ORIGINAL RESEARCH

Bridging language and medical education: Integrating Chinese and Western perspectives for high-quality healthcare training

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Abstract

For exploring the integration of language and high-quality medical education with Chinese and Western medical perspectives in support of China's 14th Five-Year Plan for educational reform, this research assesses the potential and challenges of integrative medical education and examines the impact of incorporating a language education intervention through corpus-assisted approach on enhancing students' critical engagement with medical discourses and their communicative competencies in simulated clinical settings. Adopting a conceptual framework that places Critical Discourse Analysis (CDA) within the constructivist framework and using a mixed method design that combines questionnaire, focused group interviews, language intervention experiments and patient care simulation evaluations, this study reveals how a language education trial can significantly contribute to students' understanding of medical discourse, cultivation of cultural awareness, and enhancement in communication skills. The findings demonstrate the bridging of language education and medical training and propose an integrative medical educational approach for competent healthcare provision in an increasingly interconnected world.

Keywords medical education; critical discourse analysis; language education intervention; communication skills

1. Introduction

The Central Committee of the Communist Party of China's 14th Five-Year Plan for National Economic and Social Development underscores the imperative for high-quality education that fortifies a strategic developmental trajectory towards 2035, particularly within the healthcare sector. In this context, the confluence of Chinese and Western medical teachings is instrumental in augmenting medical education and the comprehensive grooming of healthcare practitioners (Peng & Gong, 2022). In the intersection of diverse healing paradigms, medical traditions embody the distinct bodies of knowledge, practices, and philosophies inherent to cultural or historical health systems, exemplified by the holistic approaches of Chinese medicine juxtaposed with the empirically-driven methods of Western medicine. Utilizing a mixed method approach and multiple sources of quantitative and qualitative data including questionnaire, focused group interviews, language education intervention experiments and simulated patient care practice performance, the current study also pays particular attention towards the effectiveness of the implementation of the *MediSync Corpus*, a corpus-assisted learning tool drawing from *New York Times*, in fostering students' CDA skills for critical analysis and evaluation towards the representation of medical treatments in media narratives through pre- and post-

intervention assessments along with patient care simulations.

The current study explores the pedagogical implications of language education in integrative medical education by emphasizing the importance of students' critical engagement with medical texts from different cultures for the enhancement of communicative skills and cultural literacy, which are essential for modern integrative medicine practice. The study, thus, reconciles diverse medical traditions and perspectives within the educational sphere, responding to the globalization of healthcare and the need for culturally competent practitioners proficient in multiple medical systems, highlighting how language education can contribute to the development of effective pedagogical approaches and research in this field.

2. Conceptualizing CDA and Integrative Medical Education

Critical Discourse Analysis (CDA), also known as critical discourse studies (CDS), is a multidisciplinary approach that focuses on examining how power abuse, such as sexism, racism, and social inequality, is reproduced through language and communication. It also explores the resistance against such domination. CDA does not adhere to a specific method but utilizes relevant methods from the humanities and social sciences to study

significant social problems. Unlike other approaches, the CDA framework not only connects discourse structures to social structures but also establishes a sociocognitive interface that links mental representations of communication and social situations with the cognitive structures underlying discourse. Power is conceptualized as control, encompassing the manipulation of context, text, or talk, and indirectly influencing individuals' minds (Van Dijk, 2015b). Critical social analysis, rooted in the tradition of Marx, recognizes social reality as conceptually mediated, meaning that social events and practices are intertwined with representations and interpretations. This material-semiotic perspective emphasizes the dialectical relationship between the material and the semiotic aspects of social realities, necessitating an interdisciplinary approach that brings together disciplines focused on both material and semiotic facets. CDA contributes a semiotic emphasis and acts as a point of entry into trans-disciplinary critical social analysis (Fairclough, 2012).

The concept of integrative medicine, which melds traditional Chinese medicine with Western medical science, stands at the forefront of modern medical educational dialogue and serves as a cornerstone of curricular enhancement (Liu et al., 2020; Wang & Zhang, 2017). The complexity of integrating Chinese and Western medical traditions and views within educational settings is echoed by a trend gaining momentum across academic institutions to achieve a balanced curriculum (Dusek, 2010; Fu et al., 2021; Ke & Hao, 2003; Yin, 2021; Zhang et al., 2016).

The integration of Chinese and Western medical traditions in medical education offers numerous benefits including holistic understanding of healthcare, exposure to a range of complementary therapies such as acupuncture, herbal medicine, and mind-body practices, expanding their treatment options and potentially improving patient outcomes, promotion of interprofessional collaboration into the curriculum, allowing students gain a better understanding of other professions' roles, leading to improved collaborative patient advocacy and comprehensive healthcare (Templeman et al., 2016). Integrating Chinese and Western medical traditions also encourages interdisciplinary research collaboration and innovation, leading to new insights and approaches in healthcare (Scheid, 2002) and personally-tailored complementary medical strategies as part of an optimized overall health care management (Jeitler et al., 2023).

3. Review of Empirical Studies of CDA with Language and Medical Education

Past researches concerning CDA with language and medical education have been conducted in various contexts where linguistic competency is receiving gradual important in medeical training and health care industries. Chitindingu et al. (2014) revealed an educational lag in South Africa, reflecting a broader global challenge of aligning curricular innovations with societal reliance on

traditional medicine. This accentuates the necessity for culturally sensitive curricula and language education strategies (Al Shamsi, 2020; Chen & Lu, 2006; Mary & Nassima, 2018), which address the language barriers impacting patient satisfaction and safety. The importance of considering professional identity alongside competency development in medical training (Jarvis-Selinger et al., 2012) and critical examinations towards linguistic and discursive practices (Parish, Dogra, & George, 2022), have inspired the research into the crucial necessity of moving beyond teaching language competencies in isolation and instead incorporating innovative language education as an approach to understand the social and cultural dimensions of language use in healthcare settings (Jarvis-Selinger et al., 2012). Study into large language models (LLMs) (Ahn, 2023) has the potential to significantly impact medical education by recognizing the close relationship between linguistic readiness in retrieve information retrieving, essay and articles generation, reasoning in a chain of thought, and human-like speech production while limitations such as hallucination and inconsistency are noted (e.g., Bell et al., 2002; Black & Slavich, 2016; Johns Hopkins University, 2022; Kemppainen et al., 2018; Kuo, 2015; Maizes, Rakel, & Niemiec, 2009; Pike et al., 2014) (as cited in Ahn, 2023), emphasizing the urgency in medical practitioners' language competency training to tackle the above problems.

CDA emerges as a pivotal tool for cultivating students' analytical capabilities within medical discourse, enhancing their understanding of socio-political influences on medical practices (David et al., 2005; Fairclough, 2013; Gwen & David, 2018; Van Dijk, 2015a). CDA exposes underlying biase and power dynamics within medical education, such as the insufficient coverage of cultural diversity topics in curricula and guidelines. Studies (e.g., Jarvis-Selinger et al., 2012; Parish, Dogra, & George, 2022) have also emphasized the incorporation of CDA into medical education to facilitate the understanding and promotion of cultural diversity. Addressing these gaps through CDA allows for the development of culturally sensitive healthcare professionals who can better understand and meet the needs of diverse patient populations, reducing health disparities (Parish, Dogra, & George, 2022).

Furthermore, the significance of communication skills in clinical effectiveness and patient-centered care is corroborated by studies emphasizing linguistic competencies and narrative medicine as pedagogical tools to foster empathy and culturally sensitive treatment plans (Albert et al., 2008; Eisele et al., 2019; Kim & Park, 2019; Kragel and Beyer, 2021). The call for bilingualism in medical education to manage cross-cultural healthcare scenarios (Ehi, 2006; Spitzer, 2016) is also echoed in recent research advocating for the integration of language and cultural awareness into medical training (Liang, 2023; Ortega & Prada, 2020).

Work on integrative healthcare and medical education in relation to language analysis in particular to CDA has generated and conceptualized the purposes and social function of interpreting ideological implications of language in documents and policies (e.g., Barreto, 2018; Martimianakis & Hafferty, 2013; Myers et al., 2022; Pas-

Lourido & Kuisma, 2013). However, despite the clear influence of language on patient interaction and the delivery of complex medical concepts, there remains a gap in research on specific curricular innovations that employ language education strategies to effectively combine Chinese and Western medical teachings and viewpoints (Thadphoothon, 2002; Zhao et al., 2023). The current research calls for a structured educational framework that harmonizes CDA with language strategies to meet the demands of a globalized healthcare system, an endeavor that extends beyond the classroom to impact the future of healthcare delivery. By incorporating CDA, educators can help students develop critical language awareness and navigate the complexities of communication in the medical field.

The theoretical support for curricular innovations in the realm of bridging language and medical education, illuminated by Chinese and Western medical perspectives, is deeply rooted in the principles of constructivist learning theories. Vygotsky's seminal work on constructivism posits that knowledge is not passively received but actively constructed through the learner's engagement with their environment and their experiences within it (Vygotsky, 1978). Nevertheless, to effectively prepare medical students for the complexities of diverse medical systems and cultural expectations, deeper attention to linguistic and cultural competencies is needed. In the current study, I argue for a conceptual framework that proposes the integration of CDA within the constructivist framework to bridge language education and medical training that enhance students' linguistic and cultural competencies (Figure 1). Vygotsky's constructivist framework emphasizes active knowledge construction through learner engagement, while CDA offers a research perspective and methodology to critically examine discourses and power dynamics in medical education (Fairclough, 2015). By integrating CDA with constructivism, students can critically analyze and challenge dominant discourses, leading to a nuanced understanding of language use in medical contexts (Rogers & Potter, 2011) and the skills to navigate linguistic and cultural boundaries, enabling effective communication and culturally competent care (van Dijk, 2015). The development of linguistic coherence and cultural sensitivity embedded in the integration of CDA within the constructivist framework provides a comprehensive approach to language education interventions, facilitating the development of students' linguistic and cultural competencies necessary for effective medical practice across diverse traditions.
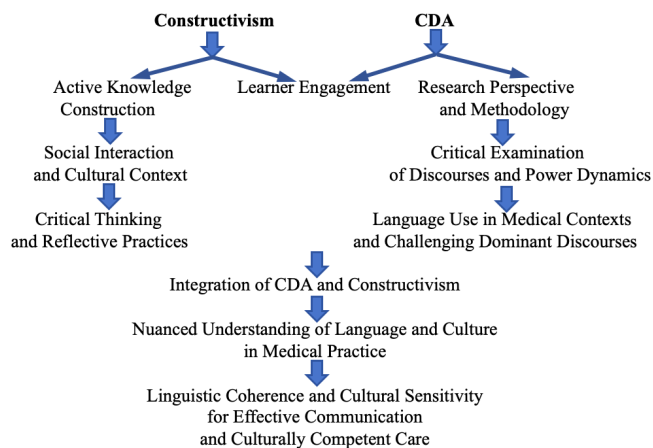

Figure 1. The Conceptual Framework

4. Methods

In preparation for the current study, a preliminary investigation was conducted, aiming to assess the educational landscape of integrative medicine within the institution where this study is practiced. The insights of it were derived from a combination of methods including a comprehensive literature review of historical trends, analysis of educational policy documents, and a survey distributed to faculty and students to gauge perceptions of integrative medical education. The findings depict an educational environment where integrative medicine, the confluence of traditional Chinese medicine (TCM) and Western medicine, has been gaining momentum, reflecting the national trend since the 1950s. Insights from the study indicate a strong propensity within the faculty and student body towards embracing integrative medicine's comprehensive healthcare approach, which aligns with the positive attitudes seen in the broader medical community, as reported by the 2004 national survey endorsed by the SATCM (Chen & Lu, 2006).

Despite the enthusiasm, the preliminary research has also highlighted several challenges that need to be addressed. Issues such as the need for more robust government backing, increased funding, and the development of human resources were noted, along with a call for more rigorous academic collaboration and exchange. These challenges form the core focus areas that the current study seeks to address, with the goal of establishing ample experiences in language education for a future integrative medical education curriculum that not only combines Chinese and Western medical traditions and perspectives but also includes innovative language education strategies to facilitate high-quality healthcare training.

4.1. Research Questions

1. What are the current challenges and benefits of conducting integrative medical education?

2. How does an educational intervention focused on CDA and linguistic representation influence students' abilities to understand and critically evaluate the portrayal of traditional and Western medical treatments in news media?

3. In what ways does the incorporation of language education for an integrative medicine curriculum enhance cultural competency and communication skills during patient care simulations for medical students?

4.2. Participants and Data Collection

The current study involved 120 second-year clinical medicine students and 20 medical faculty members, selected to represent a broad spectrum of opinions on the integrative medical education. The participant pool was chosen to include stakeholders with diverse perspectives, including students from various medical disciplines, faculty with a wide range of academic and clinical experience, and practitioners with different specializations and years of professional experience. This deliberate selection aimed to capture a comprehensive and multidimensional understanding of the integration, facilitating the collection of rich, qualitative data to inform the robustness and credibility of the research findings (Table 1).

Data was collected using a structured questionnaire called Integration of Chinese Medicine Tradition in Medical Education Questionnaire (Appendix 1) with 15 Likert scale items and five open-ended questions, assessing attitudes, perceived efficacy, and receptiveness to the integrative approach in clinical practice and education. Distributed electronically through WeChat groups and academic mailing lists, the questionnaire reached participants efficiently. Additionally, focused group interviews with 7 students and 20 medical faculty members allocated in four groups were conducted to provide in-depth insights. These interviews, structured around pre-determined open-ended questions (Appendix 2), were conducted in environments conducive to open discussion and were audio-recorded with consent.

For assessing the effectiveness of language education intervention, the investigation included the above mentioned 120 second-year clinical medicine students who were from two administrative classes, thus automatically formed two distinct groups of students: 60 taught by a traditional medical curriculum and 60 taught by an innovative curriculum enhanced by language education strategies as the corpus-assisted learning experiment. Additionally, for patient care simulation exercises, international students from the university where the author worked and collected the data assumed the roles of patients and Western community members, while other students, 30 each chosen randomly from experimental and control groups respectively, acted as doctors and cultural mediators. This diverse assembly of participants was instrumental in evaluating the impact of language education in medical contexts, particularly regarding the integration of traditional and Western medical practices.

To further determine and explore the effect of language education intervention on medical practice and outcomes, data was collected through a multi-faceted approach for the experiment. Initially, pre- and post-tests featuring essay questions assessed students' understanding of media discourse's influence on patient care, with a focus on cultural sensitivity and evidence-based practice (Appendix 3). The post-test question, which is a continuation of the same scenario, is designed to assess how much the students' understanding and communication strategies have evolved after the language education intervention, particularly their ability to apply CDA to real-life patient interactions, to test students' understanding and attitudes towards *How does a CDA initiated learning on linguistic representation influence students' abilities to understand and critically evaluate the portrayal of traditional and Western medical treatments in news media?*

For practical application, patient care simulations were conducted to disseminate and analyze the differences and similarities between Chinese and Western medical diagnostics and treatments. A scoring system (Appendix 4) was devised for international students, who were blind to the educational approach differences, to evaluate the performance of their peers. This blinding was crucial to maintain objectivity in assessing the effectiveness of the integrative curriculum and depicting the influence of language and curricular innovations mainly contributed by the corpus-assisted learning experiment in the current study on healthcare outcomes.

Table 1. Demographic information of focused group interviewees

Group	Role	No. of Participants	Gender Distribution	Major/Credential Background	Age Range	Years of Experience with Chinese and Western medicine tradition in an integrated learning and teaching
1	Students	7	4 Female, 3 Male	Clinical Medicine (3), Nursing (2), General Medicine (1), Psychological Medicine (1)	18-26	1-3
2	Teaching Faculty	6	3 Female, 3 Male	PhD in Medicine related Education (3), MD with Specialization in Traditional Chinese Medicine (2), PhD in Pharmacology (1)	35-50	2-5
3	Practitioners	8	3 Female, 5 Male	General Practice (3), Traditional Chinese Medicine (2), Pharmacology (1), Oncology (1), Pediatrics (1)	28-55	3-12
4	Mixed Group	6	3 Female, 3 Male	Health Policy Expert (1), Medical Ethicist (1), Clinical Researcher (2), Integrative Medicine Advocate (2)	25-50	2-7

4.3. Data Analysis

The questionnaire data were processed to analyze quantitative responses from the 15 Likert items by SPSS, providing mean scores (M) and standard deviations (SD) for both groups—students from a traditional medical curriculum and those from the integrative medical education realized by the language education intervention, the corpus-assisted learning experiment. To examine the perceptual differences between students and faculty

members, independent sample *t*-tests were carried out, revealing significant disparities in several items. These statistical tests were chosen as the student and faculty responses represent two independent groups. Cohen's *d* was then computed for the items with significant *p*-values to determine the effect sizes, which offered a deeper understanding of the magnitude of the differences between the two groups. The calculation of effect sizes allowed for the evaluation of the practical significance of the perceptual gaps identified, particularly in the areas of ethics and holistic understanding in medical education. Thematic analysis, utilizing a systematic framework, was applied to qualitative data from the open-ended questions and focused group interview transcripts to identify dominant themes. The interview transcripts were meticulously coded and analyzed with NVivo 12 software to uncover recurring patterns and extract salient themes related to combining Chinese and Western medical traditions and perspectives in education.

Statistical analysis with SPSS were conducted to gauge the pre- and post-test results from the language education intervention, which surrounded a short essay question. Effect sizes were computed to determine the intervention's practical implications on the students' comprehension and application of the linguistic significance in representing Chinese and Western medical views in education. Quantitative analysis was also practiced to compare language education intervention outcomes between the two distinct groups. These statistical tests were adjusted for confounding variables to ascertain the effect of the curriculum differences with precision.

As rigorous and systematic as above described, the analysis was designed to ensure that the findings were not only statistically robust but also provided a nuanced depiction of the practical implications of integrating of Chinese and Western medical conventions related perspectives into the bridging of language and medical education. The thoroughness of these methods aimed to guarantee that the study's conclusions were reliable, replicable, and meaningful to stakeholders in the educational and healthcare training communities.

4.4. Language Education Intervention: The Corpus-Assisted Learning Experiment

Upon experiences, and mostly the challenges and benefits associated with integrating Chinese and Western medical traditions and views in clinical medicine education from questionnaire and focused group study, an innovative teaching experiment utilizing a corpus-assisted learning approach was gradually developed by the author. Central to this educational endeavor is the *MediSync Corpus*, a carefully curated linguistic corpus composed of 40 select news reports from *New York Times*, extending over a decade from 2013 to 2023. Each carefully chosen report averages around 300 words, culminating in a corpus of approximately 12,000 words that showcase a diverse spectrum of journalistic content. This includes editorials, articles, interviews, and discussions on health policy, providing a comprehensive view of the interplay between medical practices from varying traditions. *New York Times* was chosen for its journalistic rigor, international coverage, and a dedicated health and science section that ensures a balanced representation of both Chinese and Western medical treatments. Its extensive digital archive presents a valuable resource for analyzing how different medical approaches are framed and discussed within mainstream Western media, potentially revealing the linguistic nuances and biases that shape public discourse.

A group of 60 sophomore-year clinical medicine students who were participants in the questionnaire study forms the experimental group for this language education intervention experiment. They are engaged with the *MediSync Corpus* over a 12-week period, committing four hours each week. The corpus-assisted language education intervention is a structured 12-week program that unfolds in phases. Initially, students received training on corpus analysis tools, mainly AntConc, to conduct keyword searches and examine concordance lines (as in Table 2). As they became proficient, the focus shifted to identifying collocations and discourse patterns relevant to CDA, and thus putting more proper use of language and ideas into practice (e.g., patient care practices). Students engaged in tasks that require them to extract and analyze key linguistic items, such as terminology differences between Chinese and Western medicine and how these reflect underlying cultural perspectives and ideological purposes.

Table 2. Comparative Frequency of Medical Keywords in the *MediSync* Corpus

Keyword	Concordance Line Excerpt	Frequency
Acupuncture	"... *acupuncture* showed efficacy in chronic pain relief..."	25
Surgery	"*Surgery* remains the primary intervention for acute cases..."	30
Herbal	"*Herbal* remedies are often seen as complementary to pharmaceuticals..."	15
Antibiotics	"*Antibiotics* are prescribed for bacterial, not viral infections..."	20
Qi	"*Qi*, a central concept in Chinese medicine, is rarely acknowledged in Western treatments..."	8
Chemotherapy	"*Chemotherapy*, despite its side effects, is a standard cancer treatment..."	12
Yin and Yang	"The balance of *Yin and Yang* can influence treatment outcomes..."	10
Immunotherapy	"*Immunotherapy* represents a breakthrough in precision medicine..."	14

Table 2 is generated through AntConc to perform keyword searches and extract concordance lines from the *MediSync Corpus*. AntConc scans the corpus for the predefined medical keywords relevant to both Chinese and Western medical practices. It then records the context in which these keywords appear, creating concordance lines that show a snippet of text surrounding each occurrence. The frequency column is populated by counting how many

times each keyword appears within the corpus. This methodological approach allows for both quantitative and qualitative examination of the language used in the medical reports, providing insights into the integration of different medical traditions and perspectives and the cultural implications embedded within the language. The followings are several typical examples for conducing CDA as language education intervention practice. The first example is presented along with steps indicating how the language education intervention scheme was practiced as a pedagogical approach.

Example 1

"In a groundbreaking medical trial, the integration of acupuncture alongside chemotherapy has been shown to reduce patient recovery times. While chemotherapy attacks the cancer cells, acupuncture is credited with enhancing the body's Qi, promoting balance and alleviating the side effects of the Western treatment method. This holistic approach, fusing Yin and Yang principles with advanced biomedical therapies, illustrates a shift in the medical paradigm."

As for the key steps of guided CDA analysis, in the first phase of analysis, students focused on **Identifying Linguistic Features and Keywords**, where they must locate key terms such as *"acupuncture," "chemotherapy," "Qi," "Yin and Yang,"* tracking their frequency and contextual usage within the corpus. Moving to the second step, **Analyzing the Representation of Concepts**, the task was to dissect how Western and Chinese medical concepts are represented, understanding the implications of their linguistic framing and the ways in which traditional Chinese medicine might be presented as a complement or challenge to Western practices. The third critical step, **Exploring Underlying Ideologies and Cultural Perspectives**, involved a deeper discussion on how language reflects the evolving ideology towards a more integrative medical system that respects both Chinese and Western methodologies, indicating a shift towards appreciating holistic well-being alongside traditional biomedical approaches. Finally, in **Reflecting on Societal Implications**, students deliberated on how these integrative practices could influence patient care and medical education, contemplating the role of language in perpetuating or challenging cultural biases in treatment paradigms.

In this corpus-assisted learning experiment, students employed CDA to investigate the representation of Chinese and Western medical practices within a corpus of *New York Times* health reports, aiming to discern cultural biases and construct a more integrative approach to clinical medicine learning (Martin, 2004). By examining the frequency and context of Eastern and Western medical terms and their juxtaposition, such as the portrayal of *"acupuncture"* versus *"surgery"*, students critically analyzed how language shapes the perceived hierarchy and legitimacy of treatments, which in turn might influence healthcare choices and patient expectations, for enhancing students' analytical skills and fostering an appreciation for the nuanced interplay of language, culture, and ideology, ultimately promoting culturally competent medical practice.

Several examples (as in Table 3) combining corpus analysis results with concordance lines, key words, CDA, and the implications of language use as the followings are good demonstrations of how CDA can be used to uncover biases in medical treatment narratives, thus offering a framework for students to dissect medical narratives through CDA, enabling them to understand the impact of linguistic choices on societal healthcare perceptions and behaviors, and to unearth biases that influence patient decisions, policy-making, and the cultural embrace of varied medical traditions and practices.

Table 3. Examples of Corpus Analysis Results

Sample	Concordance Lines & Key Words	CDA	Implications of Language Use
1	*"ancient herbal medicine", "alternative acupuncture", "complementary techniques"* vs. *"advanced immunotherapy", "cutting-edge surgery", "standard treatment"*	The use of terms conveys a hierarchy of legitimacy and modernity, with Western medicine positioned as superior.	Such language could influence public and professional trust in different medical systems, potentially affecting healthcare choices and policy.
2	*"patient was given acupuncture", "patient underwent herbal treatment"* vs. *"patient chose surgery", "patient opted for chemotherapy"*	Depictions of agency differ, with traditional treatments often presented passively and Western treatments actively.	This framing may affect perceptions of autonomy and control within healthcare, impacting patient empowerment and consent.
3	*"surgery was successful", "treatment was effective"* vs. *"patient responded well to acupuncture", "patient's condition improved with herbs"*	Success is attributed to the treatment in Western medicine and to the patient's response or external factors in traditional medicine.	This could shape expectations of treatment outcomes and trust in the efficacy of different medical approaches.
4	*"acupuncture is cost-effective", "herbal remedies are affordable"* vs. *"immunotherapy's high cost due to research", "surgery's expense is justified"*	Economic framing positions traditional medicine as a cost-saving option, while Western medicine is linked to innovation and research costs.	The economic narrative may influence how treatments are valued and chosen, potentially affecting access to and perceptions of different medical options.
5	*"patient's lifestyle complements acupuncture", "herbal remedies support well-being"* vs. *"immunotherapy targets disease", "surgery removes the problem"*	The language suggests that traditional methods enhance general health, whereas Western methods are framed as direct solutions to health issues.	This dichotomy could reinforce the idea that traditional medicine is preventative or supplementary, while Western medicine is curative, impacting the perceived purpose and efficacy of treatments.

5. Results

5.1. Questionnaire Results

The comparative analysis of perceptions on integrative medical education explored in the questionnaire revealed significant disparities between students and faculty (p < .05). Noted that M represents mean scores, SD stands for standard deviation. If p is smaller than .05, the result is considered statistically significant. As for Cohen's d, which is a widely used effect size statistic that quantifies the differences between two groups in standard deviation units for determining the practical significance of the observed differences, .2 is 'small', .5 is 'medium', .8 is 'large', and 1.2 is 'very large'. A larger Cohen's d value indicates a larger effect size and a more substantial differences between groups.

Faculty members displayed more favorable perceptions compared to students, as indicated by Cohen's d effect sizes ranging from small to large. They also demonstrated a robust endorsement of a holistic medical approach, advocating for the relevance of traditional Chinese medicine in contemporary healthcare and emphasizing its ethical merits.

Notably, Items 8, 11, and 16 exhibited pronounced differences, highlighting varied challenges and advantages in the integration process. Specifically, in Item 8, faculty members had a mean score (M) of 4.573 with a standard deviation (SD) of .497, while students had a mean score of 4.134 with an SD of .623. The t-value for this item was -4.512, indicating a significant difference between faculty and students ($p < .001$). The effect size, as measured by Cohen's d, was .763, reflecting a large difference between the two groups. For Item 11, faculty members had a mean score of 4.689 (SD = .437), whereas students had a mean score of 4.197 (SD = .543). The t-value was -5.147, indicating a significant difference ($p < .001$). The Cohen's d effect size for this item was .811, indicating a large difference between faculty and students' perceptions. In Item 16, faculty members had a mean score of 4.512 (SD = .549), while students had a mean score of 3.921 (SD = .691). The t-value was -4.786, indicating a significant difference ($p < .001$). The Cohen's d effect size for this item was .774, suggesting a large difference in perceptions between faculty and students.

On the other hand, students expressed reservations, particularly regarding the practical application of traditional concepts in modern healthcare. This indicates a perceived gap between theory and practice. The differences in perception between faculty and students also underscore the need for strategies that effectively integrate medical traditions while aligning with both faculty and student perspectives.

Key items, such as Items 11 and 20, demonstrated major effect sizes, with Cohen's d values of .811 and .746, respectively. These findings emphasize the importance of addressing the perceptual contrast and implementing educational strategies that bridge the gap between theory and practice.

5.2. Focused group interview results

Utilizing NVivo 12 software for qualitative data analysis, a three-tiered coding hierarchy (Table 4) was established to delve into the integration of Chinese medical traditions and perspectives into medical education. Initial coding (Level 1) pinpointed discrete elements e.g. "Holistic patient care" and "Cultural sensitivity", which were then abstracted into Level 2 categories such as "Holistic Education Principles" and "Cultural and Ethical Integration". These categories coalesced into the overarching theme of "Educational Impact". "Curriculum Development Challenges" and "Evidence and Resource Gaps" encapsulated the obstacles in integration, contributing to the "Integration Difficulties" theme. On the practical front, "Innovative Teaching Strategies" and "Clinical Practice Enhancement" emerged as pivotal, forming the "Practical Application" theme, while "Case-Based Learning" underscored "Clinical Relevance". Lastly, themes of "Faculty Development" and "Student-Faculty Dynamics" were recognized under "Enhancement Strategies", highlighting organizational improvement and support as essential for optimizing the incorporation of Chinese and Western medical traditions and practices. This stratified analytical approach underscores the complexities and interconnectedness inherent in assimilating traditional medical knowledge into contemporary medical education.

Table 4. The 3-Level Coding Result of Questionnaire

Level 1: Initial Codes (Open Coding)	Level 2: Categories (Axial Coding)	Level 3: Themes (Selective Coding)
Holistic patient care	Holistic Education Principles	Educational Impact
Ethics and values in medicine		
Traditional medical knowledge		
Cultural sensitivity	Cultural and Ethical Integration	
Interprofessional learning		
Curriculum integration issues	Curriculum Development Challenges	Integration Difficulties
Resistance to change		
Lack of research evidence	Evidence and Resource Gaps	
Time constraints		
Teaching methods adaptation	Innovative Teaching Strategies	Practical Application
Hands-on clinical practice		
Application to patient care		
Preventive care approaches	Clinical Practice Enhancement	
Case study relevance	Case-Based Learning	Clinical Relevance
Patient outcome improvement		
Decision-making processes		
Clinical ethics		
Faculty training needs	Faculty Development	Enhancement Strategies
Student engagement	Student-Faculty Dynamics	
Interactive learning		
Feedback mechanisms	Continuous Improvement Processes	
Curriculum recommendations		
Resource allocation	Organizational Support	
Evidence-based integration		
Collaboration enhancement		

5.3. Experiment on language education intervention results

Effects of language education intervention through corpus-assisted CDA approach demonstrate a practical significance (Table 5). Intra-group analysis for the experimental group demonstrated a statistically significant increase in mean scores from the pre-test (M = 72.5, SD = 8.5) to the post-test (M = 83.4, SD = 6.3). Repeated measures ANOVA indicated a significant effect of the intervention ($F_{(1, 59)}$ = 162.33, p < .001), with a large effect size (Cohen's d = 1.44). The control group's intra-group analysis showed a minor improvement in mean scores from the pre-test (M = 73.2, SD = 8.2) to the post-test (M = 74.1, SD = 8.0). The change was not significant as per the repeated measures ANOVA ($F_{(1, 59)}$ = 1.12, p = .293), and the effect size was small (Cohen's d = .11). Inter-group comparisons were performed using independent samples t-tests. The pre-test scores were not significantly different between the experimental and control groups ($t_{(118)}$ = -.54, p = .589), implying equivalent baseline competencies. However, the post-test scores were significantly higher in the experimental group (M = 83.4, S = 6.3) compared to the control group (M = 74.1, SD = 8.0); the t-test confirmed this difference as significant ($t_{(118)}$ = 9.76, p < .001). The effect size for the post-test difference was substantial (Cohen's d = 1.39), indicating a strong impact of the intervention.

Table 5. Comprehensive Analysis of Language Education Intervention Impact

Group	Test Phase	M	SD	N	Cohen's d
Experimental	Pre-Test	72.5	8.5	60	-
	Post-Test	83.4	6.3		1.44
Control	Pre-Test	73.2	8.2	60	-
	Post-Test	74.1	8.0		.11

5.4. Medical simulation performance results

The statistical analysis presented in Table 6 clearly demonstrates a significant difference in patient care simulation performance between students who were taught using a traditional medical curriculum and those who experienced language education intervention through corpus-assisted CDA approach, an integrated curriculum that merges Chinese and Western medical traditions related views in the current study. The mean scores across all outcome measures are consistently higher for the integrated curriculum experimental group, denoting superior performance in each evaluated competency. The t-values, which reflect the ratio of the difference between the two group means relative to the variability of the scores, are quite large. This indicates that the differences in mean scores are not due to random chance but are likely the result of the pedagogical intervention under which the students were trained. The p-values, which denote the

probability that the observed differences are due to chance, are less than .001 for all measures. Cohen's *d* values are above .8, indicating that the differences in performance between the two groups are not only statistically significant but also practically important.

Table 6. Comparative Analysis of Student Performances in Simulated Medical Settings with Traditional vs. Integrated Curricula

Outcome Measures	Control Group (n=30)	Experimental Group (n=30)	*t*	*p*	Cohen's *d*	Effect Size Interpretation
Medical Knowledge	M = 21.3 SD = 2.367	M = 25.5 SD = 2.134	8.21	< .001	1.84	Large
Communication Skills	M = 20.1 SD = 2.582	M = 24.8 SD = 2.217	7.56	< .001	1.70	
Cultural Sensitivity and Mediation	M = 19.7 SD = 2.458	M = 26.1 SD = 1.926	10.89	< .001	2.45	Very Large
Clinical Reasoning and Decision-Making	M = 20.4 SD = 2.345	M = 26.3 SD = 2.041	9.73	.001	2.18	
Professionalism and Ethical Considerations	M = 21.0 SD = 2.124	M = 25.6 SD = 2.308	8.43	.002	1.89	Large
Patient Engagement and Empathy	M = 20.8 SD = 2.679	M = 24.9 SD = 1.837	6.71	.002	1.60	
Teamwork and Interdisciplinary Collaboration	M = 20.5 SD = 2.435	M = 25.7 SD = 2.198	8.01	.003	1.80	
Adaptability and Problem-Solving	M = 19.9 SD = 2.528	M = 25.4 SD = 2.329	8.33	.002	1.87	

To contextualize the statistical findings of Table 6 and assess the real-world effects of amalgamating Chinese and Western medical traditions in education via language education intervention, qualitative research was undertaken through random on-site interviews with international students involved in medical simulations. They were informed about the language education intervention through corpus-assisted CDA approach conducted upon the experimental group after their blinding evaluation to both groups' performances in the medical simulation exercises, enabling a better differentiation towards the subjective experiences and observed performance disparities between students from traditional and integrated curricula, thus, offering deeper insight into the enhanced cultural sensitivity, communication proficiency, and clinical reasoning adaptability reported. These firsthand accounts from simulated patients and community members have enriched the quantitative data and shed light on the educational impact of such integration, elucidating the mechanisms through which students in the integrated curriculum translated their academic learning and linguistic gains into effective practice skills.

The following selected interview excerpts are personal accounts suggesting that the integrative medical education by the language education intervention has created a more adaptable, culturally competent, and empathetic approach to patient care, which is reflected in the improved simulation performance scores.

Excerpt 1
I will give a positive recognition to the students' who received the language [education intervention] program ability to engage with a diverse patient background, showing an individualized approach that respected the patient's cultural and personal circumstances.

One international student, who acted as a patient with a complex medical history, described their interactions with both student groups. This perspective is particularly relevant to the 'Cultural Sensitivity and Mediation' and 'Patient Engagement and Empathy' outcomes where the integrated curriculum students scored markedly higher.

Excerpt 2
I noticed a clear difference in the way the integrated curriculum students communicated, exhibiting greater cultural awareness and sensitivity compared to their traditionally trained peers.

Another international student, portraying a resident from the Western community, provided feedback that speaks to the 'Communication Skills' and 'Professionalism and Ethical Considerations' outcomes. The integrated curriculum students' higher scores suggest a more nuanced approach to intercultural dialogue and professionalism.

Excerpt 3
The experimental group participant reflected on the confidence and comprehensive approach they gained from the integrated curriculum. This education allowed them to navigate clinical scenarios with a level of sophistication and cultural competence that was less apparent among students from the traditional curriculum.

The third international student shared his experience, which is relevant to the 'Clinical Reasoning and Decision-Making' and 'Teamwork and Interdisciplinary Collaboration' outcomes after being told about the language education intervention.

6. General discussion

6.1. Connections and interplay between research findings

What are the current challenges and benefits of conducting integrative medical education? The statistical analysis of the data suggests that the integration of language education and medical education faces similar challenges to the combination of Chinese and Western medical traditions. While there is recognition of the potential benefits in both areas, there are challenges in effectively communicating the practical relevance to students. Faculty members, who might have a deeper understanding or appreciation of the synergies between these domains, are more convinced of the benefits. The NVivo 12 analysis provides a structured understanding of the complex interplay between the benefits and challenges of combining these two educational domains. The findings highlight the need for improved educational strategies that bridge the gap in perceptions and emphasize the practical applications of integrated medical traditions and language education in a way that resonates with student experiences.

In the context of language education and medical education integration, the benefits identified include the promotion of a more holistic approach to medicine and language learning, innovative teaching methodologies, enhanced clinical practice through effective communication, and the relevance of education to real-world scenarios. Conversely, challenges are identified in terms of curriculum development that incorporates both language and medical content, evidence-based practice in language education, faculty preparedness in teaching the integrated curriculum, and fostering positive student-faculty interaction dynamics.

With the insights gained and preconditions established, the current study goes one step further into research question 2, whose findings indicate that a language education intervention focuses on CDA and linguistic representation substantially enhance students' abilities to understand and critically evaluate the portrayal of traditional and Western medical treatments in news media. This conclusion is drawn from the significant increase in post-test scores for the experimental group, which received the intervention, compared to the control group, which did not show a significant change. The large effect size for the experimental group further reinforces the effectiveness of the intervention. Pre-test comparisons confirm that both groups began with similar skill levels, ruling out initial ability differences as a factor. The significant improvements in the experimental group, as opposed to the negligible changes in the control group, underscore the impact of the educational intervention in equipping students with critical analytical skills specific to media discourse on healthcare practices, suggesting that the intervention was effective in enhancing CDA skills specific to the linguistic representation of medical treatments in the news media context.

The language education intervention described, which incorporates guided CDA within a constructivist framework, aligns with the proposed integration of CDA and constructivism to enhance students' linguistic and cultural competencies (Martin, 2004). By engaging in CDA, students critically analyze the language used in *New York Times* health reports, examining the frequency and context of Eastern and Western medical terms and their portrayal, thereby developing a deeper understanding of the interplay between language, culture, and ideology (Martin, 2004). This intervention encourages active learner engagement and construction of knowledge through social interactions and authentic materials, reflecting the constructivist approach and its aim to bridge language education and medical training (Vygotsky, 1978).

Consequently, if the previous two research questions provide inspirations to inform policy decisions, curriculum design, and educational strategies for integrating language education and medical education, findings contributing to research question 3 supplement the comprehensiveness of the approaches that can bridge the gap between language education and medical education through enhancing students' abilities to effectively communicate in medical settings and providing them with the necessary language skills to navigate diverse patient populations and cultures.

In addressing research question 3, regarding the impact of language education for breeding an integrative medicine curriculum on the enhancement of medical students' cultural competence and communication during patient care simulations, the study's findings offer concrete evidence of the benefits. The comparative analysis reveals that students subjected to an integrated curriculum with a language education component exhibit superior performance across various competencies. Specifically, they show marked improvements in cultural sensitivity and mediation and communication skills, with very large and large effect sizes compared to their peers in traditional curricula. These results suggest that the integrated approach fosters a deeper understanding of cultural nuances and enhances the ability to communicate effectively in a medical context. The statistical metrics, *t*-values and *p*-values, underscore the significance of these improvements, indicating that the observed enhancements are a direct consequence of the pedagogical intervention rather than random variation. Such findings advocate for the inclusion of language education and cultural training as fundamental components of medical curricula, positing that this integrative model not only yields statistically significant advancements but also translates into substantial educational and practical benefits.

The testimonies from "patients", the international students reinforce the quantitative data, reflecting that the merger of medical knowledge with language and cultural education is instrumental in producing healthcare professionals who are adept at delivering patient-centered care across diverse cultural landscapes. Interviews suggest that the integrated curriculum highlighted by language education intervention not only equips the experimental group of students with a blend of medical knowledge but also fosters a deeper understanding of cultural contexts and patient-centered care. The participants' reflections corroborate the statistical findings, indicating that the integrative language and medical education could lead to better healthcare outcomes and more effective medical practitioners.

6.2. In comparison with previous findings

The current study builds upon previous research that highlights the potential for integrating Chinese and Western medical traditions in education, aligning with works such as Dusek (2010) and Fu et al. (2021). It expands on prior literature by identifying a perceptual disconnect between faculty and students regarding the practical application of integrated knowledge, filling a gap not extensively discussed in studies such as Al Shamsi (2020) and Chen & Lu (2006). While previous research has acknowledged the value of integration, the current findings emphasize the need for improved educational strategies that bridge theoretical understanding with clinical practice and resonate with students' experiences.

Additionally, this study provides empirical evidence supporting the effectiveness of CDA as a pedagogical tool, contrasting with the predominantly theoretical discussion on its role in medical education found in works such as Fairclough (2013) and Van Dijk (2015a). The study's quantitative assessment of integrated curriculum outcomes in simulated settings substantiates and quantifies the qualitative benefits suggested by prior research, as seen in works like Eisele et al. (2019) and Kim & Park (2019). This highlights the educational significance of incorporating Chinese and Western medical traditions and perspectives to produce competent medical professionals.

Moreover, the current study aligns with the works of Jarvis-Selinger et al. (2012) and Parish, Dogra, & George (2022) that emphasize the incorporation of CDA into medical education to understand and promote cultural diversity. It builds upon the notion that teaching language competencies in isolation is insufficient and instead advocates for innovative language education that explores the social and cultural dimensions of language use in healthcare settings. The study also relates to the literature on integrative healthcare and medical education, particularly in relation to language analysis and CDA, as discussed in works such as Barreto (2018), Martimianakis & Hafferty (2013), Myers et al. (2022), and Pas-Lourido & Kuisma (2013), which explore the ideological implications of language in documents and policies.

The current study contradicts previous findings by identifying a perceptual disconnect between faculty and students regarding the practical application of integrated knowledge, which was not extensively discussed in prior literature (Al Shamsi, 2020; Chen & Lu, 2006). While previous research has acknowledged the value of integrating Chinese and Western medical traditions, this study highlights the need for improved educational strategies that bridge the gap between theoretical understanding and clinical practice (Dusek, 2010; Fu et al., 2021). By addressing this disconnect, the study contributes to filling a research gap and provides insights into how educational approaches can better align with students' experiences and enhance the practical application of integrated knowledge.

Overall, the current study contradicts previous findings by highlighting the perceptual disconnect between faculty and students and contributes to filling research gaps by providing empirical evidence for the effectiveness of CDA and addressing the need for improved educational strategies in integrating Chinese and Western medical traditions.

7. Implications, Limitations and Conclusions

The findings from the pedagogical trials conducted in this study, specifically those concerning language education interventions, align with the theoretical framework that integrates CDA within the constructivist perspective. The design of the curriculum aimed to reflect real-world healthcare scenarios, facilitating active learning experiences that required students to critically engage with both Chinese and Western medical knowledge. The integration of simulated patient interactions, which combined elements from the two medical traditions and practices as well as crucial perspectives, was observed to deepen students' comprehension and their ability to apply this knowledge practically. This educational approach is consistent with the principles of constructivism, which advocate for contextual and active learning, and responds to the need for medical education to keep pace with the global convergence of medical practices.

Moreover, the study's results indicate that a constructivist-informed curriculum does more than enhance cognitive development, it also cultivates essential practical competencies in medical students. Structured around problem-solving tasks, collaborative work, and case-based learning, the curriculum should require active engagement with an integrated medical framework. These educational strategies reflect the constructivist perspective that learning is most effective when learners are actively involved in the knowledge construction process. The integration of CDA within a constructivist framework (Figure 1) is particularly relevant in the field of integrative medicine, where the blending of diverse medical systems requires a dynamic and culturally competent approach. The research thus supports the implementation of a constructivist approach that incorporates CDA in curriculum development to better equip future healthcare professionals for the challenges of delivering integrated and culturally competent patient care.

This study, while illuminating the benefits of language education in an integrative medicine curriculum, is not without limitations. Firstly, while the *MediSync Corpus* provides a focused dataset for exploring the linguistic portrayal of Chinese and Western medical practices in *New York Times*, its modest size of approximately 12,000 words is a limitation. With only 40 articles, the corpus may not capture the full range of discourse variations and could limit the generalizability of findings. For comprehensive linguistic analyses, a larger corpus would yield more robust insights into discourse patterns and terminological usage. Therefore, while suitable for introductory educational purposes, the corpus size constrains the depth and breadth of potential research outcomes. Secondly, the research did not extend to longitudinal follow-up investigations of the experimental group, which limits the ability to evaluate the durability of the enhanced cultural competence and communication skills over time. Such a

follow-up could provide insights into the long-term efficacy of the integrative educational approach in clinical practice. Additionally, the absence of further probing into how these skills translate to real-world patient outcomes leaves a gap in understanding the direct impact on healthcare delivery.

Future research should consider expanding the corpus size to encapsulate a broader range of linguistic expressions and to enhance the representativeness of the discourse analysis. Moreover, longitudinal studies are warranted to assess the persistent effects of integrative language education on cultural competence and communication skills, as well as to explore the direct correlation between these educational outcomes and patient care efficacy in diverse clinical environments.

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