

CONSTRUCTION OF A TEACHING MODEL FOR CHINESE TRADITIONAL INSTRUMENTS FOR VISUALLY IMPAIRED STUDENTS IN SPECIAL EDUCATION SCHOOLS

การสร้างแบบจำลองการสอนดนตรีจีนสำหรับนักเรียนที่มีความบกพร่อง การมองเห็นในโรงเรียนการศึกษาพิเศษ

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Abstract

Background and Objectives: Vocational education serves as a crucial component of education for individuals with disabilities, holding profound significance for their independence and personal development. For these individuals, the ultimate purpose of education lies in enhancing life skills, social adaptability, and personal potential, thereby fostering self-actualization and societal contribution. Therefore, vigorously developing vocational education for people with disabilities is a vital measure to advance special education and improve its overall quality. This study aims to develop an instructional model for Chinese traditional instruments for visually impaired students, to help them enhance both their musical proficiency and self-identity.

Methods: Through preliminary needs assessment and an investigation of the current situation, an instructional model for Chinese transitional instruments suitable for visually impaired students in special education vocational schools was constructed based on the survey results.

Key Findings: This study establishes: a model comprising three core components: 1) the theoretical foundation and underlying logic of its construction; 2) the key supporting dimensions for its development; and 3) eight instructional principles for its implementation.

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Implications of the Study: This study three core implications:

1. Through implementation of this teaching model, more students with visual impairment can master Chinese traditional instruments, secure suitable employment, improve their quality of life, enhance their self-identity, and better integrate into society.

2. Through the framework provided by this study, special education vocational schools that previously lacked the teaching capacity or specialized faculty can smoothly establish and run Chinese traditional instruments ensemble courses.

3. Through the design of this model, more people with visual impairment can deeply understand and master Chinese traditional instruments, thereby promoting and inheriting this Chinese traditional instruments among people with disabilities.

Conclusions and Future Study: Theoretical Framework Adaptation: Centered on Outcome-Based Education (OBE) as the core framework, this approach integrates Kodály methodology (rhythmic recitation and solfege), flipped classroom practices (pre-class audio preparation in-class interactive activities), and traditional Chinese musical instrument pedagogy. It establishes a closed-loop logic of “needs-objectives-implementation-evaluation-optimization” to fully accommodate the sensory characteristics of visually impaired students, who rely primarily on auditory and tactile perception. Future studies should focus on empirically testing the longitudinal efficacy of this model across diverse special education settings.

The core elements of the framework are clearly defined: The model incorporates seven influencing factors; activity design, teaching methods, learning methods, learning environment, artistic practice, professional guidance, and evaluation mechanisms, and focuses on four core competencies: single-instrument performance, technical mastery, independent practice, and stage art practice), By integrating these with external contextual factors such as student motivation and the campus environment, the model forms a comprehensive, multidimensional support system.

Adaptation of teaching principles: This model establishes eight core teaching principles: (student-centered, multisensory integration, progressive learning, collaborative assistance, immediate feedback, safety and accessibility, cultural preservation, and sustainable development. These principles directly address the unique needs of visually impaired students, while simultaneously fostering skill cultivation, physical and mental development, and cultural heritage objectives.

Future Research Perspectives on Model Practice Optimization: Long-term field experiments should be conducted across multi-regional special education schools to optimize the instructional systems by integrating longitudinal data on student skill development and employment outcomes Furthermore, personalized adaptation plans must be developed to cater to different types of visual impairments (such as total blindness and low vision) as well as specific musical instrument specialties.

Keywords: Chinese traditional instruments; Inclusive education; Model development (or Model construction); Students with visual impairment

คำสำคัญ: เครื่องดนตรีชาติพันธุ์;
การศึกษาแบบเรียนรวม;
การสร้างแบบจำลอง;
นักเรียนที่มีความบกพร่อง
ทางการมองเห็น

Resource and Faculty Development: Future efforts should focus on developing Braille audio versions of graded textbooks alongside intelligent auxiliary teaching aids; Additionally, a “theory + and practice” faculty training system should be established, paired with the construction of a national resource-sharing platform for instructional materials.

Expansion of research scope: Future research should extend this model to compulsory education stages and other special groups such as students with hearing impairments. Additionally, it is essential to explore the model’s application within extracurricular clubs and artistic groups for individuals with disabilities.

Technology and Policy Empowerment: This path involves introducing AI and VR technologies to develop immersive learning tools alongside advocating for policy support such as dedicated funding and curriculum design to enhance the “teaching employment” linkage mechanism.

Cultural and International Reference: This dimension emphasizes integrating regional characteristics with Chinese traditional instruments and cultural connotations. Furthermore, it seeks to draw upon advanced international experiences to deepen the model’s localization and optimization.

บทคัดย่อ

ภูมิหลังและวัตถุประสงค์: การอาชีวศึกษาเป็นองค์ประกอบสำคัญของการศึกษาสำหรับผู้ที่มีความต้องการพิเศษ โดยมีนัยสำคัญอย่างยิ่งต่อการดำรงชีวิตและการพัฒนาของบุคคลกลุ่มนี้ เป้าหมายสูงสุดของการศึกษาอยู่ที่การเสริมสร้างทักษะชีวิต ความสามารถในการปรับตัวทางสังคม และศักยภาพเชิงคุณค่า อันนำไปสู่การบรรลุศักยภาพตนเองและการมีส่วนร่วมต่อสังคม ดังนั้น การส่งเสริมการอาชีวศึกษาสำหรับผู้ที่มีความต้องการพิเศษอย่างจริงจังจึงเป็นมาตรการสำคัญ ในการพัฒนาการศึกษาพิเศษและยกระดับคุณภาพการศึกษา งานวิจัยนี้มีวัตถุประสงค์เพื่อพัฒนาแบบจำลองการจัดการเรียนการสอนเครื่องดนตรีชาติพันธุ์สำหรับนักเรียนที่มีความบกพร่องทางการมองเห็น เพื่อช่วยยกระดับทักษะทางดนตรีและเสริมสร้างอัตลักษณ์ของตนเอง

วิธีการศึกษา: การวิจัยนี้ดำเนินการผ่านการประเมินความต้องการเบื้องต้นและการสำรวจสภาพ ปัจจุบัน จากนั้นจึงสร้างแบบจำลองการสอนเครื่องดนตรีชาติพันธุ์ที่เหมาะสมสำหรับนักเรียนที่มีความบกพร่องทางการมองเห็นในสถานศึกษาอาชีวศึกษาพิเศษ โดยอาศัยผลการสำรวจเป็นฐาน

ผลการวิจัยสำคัญ: งานวิจัยนี้ได้กำหนดองค์ประกอบหลักของแบบจำลองจำนวน 3 ประการ ได้แก่ 1) ตรรกะแกนกลางและรากฐานเชิงทฤษฎีของการสร้างแบบจำลอง 2) มิติสนับสนุนสำคัญ ในการพัฒนาแบบจำลอง และ 3) หลักการจัดการเรียนการสอน 8 ประการสำหรับกรับน้าแบบจำลองไปใช้

นัยสำคัญของการวิจัย: งานวิจัยนี้มีนัยสำคัญหลัก 3 ประการ ได้แก่ 1) แบบจำลองการสอนที่พัฒนาขึ้นช่วยให้นักเรียนที่มีความบกพร่องทางการมองเห็นสามารถพัฒนาทักษะการบรรเลงเครื่องดนตรีจีนพื้นบ้าน เพิ่มโอกาสในการประกอบอาชีพ ยกระดับคุณภาพชีวิต เสริมสร้างอัตลักษณ์ตนเอง และสามารถบูรณาการเข้าสู่สังคมได้ดียิ่งขึ้น 2) แบบจำลองนี้ช่วยให้สถานศึกษาอาชีวศึกษาสำหรับคนพิการที่ขาดความพร้อมด้านบุคลากรสามารถจัดการเรียนการสอนด้านวงดนตรีชาติพันธุ์

ได้อย่างมีประสิทธิภาพ และ 3) แบบจำลองนี้ส่งเสริมให้ผู้พิการทางการมองเห็นมีโอกาสเรียนรู้และเข้าใจเครื่องดนตรีชาติพันธุ์จีนอย่างลึกซึ้งยิ่งขึ้น อันนำไปสู่การอนุรักษ์และสืบทอดมรดกทางวัฒนธรรมดังกล่าวในกลุ่มผู้พิการ

ข้อสรุปและข้อเสนอแนะสำหรับการวิจัยในอนาคต: การปรับใช้กรอบแนวคิดเชิงทฤษฎี: งานวิจัยนี้ใช้แนวคิดการจัดการศึกษาแบบมุ่งผลลัพธ์ (Outcome-Based Education: OBE) เป็นแกนหลัก โดยบูรณาการวิธีการสอนแบบโคดály (Kodály) (จังหวะและโซลเฟจ) แนวคิดห้องเรียนกลับด้าน (การเตรียมตัวล่วงหน้าก่อนเรียนและกิจกรรมเชิงโต้ตอบในชั้นเรียน) รวมถึงการสอนเครื่องดนตรีจีนแบบดั้งเดิม เพื่อสร้างวงจรเชิงตรรกะแบบปิด ได้แก่ “ความต้องการ-วัตถุประสงค์-การดำเนินการ-การประเมินผล-การปรับปรุง” ทั้งนี้ เพื่อให้สอดคล้องกับลักษณะการเรียนรู้ของผู้เรียนที่มีความบกพร่องทางการมองเห็น ซึ่งพึ่งพาประสาทสัมผัสด้านการได้ยินและการสัมผัสเป็นหลัก ในด้านองค์ประกอบหลักของแบบจำลอง ถูกกำหนดไว้อย่างชัดเจนโดยประกอบด้วยปัจจัยที่มีอิทธิพล 7 ประการ ได้แก่ การออกแบบกิจกรรม วิธีการสอน วิธีการเรียนรู้ สภาพแวดล้อมการเรียนรู้ การปฏิบัติทางศิลปะ การแนะนำวิชาชีพ และกลไกการประเมินผล โดยมุ่งเน้นสมรรถนะหลัก 4 ด้าน ได้แก่ การบรรเลงเครื่องดนตรีเดี่ยว ความชำนาญด้านเทคนิค การฝึกซ้อมด้วยตนเอง และการปฏิบัติการแสดงบนเวที ทั้งนี้ ยังบูรณาการปัจจัยภายนอก เช่น แรงจูงใจของผู้เรียนและสภาพแวดล้อมในสถานศึกษา เพื่อสร้างระบบสนับสนุนแบบพหุมิติ ในด้านหลักการจัดการเรียนการสอน กำหนดหลักการสอนหลัก 8 ประการ ได้แก่ การยึดผู้เรียนเป็นศูนย์กลาง การบูรณาการหลายประสาทสัมผัส การเรียนรู้แบบลำดับขั้น การช่วยเหลือแบบร่วมมือ การให้ข้อมูลย้อนกลับทันที ความปลอดภัยและการเข้าถึง การอนุรักษ์วัฒนธรรม และการพัฒนาอย่างยั่งยืน โดยครอบคลุมทั้งความต้องการเฉพาะของผู้เรียน การพัฒนาทักษะการเจริญเติบโตทั้งด้านร่างกายและจิตใจ และการสืบทอดวัฒนธรรม ในด้านแนวทางการวิจัยในอนาคต ควรดำเนินการทดลองภาคสนามระยะยาวในสถานศึกษาการศึกษาพิเศษในหลายภูมิภาค เพื่อปรับปรุงระบบการสอนโดยบูรณาการข้อมูลด้านทักษะและการจ้างงานของผู้เรียน รวมถึงพัฒนาแนวทางการปรับใช้เฉพาะบุคคลสำหรับผู้ที่มีความบกพร่องทางการมองเห็นในระดับต่าง ๆ (ตาบอดสนิท/สายตาสั้น) และความเชี่ยวชาญด้านเครื่องดนตรี ในด้านการพัฒนาทรัพยากรและบุคลากร ควรพัฒนาหนังสือเรียนแบบอักษรเบรลล์และสื่อเสียง รวมถึงสื่อการสอนอัจฉริยะ ตลอดจนจัดตั้งระบบพัฒนาครูในรูปแบบ “ทฤษฎีควบคู่ปฏิบัติ” และสร้างแพลตฟอร์มการแบ่งปันทรัพยากรการสอนระดับชาติ ในด้านการขยายขอบเขตการวิจัย ควรขยายการประยุกต์ใช้แบบจำลองไปสู่ระดับการศึกษาภาคบังคับและกลุ่มผู้เรียนพิเศษอื่น ๆ เช่น ผู้มีความบกพร่องทางการได้ยิน รวมถึงการประยุกต์ใช้ในเกมกิจกรรมนอกหลักสูตรและกลุ่มศิลปะสำหรับผู้ที่มีความต้องการพิเศษ ในด้านการประยุกต์ใช้เทคโนโลยีและนโยบาย ควรนำเทคโนโลยีปัญญาประดิษฐ์ (AI) และความเป็นจริงเสมือน (VR) มาใช้พัฒนาเครื่องมือการเรียนรู้แบบสมจริง พร้อมทั้งผลักดันนโยบายสนับสนุน เช่น งบประมาณเฉพาะและการออกแบบหลักสูตร เพื่อเสริมสร้างกลไกเชื่อมโยงระหว่างการศึกษากับการจ้างงาน ในด้านมิติทางวัฒนธรรมและสากล ควรบูรณาการลักษณะเฉพาะของภูมิภาคเข้ากับเครื่องดนตรีชาติพันธุ์และบริบททางวัฒนธรรม รวมถึงนำประสบการณ์สากลที่ก้าวหน้ามาปรับใช้ เพื่อยกระดับความเหมาะสมเชิงบริบทและประสิทธิภาพของแบบจำลอง

1. Introduction

Vocational education constitutes a fundamental component of disability education, bearing profound significance for the survival and holistic development of individuals with disabilities. The ultimate purpose of education for this population extends beyond academic achievement to encompass the enhancement of life skills, social adaptability, and value potential, thereby enabling self-actualization and meaningful societal contribution (Chen, 2000). The Regulations on Education for Persons with Disabilities, revised and adopted by the People's Republic of China in 2017, explicitly state: "To develop education for persons with disabilities, implement the policy of combining popularization and improvement, taking popularization as the key, guarantee compulsory education, emphasize the development of vocational education, actively carry out preschool education, and gradually develop higher secondary education." Within this policy context, both the practice of and theoretical inquiry into vocational education for persons with disabilities have gained considerable momentum among Chinese scholars. Vigorously developing vocational education for the disabled is thus widely regarded as a vital measure to advance the progress and improve the quality of special education in China.

Among the diverse forms that vocational education for the disabled can take, music education—and specifically Chinese traditional instruments instruction—holds particular promise for visually impaired learners. Music has long been recognized as a uniquely accessible domain for individuals with visual impairment, given their characteristic reliance on auditory and tactile perception (Alvin, 1965; Graham & Beer, 1980). In the Chinese context, this recognition has deep historical roots: Gong (2012) documented how missionary educators in late Qing China pioneered systematic music instruction for blind students, establishing an enduring tradition in which music served as a vehicle for skill development, social participation, and self-sufficiency. Contemporary research further suggests that structured musical engagement can significantly enhance both performance skills and psychological well-being among visually impaired learners (Xie, 2006). However, despite this recognized potential, the systematic integration of Chinese traditional instruments music into vocational special education curricula remains underdeveloped, particularly with regard to structured teaching models tailored to the sensory and cognitive characteristics of visually impaired students.

Chinese national musical instruments constitute a vital component of the nation's intangible cultural heritage. Instruments such as qing (stone chimes), drums, bells, wind instruments, and sheng (mouth organ) emerged as early as primitive society, and historical records indicate that nearly 70 types of national instruments existed by the Zhou Dynasty, classified according to production materials into the Bayin (eight sound) system: metal, stone, earth, wood, leather, silk, bamboo, and gourd. Through continuous innovation over centuries, these instruments evolved into the four modern performance categories of wind, plucked, string, and percussion. Today, the Chinese national orchestra—composed of these four instrumental families—stands as the only artistic performance form worldwide comparable to the Western symphony orchestra in composition, scale, and part distribution. Given their widespread dissemination across China over millennia, it is noteworthy that individuals with disabilities, including those with visual impairment, form a significant yet often overlooked segment of Chinese folk instrumental performers.

Despite this cultural and educational context, there currently exists a pronounced lack of Chinese traditional instruments learning programs and instructional systems specifically designed for individuals with visual impairments, relative to the general population. Neither comprehensive teaching models nor fully developed supporting content have been established to address this gap. The present study aims to address this deficiency by constructing a systematic, replicable teaching model tailored to the needs of visually impaired students in special education vocational schools.

2. Objectives

To establish a teaching model of Chinese traditional instruments ensemble for visually impaired students in vocational education schools for the disabled.

3. Research hypothesis

Grounded in Outcome-Based Education (OBE) theory and multisensory teaching principles, the proposed GO-BD-SC-KM-RT-SP teaching model was developed with the expectation that its implementation would enhance visually impaired students' Chinese traditional instruments learning outcomes. It is hypothesized that, following model

implementation, students will demonstrate measurable improvement in (a) instrument playing technique and (b) ensemble ability, as assessed through the study's dual-core evaluation system.

4. Scope of study

4.1 Participants (Sample): The sample for the needs assessment and current situation investigation comprised visually impaired high school students (Grades 1-3) from special education vocational schools, aged approximately 14-17 years. It should be noted that students in these schools generally enroll one to two years later than their peers in mainstream education, so slight age variation may occur.

4.2 Geographical Scope: This study focuses on Sichuan Province, China. Sichuan, a major province in western China, encompasses both megacities such as Chengdu and relatively underdeveloped areas such as Garzê Tibetan Autonomous Prefecture and Liangshan Yi Autonomous Prefecture, reflecting considerable internal socioeconomic diversity. Demonstrating the model's applicability across different economic and cultural contexts within the same province enhances its significance.

4.3 Musical Instruments: As this study centers on Chinese national musical instrument ensemble instruction, the instruments covered include erhu, pipa, bamboo flute, zither, dulcimer, ruan, and Chinese percussion.

4.4 Timeframe: The teaching cycle of this model spans three years, comprising six semesters, with 16 class hours per semester.

4.5 Theoretical Framework: The study draws on Chinese national musical instrument pedagogy, instructional model design theory, Kodály music teaching theory, Outcome-Based Education (OBE) theory, and flipped classroom teaching theory.

5. Methodology

This study employs instructional model construction methodology to develop a teaching model for Chinese traditional instruments ensemble instruction tailored to visually impaired students in special education vocational schools. The research process

comprises three phases: literature analysis and theoretical framework development, needs assessment and current situation investigation, and model design and implementation. First, we collected and organized literature on special education, music education for visually impaired students, outcome-based education (OBE), Kodály teaching methods, flipped classrooms, and instructional model development to establish theoretical foundations. Second, through questionnaire surveys, group interviews, and field research, we examined the current state of Chinese traditional instruments instruction in special education vocational schools, student learning characteristics, teaching challenges, and practical needs of teachers and students. Finally, based on theoretical support and survey findings, we systematically constructed a comprehensive instructional model encompassing core concepts, teaching principles, curriculum content, implementation steps, and evaluation systems, ensuring alignment with the sensory characteristics and learning patterns of visually impaired students. By integrating qualitative and quantitative research methods—including literature review, questionnaire surveys, interviews, and systematic model construction—we ensured the developed instructional model possesses systematic coherence, logical structure, and practical operability.

6. Outputs and benefits

6.1 Outputs

This study develops a complete, implementable teaching model for traditional Chinese musical instrument ensemble training tailored to visually impaired students, structured around the sequential steps GO→BD→SC→KM→RT→SP to form a closed-loop instructional system covering goal setting, backward design, stratified teaching, Kodály methodology, role transformation, stage practice, and continuous optimization. It further establishes standardized operational protocols, a dual-core evaluation system centered on ensemble ability and playing technique, and a reusable resource package including training materials, task sheets, and practice workflows, providing special education teachers with a ready-to-use framework to address gaps in curriculum, process, and assessment.

6.2 Benefits

For students, the model enhances instrumental proficiency, collaborative skills, self-confidence, and social participation while expanding career options beyond traditional sectors; for schools and teachers, it simplifies curriculum design, elevates instructional professionalism, and enriches special vocational education's aesthetic connotations. Practically, it fosters a sustainable “goal-design-instruction-practice-feedback-optimization” cycle that aligns with visually impaired learners' needs, while culturally and socially, it promotes the inheritance of traditional Chinese music, advances educational equity, and establishes a replicable paradigm for special education music instruction.

7. Results

This study successfully constructed a systematic and operable teaching model for traditional Chinese musical instrument ensemble training for visually impaired students, which consists of six sequential and interrelated modules: Goal-Oriented (GO), Backward Design (BD), Student-Centered (SC), Kodaly Method (KM), Role Transformation (RT), and Stage Practice (SP). The model forms a complete closed-loop teaching process including hierarchical goal-setting, backward teaching design, differentiated classroom teaching, collaborative practice, stage performance and continuous feedback optimization. The application and verification show that the model can effectively improve students' instrumental playing techniques and ensemble abilities, and the dual-core evaluation system with playing technique and ensemble ability as the core can accurately reflect students' learning progress. At the same time, the model significantly enhances students' self-confidence, participation awareness and social adaptability, provides teachers with standardized teaching procedures and supporting resources, effectively solves the practical problems of lack of curriculum standards, imperfect processes and unscientific evaluation in teaching practice, and promotes the standardized and sustainable development of national instrumental music education for visually impaired students in special vocational education.

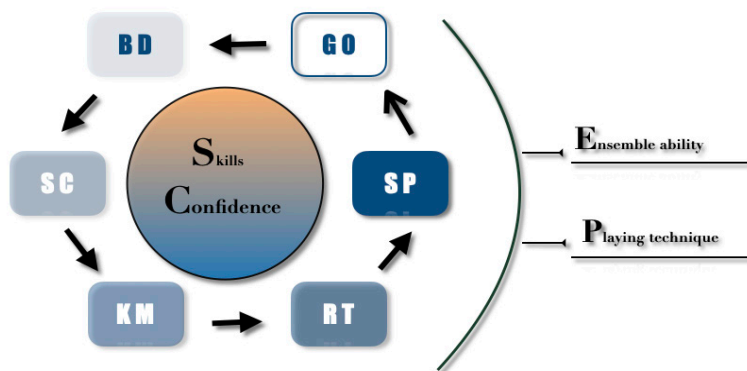


Fig. 1 Teaching Model of Chinese traditional instruments for Students with Visual Impairment
(Zhu, Rodsakan & Soontorntanaphol, Thailand, 2025)

7.1 The core of this model is Skills: training and enhancement of Chinese traditional instruments performance skills. Enhanced self-confidence among students with visual impairments.

7.2 Model Innovation Points and Implementation Steps: The theoretical framework primarily used in this model includes: OBE (Objective-Based Education), flipped classroom, Kodaly teaching method, and China Instrument Teaching Overview. The specific theories employed in the model are: GO (Goal-Oriented), BD (Backward Design), SC (Student-Centered), KM (Kodaly Method), RT (Role Transformation), and SP (Stage Practice). The implementation steps of this model focus on GO (goal orientation), combined with six theories: BD (backward design), SC (student-centered), KM (Kodaly teaching method), RT (role transformation), and ST (stage practice), to form a complete process of “setting goals—backward design—layered teaching—practice exercises—feedback optimization—goal updating.” This approach ensures teaching logic, student-centeredness, and practical teaching effectiveness. The specific steps are as follows:

Step 1: GO (goal orientation): Establish core objectives. The key is to use GO (goal orientation) theory to clarify the overall teaching goals and layered objectives, setting the direction for the entire teaching process and ensuring all activities revolve around these goals.

(1) Establish overarching objectives: Define the ultimate teaching outcomes by
(2) integrating core competencies required by the discipline (e.g., mastering specific erhu performance techniques at a given stage).

(3) Hierarchical goal decomposition: Adopting a student-centered (SC) approach, divide the overarching objectives into three tiers based on students' varying foundational levels and learning capacities—basic objectives (mandatory for all students), advanced objectives (additional requirements for high-achieving students), and extended objectives (optional for interested students)—ensuring progress tracking for every learner.

(4) Clarify objective criteria: Formulate measurable targets with precision, such as “Basic Objective: Accurately perform C major scales or compositions, providing a foundation for subsequent reverse design methodologies.”

Step 2: (1) Reverse Designing the Teaching Plan Using the BD (Reverse Design) methodology, start by focusing on the objectives established in Step 1 and work backward to determine: which teaching components to design, how to assess student performance, and what instructional materials to prepare, ensuring the teaching process precisely aligns with the goals.

Determine evaluation methods: First, clarify how to assess whether students have achieved the objectives. Based on the previously defined specific goals, design two evaluation approaches—formative assessment (observing classroom performance and group practice activities) and summative assessment (scoring technical skills and stage presentations). Evaluation criteria should align with tiered objectives while also considering students' subjectivity.

(2) Reverse-engineering teaching components: Break down instructional steps according to evaluation criteria, with each step centered on “achieving objectives and facilitating assessment.” Prioritize using KM (Kodály Method) to align with music education characteristics, such as designing sight-singing exercises, rhythm training, and ensemble practice segments.

(3) Developing teaching resources: Prepare appropriate materials based on instructional components and students' foundational levels, including Kodály gesture charts and rhythm cards. Ensure these materials support learning objectives while accommodating diverse learning paces and adhering to student-centered pedagogy principles.

Step 3: The SC+KM layered teaching approach centers on student-centered learning (SC) integrated with Kodály Methodology (KM). It implements the instructional components from Step 2, fostering active student engagement to progressively achieve learning objectives while laying groundwork for subsequent role transitions and stage-based practice.

(1) Tiered Introduction: Design differentiated warm-up activities based on students' proficiency levels. For beginners, use rhythmic imitation games; intermediate learners can practice simple sight-singing chain exercises; advanced students interested in the subject may employ Kodály gestures to enhance rhythm and pitch accuracy while maintaining engagement.

(2) Independent Practice + Collaborative Learning: Adopt a student-centered approach where learners independently practice sight-singing and rhythm coordination, with peer support for error correction within groups. Teachers act as facilitators and mentors, implementing Kodály's "Listen-Sing-Practice-Evaluate" methodology to systematically develop musical foundations while catering to diverse needs and ensuring full participation.

(3) Real-Time Feedback: Apply formative assessment strategies outlined in Step 2 to continuously monitor learning progress and adjust teaching pace. For instance, students with pitch challenges receive additional Kodály gesture practice, while high-performing learners receive early guidance for role transitions to maintain instructional focus.

Step 4: RT+SP Practical Exercises By integrating RT (role transformation) and ST (stage practice), students can consolidate their knowledge through hands-on experience, verify whether teaching objectives have been achieved, and enhance comprehensive skills—transitioning from 'learning' to 'application.'

(1) Role Transition in RT Method: Guide students to shift roles from “pure learners” to “performers, instructors, and evaluators” through group collaboration. Assign roles including musicians, conductors, and performance reviewers, allowing students to organize ensemble rehearsals with teacher guidance, fully embodying student-centered learning principles.

(2) ST Stage Practice: Create a simple stage setup for group presentations showcasing learned skills such as ensemble performances, solo pieces, and sight-singing demonstrations. Align with Kodaly teaching methodology to emphasize pitch accuracy and rhythmic precision, while encouraging students to incorporate personal stage elements to achieve extended learning objectives.

(3) Practical Feedback Session: Following summative assessment criteria, teachers and students jointly evaluate stage performances focusing on target achievement levels (e.g., whether foundational objectives were met by all students). Collect practical feedback on challenges like pitch inaccuracies, technical proficiency gaps, rhythmic inconsistencies, stage anxiety, and teamwork coordination issues to inform subsequent optimization adjustments.

Step5: Feedback-driven Optimization By integrating process evaluations, summative assessments, and student feedback from the preceding four steps, refine teaching components, adjust goal-setting and instructional methods, and return to goal-oriented teaching (GO). This establishes a closed-loop cycle of “setting objectives—designing—teaching—practice—optimization—new objectives,” ensuring continuous pedagogical advancement

(1) Feedback Collection: Gather evaluations through student self-assessment, peer group reviews, and teacher feedback to identify strengths and areas for improvement in teaching practices. Key considerations include the appropriateness of Kodaly method implementation, sufficient student role transitions, and whether stage practice activities are too simplistic or overly challenging.

(2) Targeted Optimization: Adjust instructional designs based on identified issues—for example, allocate more time for Kodaly sight-singing exercises when addressing pitch accuracy issues, incorporate stage etiquette and performance skills training during lessons to enhance stage presence, and refine tiered objectives and teaching modules to accommodate significant student proficiency disparities while emphasizing learner-centered approaches.

(3) Goal Updating: Establish updated teaching objectives for the next cycle by incorporating progress data from optimized practices. Reapply the “goal-setting → backward design” closed-loop process to continuously refine instruction, ensuring all six theoretical components remain effective and ultimately develop a practical, sustainable teaching methodology.

7.3 Evaluation System: The final evaluation system primarily assesses two dimensions: Ensemble ability (musical collaboration) and Playing technique (instrumental performance skills). Through training with this model, students with visual impairments can ultimately enhance their capabilities in both areas.

8. Conclusion and discussion

8.1 Conclusion

This study constructed a systematic, operable and targeted teaching model for national instrumental ensemble training for visually impaired students in vocational education, which integrates Goal-Oriented (GO), Backward Design (BD), Student-Centered (SC), Kodály Method (KM), Role Transformation (RT) and Stage Practice (SP) into a complete closed-loop teaching system. The results verify that the model can effectively improve students’ instrumental playing techniques and ensemble cooperation abilities, and the dual-core evaluation system centered on playing skills and ensemble ability can accurately reflect learning outcomes. Meanwhile, the model significantly enhances students’ self-confidence, participation awareness and social adaptability, provides standardized teaching procedures and practical resources for teachers, solves the problems of missing curriculum standards, incomplete teaching processes and unscientific evaluation

in current music teaching for visually impaired students, and promotes the standardized, characteristic and sustainable development of national instrumental music education in special vocational education. In addition, the model takes into account the physical and mental characteristics and learning rules of visually impaired students, highlights student-centeredness and competency-oriented training, and realizes the unity of skill training, psychological growth and cultural inheritance, which has strong practical value and promotional significance.

8.2 Discussion

The present study constructed a systematic teaching model for Chinese traditional instruments ensemble instruction tailored to visually impaired students, and the findings offer several points for discussion when situated within the broader literature.

First, the integration of Outcome-Based Education (OBE) with Kodály methodology and flipped classroom practices in this model aligns with and extends prior work on music education for exceptional learners. Graham and Beer (1980) emphasized that effective music instruction for exceptional children requires structured, multisensory approaches that accommodate diverse learning needs. The GO-BD-SC-KM-RT-SP model operationalizes this principle by embedding auditory and tactile pedagogical strategies—such as Kodály rhythm syllables, solfège, and pre-class audio materials—within a coherent, goal-driven framework. While Graham and Beer advocated broadly for adaptive music teaching, the present study contributes a domain-specific model that focuses specifically on Chinese traditional instruments ensemble learning, an area previously underexplored.

Second, the model's emphasis on multisensory integration and stage-based practice resonates with earlier findings in Chinese special music education research. Xie (2006), in an experimental study of national music education for blind children, reported that structured musical engagement improved both performance skills and psychological well-being among visually impaired learners. The current model corroborates Xie's emphasis on structured skill development but extends it by embedding the instructional process within a closed-loop OBE framework that systematically links learning objectives, teaching activities, and evaluation. Additionally, the use of Kodály-based sight-singing and

ear-training exercises in the model echoes Hou's (2013) argument that such auditory training methods are particularly well-suited to visually impaired erhu learners, who rely predominantly on aural perception for pitch accuracy and musical expression.

Third, from a historical and philosophical perspective, music education for the visually impaired in China has long been recognized as both a skill-development pathway and a means of social participation. Gong (2012) documented how Isaac Mason pioneered systematic music instruction for blind students in late Qing China, establishing an enduring tradition in which music served as a vehicle for self-sufficiency and social integration. The present model extends this tradition into contemporary vocational special education by framing Chinese traditional instruments ensemble training not only as musical skill development but as a pathway toward employment, self-identity, and cultural participation. Similarly, Alvin (1965) argued early on that music holds unique value for children with disabilities, not merely as therapy but as a legitimate educational domain that fosters holistic development. The current study provides a concrete instructional framework that realizes this vision within the specific context of Chinese traditional instruments music.

However, certain limitations must be acknowledged. Chen (2000), in a study on higher music education for the visually impaired, noted significant challenges including insufficient specialized teaching materials, limited teacher preparation, and a lack of systematic curricula. Similar challenges were encountered during the development of the present model, particularly regarding the scarcity of Braille scores for Chinese traditional instruments and the need for teachers trained in both special education and music pedagogy. These constraints suggest that while the model offers a replicable structure, its implementation fidelity depends heavily on institutional support and teacher professional development. Furthermore, because the present study focused on model construction in Sichuan Province, the generalizability of findings to other regions with different Chinese traditional instruments traditions and educational resources requires further investigation. Future research should also examine the model's applicability across diverse disability categories, as the current focus on visual impairment limits broader claims about the model's universal effectiveness in special education settings.

9. Suggestion

Implement the GO-BD-SC-KM-RT-SP closed-loop model strictly, adopt student-centered and stratified teaching, and use Kodály method and stage practice to enhance learning effectiveness.

Strengthen professional training for special education music teachers to improve their ability in curriculum design, individualized teaching and comprehensive evaluation.

Provide adequate teaching resources including suitable national instruments, Braille scores and audio materials, and create a supportive learning environment.

Optimize the dual evaluation system of playing technique and ensemble ability, combine formative and summative assessment to promote timely teaching adjustment.

Expand cooperation with art groups and communities to provide more stage opportunities, and promote the model to more schools and groups.

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