda of Understanding (MOUs) that include specific clauses on online collaboration. A proposed "Virtual TCM Education Alliance" among China's 23 TCM universities and international partners could promote shared course development, credit exchange, and annual online conferences (Kao et al., 2023) Such networks reduce resource burdens and expand learning opportunities for students—for example, a student from JXUTCM might earn credits by taking an online elective from BUCM .

Finally, a robust evaluation system is needed to guide continuous improvement. Institutions or alliances can adopt shared toolkits with survey templates, focus group guides, and key performance indicators (KPIs), such as the percentage of students participating in virtual exchanges or the number of online international events per year. These tools can help track progress and identify areas for enhancement—for example, improving English terminology support if students struggle with TCM-specific terms.

By adopting these strategies, TCM universities can not only sustain but enrich their Virtual Internationalization efforts. As seen in the cases of BUCM, GUCM, and JXUCM, the shift to virtual models—originally driven by necessity—has evolved into a long-term opportunity. A thoughtful integration of virtual and physical modalities will enable more global learners to access TCM education, while offering Chinese students and faculty meaningful international exposure. This blended approach supports both educational quality and the enduring mission of TCM: to teach, to heal, and to connect across borders.

5. Discussion
This section interprets the findings based on the four research questions and situates them within the broader literature on Virtual Internationalization (VI) and Traditional Chinese Medicine (TCM) higher education. It highlights institutional motivations, implementation practices, evaluation gaps, and strategic directions for advancing VI in TCM contexts.

5.1 Motivations for Implementing Virtual Internationalization
The adoption of VI in TCM universities is shaped by both external pressures and internal goals. National strategies—such as the "Double First-Class" initiative and Belt and Road agenda—encourage institutions to engage in virtual collaboration, aligning with prior studies emphasizing VI's strategic role in raising institutional visibility and fostering intercultural learning (De Wit et al., 2020; O'Dowd, 2020). Internally, universities pursue VI as a cost-effective alternative to physical mobility, particularly in the wake of the COVID-19 pandemic. Leaders view VI as a means to internationalize Chinese medicine, build global reputation, and enhance students' intercultural competencies (O'Dowd & Beelen, 2021). However, motivation levels vary depending on institutional capacity and leadership commitment.

5.2 Practices and Technological Tools Adopted
TCM universities employ practices such as COIL courses, live-streamed lectures, and virtual workshops. Examples like JXUCM's herbal COIL with Malaysia and GUCM's virtual laboratory with Poland and the UAE reflect early-stage but promising efforts. These initiatives, however, remain project-based and are not yet integrated into core curricula. Technology adoption leans on familiar platforms but lacks pedagogical innovation, with a continued emphasis on cultural display over collaborative knowledge exchange.

5.3 Evaluation Frameworks and Gaps
A key challenge is the absence of evaluation models suited to TCM's pedagogical and cultural context. Existing VI assessments focus on participation and satisfaction, missing elements like intercultural development and virtual clinical learning (Ye, 2023). Some institutions are experimenting with mixed methods, including interviews and reflective logs, yet no validated framework exists. This reflects a broader issue in VI research: the application of general metrics without addressing disciplinary uniqueness (Beelen & Jones, 2015; Stevens Initiative, 2021).

5.4 Practical Strategies and Policy Recommendations
The study proposes institutionalizing VI within curriculum planning, developing context-aware evaluation tools, training faculty in digital pedagogy, and fostering long-term partnerships. These align with earlier literature emphasizing sustainable and reciprocal VI approaches (Baroni et al., 2019; O'Dowd & Beelen, 2021). Embedding VI into institutional strategy and investing in faculty development are key to ensuring pedagogically meaningful and culturally relevant engagement.

Furthermore, the role of national-level policy frameworks in supporting VI implementation is crucial. Institutions such as the National Administration of Traditional Chinese Medicine (SATCM) can facilitate international standardization, support multilingual digital resource development, and coordinate regional partnerships aligned with the Belt and Road Initiative. These efforts would enhance the credibility and consistency of TCM education delivered virtually.

Global access to TCM education also depends on overcoming persistent barriers such as language differences, lack of accreditation mechanisms for online TCM programs, and uneven digital infrastructure across partner regions. Addressing these requires coordinated actions, including international curriculum co-design, cross-border accreditation agreements, and investment in open-access platforms. Ensuring equitable access means designing VI programs that not only showcase cultural heritage but also engage learners from diverse regions in meaningful, sustainable, and pedagogically sound ways.

5.5 Study Limitations
This study is limited by its focus on a small number of TCM universities, which may affect generalizability. The reliance on publicly available data restricted analytical depth, and the early-stage nature of VI initiatives limits insight into long-term impacts. Future research should adopt longitudinal and mixed-method designs, broaden the sample, and explore academic, professional, and intercultural outcomes over time.

5.6 Theoretical Contributions
This study adds to the literature on Virtual Internationalization by exploring how VI applies in the context of Traditional Chinese Medicine (TCM) education. Most VI frameworks are based on Western higher education, where standardization and digital tools are widely used. However, these models do not fully fit the teaching traditions of TCM, which rely on experience, personal guidance, and classical knowledge. The findings show that applying VI in TCM requires more flexible and culturally appropriate approaches. By focusing on a discipline with deep cultural roots, this study highlights the need to adjust existing VI theories to suit different fields. It provides new insights into how traditional knowledge systems and modern internationalization strategies can be better aligned.

6. Conclusion
This study examined how Virtual Internationalization (VI) is being implemented in Traditional Chinese Medicine (TCM) universities using a qualitative case study methodology. Framed by four central research questions, it explored the motivations for VI, the practices and digital tools adopted, the evaluation mechanisms in place, and practical strategies for strengthening VI in TCM higher education (Fedorchenko et al., 2024).

The findings indicate that TCM institutions are increasingly adopting VI to sustain international engagement, foster intercultural competencies, and enhance competitiveness in an evolving digital landscape. While several promising practices have emerged, key challenges persist, including infrastructural limitations, insufficient faculty training, and the lack of comprehensive assessment systems (Fedorchenko et al., 2024; Shaoshuai & Sukumaran, 2024).

To address these challenges, TCM universities are advised to invest in dedicated digital infrastructure, offer professional development for faculty, and establish sustainable virtual partnerships with international institutions. Strategic planning, leadership support, and the development of rigorous evaluation frameworks are also essential for the long-term success of VI initiatives (Mananay

et al., 2024; Shaoshuai & Sukumaran, 2024). Despite the study's limitations—such as a small sample size, reliance on qualitative data, and the early stage of many VI initiatives—it offers valuable insights into a traditionally underexplored area of international education. Future research should adopt broader institutional samples, employ longitudinal designs, and examine how emerging technologies can further support VI in TCM and other health education fields (Fu et al., 2024). Pursuing these directions will allow TCM institutions to better prepare globally competent graduates and promote the international visibility of Traditional Chinese Medicine in the digital age.

7. References

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