



Special Students' Alternative Piano Course-based Universal Design for Learning Music

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Received 06/10/2024

Revised 17/10/2024

Accepted 17/11/2024

Abstract

Background and Aims: In the context of globalization, informatization, and diversification, the education system breaks through traditional boundaries, integrates different educational forms, technologies, cultures, and resources, and builds a more inclusive, equitable, and adaptable education system. The "era of educational integration" emphasizes the popularization and fair distribution of educational resources, especially focusing on marginalized groups and special education groups. Inclusive education (special students studying in the same school as ordinary students) is also receiving more and more attention. In the face of the problem of diverse students' abilities and skills, higher education must establish a more inclusive teaching system. Universal Design for Learning (UDL) aims to expand learning opportunities for people with learning disabilities, allowing more students to master knowledge and skills, minimize learning barriers, and have fun. If the UDL framework is applied to piano teaching for college music education students, it will not only reduce the obstacles for learners with diverse abilities but also increase flexible and diverse learning styles. It can also help special learners adapt to the teaching profession after graduation. This research aims to investigate the individual differences among special students and to develop a piano teaching course based on the principles of Universal Design for Learning (UDL) to enhance inclusivity and effectiveness in music education.

Methodology: This qualitative study employed field surveys, semi-structured interviews, and participatory workshops to gather data from a diverse group of stakeholders, including students, teachers, parents, and psychologists, in Bangkok, Thailand, and Lanzhou, China. Talk for Reform seminar- workshop as Piano Alternative Course Rethinking for Special Students by UDL-CAST principle into reform the new course as Piano Alternative Course for development of piano lessons. A total of 44 participants, including 4 key informants and 40 survey respondents, were selected through random sampling and purposive sampling methods to ensure a representative and comprehensive understanding of the research problem.

Results: The results found that implementing a UDL-based piano teaching course significantly improved the learning environment, assessment standards, and individualized support for special





students, resulting in better engagement and performance across three levels of students over 14 weeks. This research demonstrates the effectiveness of UDL in creating inclusive and adaptive piano teaching courses, offering valuable insights for educators and policymakers to enhance music education for special students.

Conclusion: According to the study, a UDL-based piano teaching course significantly improved engagement, performance, and individualized support for special needs students. It demonstrates UDL's success in creating an inclusive, adaptive music education environment.

Keywords: Universal Design for Learning (UDL); Piano Alternative Course Teaching; Special Students Course Design

Introduction

In recent years, the evolution of China's higher education policy has attracted widespread attention. China's higher education system began in 1978. After 45 years of development, China's higher education policy has been continuously adjusted and improved, from quantitative growth to qualitative improvement. However, In the context of the "era of educational integration", China's higher education also faces many challenges. The traditional piano teaching system can no longer meet the diverse needs of today's students. Faced with diverse learners, the lack of teaching method updates in the music education system, the lack of integration between practice and teaching, and the uneven quality of education have always plagued the development of higher education for music in my country. To solve these problems, the Chinese government has taken a series of measures, such as promoting curriculum reform, optimizing curriculum, and promoting innovation in classroom teaching models. According to the Chinese Government Policy of the Ministry of Education, Implementation Opinions on First-class Undergraduate Course Construction (2019), The opinion puts forward: Curriculum is the core element of talent training, and the quality of the curriculum directly determines the quality of talent training. Quality improvement and reform through the diversification of student skills, the diversification of student abilities, and the development of alternative courses focusing on Chinese piano teaching courses, to promote the reform and innovation of institutions of higher learning.

At present, the traditional college piano teaching course has some limitations in meeting students' different learning needs, lacks personalized teaching, unable to meet the different learning needs and learning pace of each student. The learning atmosphere is monotonous and lacks teaching methods that stimulate students' interest and creativity. The instructor's single presentation of content leads to inadequate resources for the student learning process. Students lack adequate play opportunities and performance venues, which affects their actual performance ability, etc. Therefore, for every student to succeed. We need to design a new model of alternative





piano teaching methods to adapt to the learning of students with different backgrounds and piano foundations and to reduce their barriers in the learning process.

The CAST (Center for Applied Special Technology) organization proposed the "comprehensive teaching design": Universal Design for Learning (UDL), which aimed to expand the learning opportunities of people with learning disabilities, it is a teaching framework that aims to meet the different learning needs of all students through diverse teaching methods and resources. It emphasizes providing fair learning opportunities for students of different backgrounds, abilities, and learning styles. The core of UDL has three main principles: providing multiple ways of presentation (Representation), providing diverse actions and expressions (Action and Expression), and providing multiple ways of participation (Engagement). There are four main advantages.UDL: personalized learning, promoting inclusive education, increasing student autonomy and participation, and diversified assessment. Therefore, through the UDL framework, teachers can design flexible and adaptable courses to create better learning opportunities for all students.

The research on Universal Design for Learning in China is still in its infancy. As a term for instructional design, Universal Design for Learning is a new model for domestic researchers and teachers. Despite its advanced nature, Universal Design for Learning has been introduced in China since the 21st century, and there are pioneer researchers who have made efforts to put Universal Design for Learning into practice. However, most of the research is still in the theoretical stage. For example, Zhang Bei (Zhang, 2012) conducted a study on the application of Universal Design for Learning in college English teaching. So, if the UDL framework is applied to piano teaching in universities, it can not only reduce barriers to culturally diverse learners but also increase learning opportunities for all learners to understand the culture. Fills the research gap of the UDL framework in piano education for Special students in colleges and universities.

The investigator's main research objective is to create a development of alternative piano courses based on UDL theory. The course objectives start from three aspects: teaching content, teaching methods, and teaching environment. The scope of the study is set at the Conservatory of Music of Lanzhou City University in Gansu Province, northwest China, and the Faculty of Music of Thonburi University in Bangkok, Thailand. The final new course will be used in the Conservatory of Music of Lanzhou City University in China. This conservatory was established in 1979 and has a history of more than 40 years. It has advanced teaching hardware and facilities. There are 52 teachers and 759 diverse students from different backgrounds.

In summary, Special Students' Alternative Piano Course Based Universal Design for Learning Music can help create a more equitable, inclusive, and personalized learning environment for students with different backgrounds, abilities, and learning styles. It can also promote personalized learning, and improve learning outcomes and student engagement. It will also





promote educational equity and inclusiveness, and have an impact on future educational practice and policy making. In the context of educational integration, it will provide guidance for new piano teaching models in colleges and universities.

Research questions

To obtain the research results based on the above, this research is intended to:

- 1) What are the specific limitations of the current traditional piano teaching mode in accommodating students with diverse learning abilities, as identified through interviews and surveys with students, teachers, parents, and psychologists?
- 2) How does the implementation of a flexible and diverse piano learning mode based on the Universal Design for Learning framework impact the learning outcomes of students with varying abilities?

Research Objective

From the interview and survey, we know that the problems of the current traditional piano teaching mode cannot contain all the students with learning abilities. Applying the Universal Design for Learning (UDL) framework principles, Design the syllabus for the general piano education course.

- 1) Surveying special students' differences and studying alternative piano teaching courses.
- 2) Designing the piano alternative teaching based on Universal Design for Learning in music.

Literature review

Foreign Studies on Universal Design for Learning:

As a relatively new concept in education, it was both research-based and a driving force for further research. Based on the different principles of Universal Design for Learning (UDL), its application in various educational settings, and its demonstrated effectiveness in improving learning outcomes.

In terms of diverse representation, researchers continue to explore how to present information through a variety of means, such as visual, auditory, textual, and multimedia resources, to meet the needs of different learners. Hall (Hall et al,2013) pointed out that using multimodal instructional materials can improve students' understanding of complex concepts. Smith (Smith,2021) showed that the use of diverse expressions such as images, videos, and interactive content helps students understand course content more deeply, especially in remote and hybrid learning environments. In terms of the principle of diverse actions and expressions, researchers emphasize allowing students to express their understanding and knowledge in a





variety of ways and use different tools and strategies to demonstrate learning outcomes. Meyer & Rose (Meyer & Rose, 2014) showed that diverse modes of expression can help students, especially those with special needs, demonstrate their learning outcomes more effectively. Rao et al (Rao et al, 2017) found that the use of digital tools, project-based learning, and creative activities can significantly improve student engagement and academic performance.

The researchers also explored how to stimulate students' learning motivation through diverse motivations and engagement methods. Al-Azawei (Al-Azawei, 2017) showed that students' learning motivation and engagement can be significantly improved by designing flexible tasks and activities. Jones (Jones, 2022) further explored the potential of gamified learning and social learning platforms to increase student engagement, especially in online learning environments.

Domestic research on Alternative teaching method:

The research on Universal Design for Learning in China is still in its infancy. As a term for instructional design, Universal Design for Learning is a new model for domestic researchers and teachers. Despite its advanced nature, Universal Design for Learning has been introduced in China since the 21st century, and there are pioneer researchers who have made efforts to put Universal Design for Learning into practice.

Zhang Bei (Zhang, 2012) conducted a study on the application of Universal Design for Learning in college English teaching. Based on the Universal Design for Learning model, Zhang Bei designed a one-month practice and activity for students in a certain university.

Zhang Lin (Zhang, 2013) explored a way to apply the Universal Design for Learning framework for instructional design in higher education to improve students' practical skills.

Multiple studies have shown the effectiveness of UDL in improving learning outcomes, especially in improving students' academic performance, engagement, and satisfaction. Although these studies showed positive results, they have certain limitations. The small sample size and lack of long-term follow-up data limit the broad applicability of the results. Reliance on self-reporting and the lack of randomized controlled trials limit the generalizability of the results. Some studies focus on case studies and lack large-scale experimental research to verify the generalizability of the results. Most existing studies are short-term, and long-term effects have not been fully verified. Furthermore, there is a lack of research on support and training for teachers to implement UDL.

Conceptual Frameworks

Based on the key research objectives of this article: Designing the piano alternative teaching based Universal Design for Learning in music. The following is the conceptual framework for constructing this article.



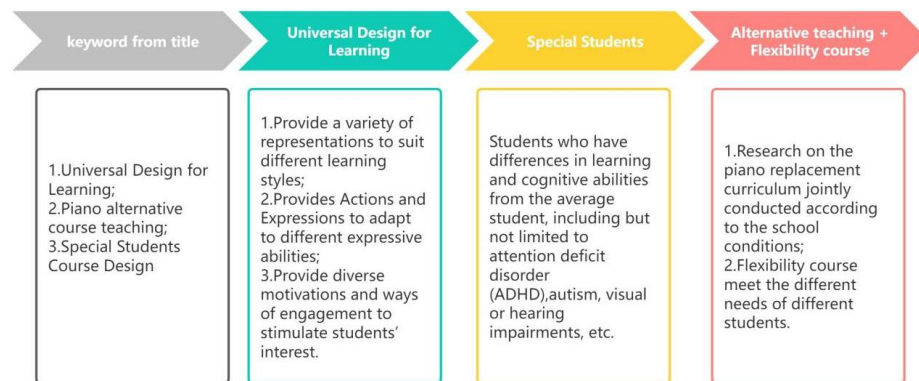


Figure 1 Source by researcher June 20, 2023

Table 1 The three core principles of UDL influence the diversity of piano course design

Provide a variety of representations.	Using multiple modes of teaching, such as visual, auditory, and tactile, helps special students understand music concepts in a way that suits them.
Provides Actions and Expressions	Provide a variety of playing methods for different students, such as tactile keyboards, simplified scores, visual aids, etc., to help students overcome physical or cognitive barriers.
Provide diverse motivations and ways of engagement	Through creativity and motivation, we design exercises and repertoires that match students' interests and increase their interest in learning the piano.

First, the core concepts related to this study were identified, and keywords that came from the UDL framework, music education, and special education theories.

Secondly, the theoretical basis of the conceptual framework is built on the intersection of UDL theory and music education theory. The three core principles of UDL influence the diversity of piano course design, thereby improving the music learning experience of special students.

Third, the matching of piano course content with special student characteristics. In summary, alternative courses should be flexible and can be adjusted to the different needs of students.

In summary, piano courses designed based on UDL can effectively improve the music learning experience of special students and improve their motivation and music performance abilities. Alternative piano courses can also be designed for different types of special students (such as autism, attention deficit, etc.), which can significantly improve their participation and expression in learning music. Of course, we also need to consider the key variables involved in the research, such as independent variables: curriculum design; dependent variables: student



performance; mediating variables: student characteristics, etc. These will pose new challenges to our curriculum design.

Definition

Universal Design for Learning (UDL): A way of thinking about teaching and learning that helps all students have an equal opportunity to succeed. This approach offers flexibility in the way students access material, engage with it, and show what they know. Developing lesson plans this way helps all kids, but it may be especially helpful for kids with learning and attention issues.

Piano Alternative Course teaching: It can provide layered teaching for normal students or students with physical and technical disabilities, provide multiple ways of understanding, provide diverse behaviors and expressions to guide the setting of appropriate goals, and provide diverse ways to encourage students to persist in their hard work. To increase interest in piano learning.

Special Students Course Design: What students need are teachers who can cope with diversity to meet the different requirements of different students. Teaching content design, teaching method design, and teaching environment design for student diversity must be an important part of teaching and activity design.

Methodology

This research combines quantitative and qualitative research, through in-depth interviews and participant observation, this paper conducts qualitative research, conducts content analysis, and case analysis on the phenomena and problems existing in the current general piano courses in colleges and universities. After the questionnaire survey and expert for course feasibility assessment. The conceptual framework of UDL was exploratory and applied to actual piano courses to quantitatively study the feasibility of the course.

In the selection of interviewers and participants, a random sampling survey was used, so that the sample is more random and can better reflect the overall characteristics and problems of the current general piano teaching model in colleges and universities. It ensures the reliability of the data and improves the generalizability of the analysis results. In the selection of participants, we chose special students with different degrees of learning disabilities and their teachers and parents in ordinary music colleges.

The interview adopted a semi-structured interview and identified the core issue of "problems encountered by the existing teaching model in the context of student diversity and how to solve them". At the same time, the interview guide also includes a series of open-ended questions, encouraging respondents to express their views, experiences, and emotions. The





interviewer can flexibly and in-depth explore the issues based on the respondents' responses. There are 16 questions in total and the duration of each interview depends on the specific situation but is usually around 45 minutes, which allows the interviewee to cover important content and gives them enough space to express themselves, ensuring that meaningful data is obtained.

July 15, 2024, The UDL Piano Alternative Course Teacher Forum is a collaborative meeting designed to integrate Universal Design for Learning (UDL) principles into piano education. The workshop was divided into several main activities, including reflective discussions, hands-on practice sessions, and peer feedback opportunities. The main focus is to help piano teachers adapt their teaching methods to be more inclusive to suit different learning needs and styles. During the workshop, participants engaged in exercises to reflect on current teaching practices and explore how UDL principles (e.g., multiple modes of participation, representation, and expression) can be applied to music education settings. Teachers are encouraged to share their experiences and challenges, creating a collaborative environment where practical solutions can be discussed and tested. At the same time, participant feedback was continually solicited and incorporated into workshop outcomes, as the data and insights gathered from participant feedback can be used to improve and advance UDL applications in music education. This iterative process of feedback and reform can help develop more effective instructional practices that can be widely applied across educational settings.

In the process of developing the piano alternative course under the UDL framework, qualitative data mainly came from interviews with teachers and students, focus group discussions and responses to open-ended forms. To analyze the data, the researcher used the thematic analysis method, adjusting all the data into text form, and collecting and organizing them for further research. The analysis of quantitative data generally involves descriptive statistics. By combining qualitative and quantitative data, researchers can validate findings from different data sources. In addition, the researchers cross-validated the themes extracted from the qualitative analysis with the quantitative data results to confirm whether the two were consistent. The comprehensive data analysis method ensures that the research results of the piano alternative course development process under the UDL framework are reliable and valid, which is conducive to further research.

In this study, addressing ethical issues was crucial to ensure that the research process met ethical standards and protected the rights and privacy of the participants. First, the researchers obtained the participants' informed consent and provided them with a detailed informed consent form, which included the purpose and background of the study, emphasized the rights of the participants, and explained all data uses. After receiving this information, participants signed the



informed consent form to express their consent. Secondly, when collecting and processing data, the anonymization of the participants' data was ensured, and finally approved by the Ethics Review Committee.

The use of mixed research methods (a combination of qualitative and quantitative research) in this study was able to meet the research objectives well. Specifically, mixed methods research was applied to explore two main research objectives. Investigation of individual differences among special students and research alternative piano teaching courses. Research focuses on understanding how specific individual differences in students' experiences, such as learning disabilities, and perceptual or cognitive ability differences, impact music learning. Therefore, through qualitative research, surveys and discussions can be conducted to fully understand students' needs. Quantitative research can play a role in the multi-dimensional evaluation of course effects in the design of general music courses based on piano substitute teaching. Through mixed research methods, researchers can systematically and deeply explore piano teaching courses under the UDL framework, ensuring that the designed courses are both adapted to individual needs and can be effectively promoted to adapt to a wider group of learners.

The main research methods are as follows: The Universal Design for Special Students' Alternative Piano Course is designed for college minor students majoring in piano.

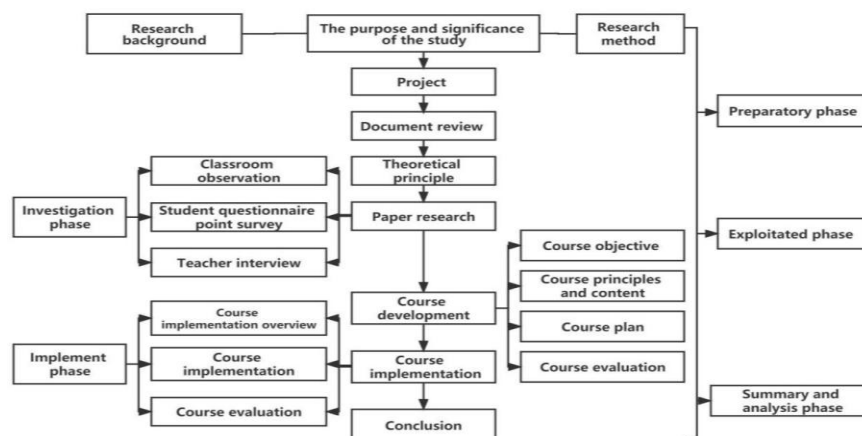


Figure 2 Source by researcher July 14, 2023

Research scope

Scope of Place: second year at Faculty of Music, Bangkokthonburi University

Scope of Content: Through interviews with special students, teachers, and their parents, we know the problems that restrict the learning effect of students in general teaching, In the face of the existing problems, the general teaching design is used to construct an alternative teaching framework, with a 14-week flexible piano course.



Scope of Time: From September 2023 to June 2024

Results

According to the 2 research purposes: (1) Surveying special students' differences and studying alternative piano teaching courses. (2) Designing the piano alternative teaching based on Universal Design for Learning in music.

Surveying special students' differences and studying alternative piano teaching courses.

To comprehensively understand the teaching perception and teaching needs of students and teachers as well as the problems faced by teaching, we first conducted a survey and interview with the parents and teachers of the special students in the second year of the Music Faculty of BabgkokThonburi University, Thailand and China on the School of Music of Lanzhou City University.

Table 2 Interview with key informants (Time, place, name, Interview method)

Date	Place	Key informants	Interview form
Week 1	Bangkok Thonburi	Teacher A (Alias named)	Semi-structured Approach
Week 2	Lanzhou City	Teacher B (Alias named)	Semi-structured Approach
Week 3	Bangkok Thonburi	Parent of a child A (Alias named)	Semi-structured Approach
Week 4	Lanzhou City	Parent of a child B (Alias named)	Semi-structured Approach

Note: Alias named for ethical on Teachers and Parent A and Parent B, whose children are studying at Thailand BangkokThonburi University and China at the School of Music of Lanzhou City University.

The interview content includes four aspects: the first aspect is the individual characteristics of the survey subjects, and the basic situation includes the gender, grade, major, and region of the survey subjects; the second aspect is the survey subjects' satisfaction with the current classroom teaching model and the reasons; the third aspect is the factors affecting the quality of classroom teaching; the fourth aspect is the respondents' own experience and methods of learning under the existing teaching model, and whether they are willing to participate if a new alternative course based on the UDL framework is adopted, which can meet the diverse needs of all students as much as possible, has flexible and diverse assessment standards, and provides

guidance on diverse presentation methods.

Survey Results: It is not difficult to find from the interviews with key informants that in the context of teaching integration, every teacher will encounter special students with different learning abilities in classroom teaching. They learn music in class with normal students, but the traditional music teaching model limits their learning pace. Therefore, in actual classes, teachers will make corresponding adjustments in classroom teaching materials, course evaluation methods, and teaching model selection according to the student's situation.

Table 3 Interview with key informants

Name	Major	Regarding whether you can meet students with special learning needs or different learning abilities in the classroom	On whether traditional teaching materials can meet the needs of special students	Can the traditional classroom teaching model adapt to the current context of educational integration?	Are unified assessment standards fair to students with special needs?
Teacher A (Alias named)	Saxophone	In class, they often encounter special students, who have short tongues, tongues problem on wind blow	No, the teaching materials are single and cannot be suitable for every learner. It makes students feel unable to achieve their goals, feel frustrated, and lose motivation to learn.	No, it will be unfair to special students, and adjustments will be made accordingly to teach her alone.	Not fair, so the Exam Go Out for a Show will be adopted.
Teacher B (Alias named)	Piano	In class, I often encounter special students, who can't control my emotions and shout, but he has a good memory.	No, the teaching materials are monotonous and lack selectivity, making it difficult for students to learn.	No, it will be unfair to special students, and I will make corresponding adjustments. I will divide the class into groups, and you can get help	Not fair, so Exam can choose Group teaching



Name	Major	Regarding whether you can meet students with special learning needs or different learning abilities in the classroom	On whether traditional teaching materials can meet the needs of special students	Can the traditional classroom teaching model adapt to the current context of educational integration?	Are unified assessment standards fair to students with special needs?
				from my classmates in the learning process.	
parent A	Piano, Saxophone	He can play instruments very well, but there is no way to learn music theory. Students have difficulty adjusting to the new teacher.	No, most of the teaching materials are suitable for ordinary children to learn, and there are no teaching materials designed specifically for special students.	No, it's not fair to special students, so his teacher will choose the teaching content according to the child's acceptance degree.	Unfair, but there is no way, still to take a collective examination, so a lot of subjects are unqualified.
parent B	Piano, Saxophone	He had no eye contact, communicated with ordinary people, or read their feelings. But he has a good memory.	No, children cannot choose music they are good at, which will make them feel frustrated and lose interest in learning.	Cannot adapt to the traditional teaching model, so First we let the child learn enough basics with a special education teacher so that the child can start learning with a regular teacher. Let the child practice slowly and don't put too much pressure on him.	Unfair, but there is no way, still to take a collective examination, so a lot of subjects are unqualified.



Through the analysis of the interview results, the following problems are found in the existing traditional piano lessons, and the factors affecting the teaching quality are as follows:

Table 4 The researcher analyzed the results of the interviews

Targets	Interviews
Teaching materials	Traditional classroom teaching materials cannot give full play to students' initiative. To improve students' independent learning, it is necessary to teach students by their aptitude and provide a variety of teaching materials to choose from. The more complete the relevant materials are, the more students can fully understand the course content, have their thoughts on the course content, and effectively participate in the course teaching, thereby improving the teaching quality.
students' independent learning ability	Students may show differences in the process of independent learning. These differences can be mainly reflected in the following aspects: different learning styles and preferences, different learning speeds, different learning goals and motivations, different learning strategies and Different utilization of resources, etc. These differences reflect the unique needs and learning styles of each piano student in the learning process. Piano teachers can help students realize their music by understanding and respecting these differences and adopting appropriate teaching strategies and support measures. Personalized and holistic development of learning.
teachers' organizational ability	The teacher's organizational ability is the key to improving students' independent learning ability. Effective monitoring and timely guidance are crucial to improving teaching quality. Let students participate in course teaching and encourage them to learn in a way that suits them, not just one model. To make every student feel that they will not be left out, this requires the teacher's teaching organization art.
Course assessment requirements	The course assessment requirement is to test the student's learning situation. A single unified assessment standard is not conducive to the development of the course. Students have different abilities. Personalized and open assessment standards have both certain constraints and incentives for each student and are conducive to improving the quality of teaching.
Choice of teaching mode	The traditional teaching model is based on the transmission of knowledge, focusing too much on the teacher's explanations and lacking in diversity and interactivity; in addition, this teaching model ignores the differences of students, making it difficult to meet the different learning needs of various students. Therefore, according to students' abilities, interests, and learning styles, teachers need to provide a variety of alternative learning resources, encourage student cooperation, and promote student participation.

The survey results show that in the context of educational integration, creating a fair and inclusive learning environment for all students must adapt to the diversity of student's





independent learning abilities, so teachers' organizational skills are particularly important. The Universal Design for Learning (UDL) framework emphasizes the importance of personalized learning and differentiated instruction. One of its core principles is to provide multiple ways to engage in learning, express understanding, and demonstrate learning outcomes. This principle is particularly important in general piano teaching. Because each student has a different learning style and ability, different students may have great differences in this ability. Some students may be better at self-motivation and can practice and solve problems independently, while other students may need more guidance and support. UDL advocates providing flexible learning paths for different learners. Understanding and respecting the differences in students' independent learning abilities allows teachers to more effectively design appropriate learning plans for each student and encourage them to progress at their own pace. We also focus on cultivating students' independent learning ability, which can help them become more independent in their future studies and life. This ability is not only useful in music learning but also indispensable in the entire education process and future career development.

In terms of teachers' organizational skills, they need to effectively coordinate between diverse learning needs and goals within the framework of UDL. They need to be able to quickly adjust teaching strategies to adapt to students' feedback and progress. Teachers also need to integrate and utilize a variety of teaching resources within the UDL framework, such as music scores of different difficulty levels, video tutorials, and interactive exercises, to ensure that students have access to materials that are appropriate to their learning styles and abilities. All students, regardless of their background or ability, have the opportunity to succeed. This requires teachers to not only have strong organizational skills but also the ability to continuously reflect on and adjust their teaching methods.

Interview Insights: Analyze and Classifying the problems: After the interview, special students are individually different, the researcher found that they are classified into the following three levels:

Table 5 Researchers categorize learners based on the UDL model

Level	Categorize learners based on the UDL model
Level I	Interested in piano learning, with initial motivation and confidence. Able to ensure accurate recognition of music scores, and basic accompaniment methods, play simple melodies, and sing the learned music on the piano (special students can receive differentiated teaching through various presentation methods such as CURWEN gestures and written music scores). Able to learn with others. (Special students are allowed to choose partners). Able to play simple music. (Students with special needs can choose music that they are capable of with





Level	Categorize learners based on the UDL model
	the help of their teachers.) Able to set reasonable piano learning goals and learning plans with the help of teachers.
level II	Clarify the goal and significance of piano learning and have strong self-confidence in piano learning. Can play the music in the teaching materials with emotion and learn the relevant knowledge in the teaching materials independently Can cooperate with others to learn well. Can set reasonable piano learning goals, learning plans, and learning progress with the help of teachers. Teachers should fully understand special students' abilities, think about how to best attract their attention, be good at discovering students' enthusiasm for learning in specific areas, and carry out extended exercises with the help of the teacher.
level III	Have clear motivation, learning goals, and strong self-confidence for piano learning. Be able to play the music in the teaching materials skillfully and emotionally, learn the relevant knowledge in the teaching materials, and apply it properly. Be able to play on the stage skillfully and calmly (special students can choose a familiar classroom environment or an external environment to perform) and can also cooperate with others as a piano partner to perform vocal and instrumental music. Have a certain cross-cultural awareness. Be able to collect and use music learning resources. Have clearer goals and plans for the future. Be able to self-monitor the piano learning process. Have the ability to learn piano throughout life.

Table 6 Researchers categorize the learning needs of special students

Classification focuses on special student		
Level I	level II	level III
Students with Autism Spectrum Disorder (ASD) have difficulty understanding non-verbal cues (such as facial expressions or tone of voice) and may show delays or abnormalities in their language expression.	Students who have difficulty concentrating for long periods and are easily distracted (ADHD). They may not be able to focus on one task continuously while studying and frequently switching from one task to another.	Students with visual impairments (including partial vision loss and complete blindness) often have stronger auditory perception and tactile sensitivity, which can be and advantage in music learning, especially piano learning.
A. Simple music.	A. Emotionally	A. confidence
B. Help of their teachers (give clear and direct instructions)	B. Relevant knowledge	B. expressive force
	C. Can cooperate	C. Stage skillfully
	D. Able to progress with the help of teachers (designing shorter and varied activities, creating a supportive and encouraging learning	D. Calmly
		E. Build understanding and expression of music.



Classification focuses on special student

Level I	level II	level III
environment)		

Table 7 Alternative piano course design for different types of special students:

For students with autism	Designing exercises with a fixed rhythm and high repetition helps them feel safe in the rules. Respect their unique learning needs and characteristics.
For students with attention deficit	Short, high-frequency exercises combined with game elements can enhance their attention and engagement. A combination of dynamic and static exercises, as well as a clear course structure and objectives
For visually impaired students	Use tactile or audio materials for verbal instruction instead of visual input Special attention is paid to auditory learning, tactile cues, memory-based teaching methods, and the gradual development of rhythm and structure.



Figure Demonstrated as backbone teacher by Li Ou on piano and piano Alternative Course open class



Figure Backbone Teachers Use Piano Alternative Course to teach students



Figure 3 UDL Piano Alternative Course Teacher Forum, guided by Li Ou Expert. (Li Ou, interview July 16-17)

Implications for Teaching Practice: In response to the above problems, researchers proposed a new teaching model: new course development should follow four basic issues: establish goals, select experience, organize experience, and evaluate results. Based on these four basic issues, this study divides the development ideas into four aspects: Course Objectives, Course Syllabus, Course Plans, and Course Evaluation.

The development objectives of this course are divided into overall objectives and graded objectives. The overall objectives are the overall requirements of this course, the teaching objectives are specific, and the learning objectives are the objectives that students choose to suit themselves.

Table 8 Conceptual of Alternative Course


Problems	Rethinking for Alternative Course
Single teaching materials	Teach students by their aptitude and provide a variety of teaching materials to choose from
Diversity of students' autonomous learning abilities	Understand each student's learning ability and guide students to fully understand the course learning content and everyone's expected goals.
Teacher organizational skills	Effective monitoring and timely guidance
Unified teaching assessment standards	Establish personalized and open assessment standards based on students' different abilities.
+	
Bring the important theories of a book into the new course	
Figure Citation Designed by the researcher. Kay M. Price, and Karnal L. Nelson. (2016).	
	
A Course Description B Course Syllabus C Teaching plan	

Table 9 Alternative piano course design plan for different types of special students:

For students with autism	Designing exercises with a fixed rhythm and high repetition helps them feel safe in the rules. Respect their unique learning needs and characteristics.
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For students with attention deficit	Short, high-frequency exercises combined with game elements can enhance their attention and engagement. A combination of dynamic and static exercises, as well as a clear course structure and objectives
For visually impaired students	Use tactile or audio materials for verbal instruction instead of visual input Special attention is paid to auditory learning, tactile cues, memory-based teaching methods, and the gradual development of rhythm and structure.

Steps to implement the new model


Teacher Training--Course Design--Student Engagement and Feedback--Evaluation and Improvement

Designing the piano alternative teaching based on Universal Design for Learning in music.

Course Description: This alternative piano course is based on the UDL framework which provides diverse ways of engagement, diverse ways of representation, diverse ways of action and expression, and combines school reality to meet the diverse needs of students.

The learning objectives of our school's alternative piano course are divided into three levels, with increasing difficulty. Among them, the first level of learning objectives is the teaching goal, which is the minimum goal that students need to achieve. The difficulty of the second and third levels of objectives is gradually deepened to meet the learning needs of students with learning difficulties, average students, and excellent students. 9.2.2 course syllabus.

Table10 Lanzhou City University of Music Faculty Teaching Syllabus

 Lanzhou City University of Music faculty teaching syllabus			
Course Title	alternative piano course based on Universal Design For Learning		
Course category	<input type="checkbox"/> Core <input checked="" type="checkbox"/> Required <input type="checkbox"/> Optional <input type="checkbox"/> Limited	Course hour	28hours
Credits	4	Implementation Semester	Term 3
Colleges offering courses	Music Education Major at the Conservatory of Music		
prerequisite course	alternative piano course based on Universal Design For learning Basic Theory of Music Chinese and Foreign Music History and Appreciation of Works.		
curriculum objectives	Improve students' piano playing skills, understand and apply music theory knowledge, and develop students' performance and improvisation ability.		





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nature of the course	This course is a professional course for the teacher education major of the Conservatory of Music. It provides diverse learning options for students from different backgrounds, eliminates learning barriers, and achieves learning equality.
Course assessment and grade evaluation	This course is an examination subject, and the examination types provide a variety of choices. The performance, theory, or performance scores are 100 points, with regular scores accounting for 60% and final scores accounting for 40%.

Teaching plan: Based on the UDL framework of special students' alternative piano course teaching plan, Plan for 3 levels as teaching plan.

In the first 7 weeks on the Theoretical courses for 3 levels together on the ground. The purpose was to let students understand the basic content and requirements of piano courses under the basic framework of UDL how teachers could teach at different levels after fully understanding the level of students, and how to formulate effective teaching method design and teaching content design. There was an interim assessment in week 8 to give the teacher a good idea of the theoretical learning level of the students.

The practical course started in Week 9 Students were divided into three levels based on their progress in the previous weeks, and each level could choose the content they needed to complete. Teachers could help students design challenging but achievable learning goals to ensure that each student experiences a sense of success. In the classroom, Teachers used a variety of presentation methods to show teaching content, students promoted understanding through group discussions and feedback, created a supportive and inclusive learning environment, and encouraged collaborative learning and peer support.

Table 11 Lanzhou City University of Music Faculty Teaching Plan

Week	Keywords for learning units	Course model	Corresponding to the UDL framework	Teaching content
week 1	-Let students understand course content and requirements -Fully understand the students and	Theoretical courses	-Various ways of expression -Various ways to participate	-Provide text and video versions of the course syllabus and objectives. -Make timely adjustments to teaching plans and methods through feedback.





Week	Keywords for learning units	Course model	Corresponding to the UDL framework	Teaching content
	think about how to differentiate teaching		-Continuous feedback and timely adjustments	-Assess students' prior knowledge level and group students into groups.
week 2	The formulation of multi-level teaching objectives	Theoretical courses	- Continuous feedback and timely Adjustments -Flexibility and inclusiveness	How to formulate achievable learning goals for this semester based on student levels to meet the diverse needs of students from different backgrounds Ensure every student can experience the feeling of success.
week 3	General approaches to universal instructional intervention: universal instructional design and differentiated instruction	Theoretical courses	-Various expressions -Flexibility and inclusiveness -Develop students' independent learning ability	-Describe the six principles of diversity teaching design. -Similarities between Universal Design and Differentiated Instruction. -Universal design and differentiated instruction are two complementary approaches.
Week 4	Key Tips for Keeping Students Focused	Theoretical courses	-Various ways of expression -Various ways to participate	-Learn important ideas on how to help students focus on instruction and activities. -Lesson design strategies for dealing with diversity. -Engage all students in learning by asking questions. -Ending course design to cope with diversity.
Week 5	Key skills for knowledge presentation	Theoretical courses	-Various ways of expression -Develop students' independent learning ability	-Key teaching skills that affect the efficiency of knowledge presentation. -Teacher's complete and thorough explanations and appropriate demonstrations.



Week	Keywords for learning units	Course model	Corresponding to the UDL framework	Teaching content
				<ul style="list-style-type: none">-Visual supports can be used to help students “picture” the knowledge presented.-Teaching core terms and vocabulary will help students understand.-Teachers should give students effective guidance so that they know how to complete tasks.
Week 6	Key Tips for Promoting Active Student Engagement	Theoretical courses	<ul style="list-style-type: none">-Various ways to participate-Cultivate students' independent learning ability	<ul style="list-style-type: none">-Understand the importance of active engagement strategies and types of active engagement.-"Actively participatory" instructional design that addresses diversity.-"Actively participatory" design that addresses ability differences.-"Actively Participatory" design that responds to cultural differences.
Week 7	Key skills for group work	Theoretical courses	<ul style="list-style-type: none">-Stimulate learning motivation-practice social skills-increase social integration-teachers provide additional support	<ul style="list-style-type: none">-Improve students' ability to study with others through study group cooperation.-Increases chances of positive responses and immediate feedback.-Encourage collaborative learning and peer support-Meet individual differences and preferences and increase student time in activities.
Week 8	Mid-term assessment assesses students' mid-term learning outcomes.	Mid-term evaluation	<ul style="list-style-type: none">-Various expressions-Continuous feedback and adjustments	<ul style="list-style-type: none">-Provide clear assessment criteria and feedback forms.-Use a variety of assessment tools, such as class tests and groups. Projects, to keep abreast of student learning.



Week	Keywords for learning units	Course model	Corresponding to the UDL framework	Teaching content
				-Provide personalized feedback to help students identify and improve their weaknesses.
The practical course begins in Week 9. Students were divided into three levels based on their progress in the previous weeks, and each level could choose the content they needed to complete.				
Week 9	Case 1 Music theory and sight-reading, deepen understanding of music theory and improve sight-reading and Hearing improvise ability	Practical courses	-Various expression methods -Various selection methods -Various ways to participate -Develop students' independent learning ability	Music theory review, graded sight-reading exercises. -Sight-reading exercises (divided into three levels) students choose the content to be completed according to their level. -Design challenging but achievable learning goals to ensure every student can experience a feeling of success. -Promote understanding through group discussion and feedback, creating a supportive and inclusive learning environment that encourages collaborative learning and peer support.
Week 10	Case 2 Understand the musical style and expression of the Baroque period.	Practical courses	-Various ways of expression -Various selection methods -Various ways to participate -Develop students' independent learning ability	-Choose a piece of music from the Baroque period to practice (the performance difficulty is divided into three levels). Students choose what they want to complete according to their level. -Provide background knowledge to help students better understand new content. -Provide audio and video demonstrations of the music. -Use tools to help understand composition structure.





Week	Keywords for learning units	Course model	Corresponding to the UDL framework	Teaching content
				-Improve through individual coaching and group practice. -Teachers provide additional support. -Help students with special needs overcome barriers.
Week 11	Case 3 Understand the music style of the classical period and improve your performance skills.	Practical courses	-Various expression methods -Various selection methods -Various ways to participate -Develop students' independent learning ability	-Choose a piece of music from the classical period to practice (the performance difficulty is divided into three levels). Students choose what they want to complete according to their level. -Focus on practicing the technical and difficult points in the music. -Provide background knowledge to help students better understand new content. -Provide step-by-step demonstration and analysis of the music. -Use a metronome and recording tools to help practice. -Improve through individual coaching and peer feedback. -Teachers provide additional support to help students with special needs overcome barriers.
Week 12	Case 4 Understand the musical style and expression of the Romantic period and focus on improving musical expression.	Practical courses	-Various expression methods -Various selection methods -Various ways to participate -Develop students' independent learning ability	-Choose a romantic period piece for practice (the performance difficulty is divided into three levels). Students choose what they want to complete according to their level. -Focus on practicing emotional expression in music



Week	Keywords for learning units	Course model	Corresponding to the UDL framework	Teaching content
				<ul style="list-style-type: none">-Provide background knowledge to help students better understand new content-Provide step-by-step demonstration and analysis of the music-Improve through group performance and discussion-Teachers provide additional support to help students with special needs overcome barriers
Week 13	Allows students to personalize music selections and prepare for final assessments Provide individual guidance to solve personal problems	Practical courses	<ul style="list-style-type: none">-Flexibility and inclusiveness.-Develop students' independent learning ability.-Personalized guidance.	<ul style="list-style-type: none">-Comprehensive review of all designated music pieces.-Emphasis on the coherence and musicality of the piece.-Based on personalized feedback, adjust teaching focus to adapt to different students' learning speeds.-Teachers provide additional help, allowing students to identify and improve their weaknesses and set achievable goals.
Week 14	Conduct final assessment and demonstrate learning results.		<ul style="list-style-type: none">-Various expressions-Flexibility and inclusiveness	<ul style="list-style-type: none">-Perform a piece of your own choice and be evaluated.-Design a variety of assessment methods to assess students' multiple abilities and knowledge.Comprehensive assessment of students' learning outcomes throughout the semester, including performance, improvisation, and creative works.-Provide course feedback and summary.



Discussion

From July to November 2023, a piano education seminar training program based on the UDL model was conducted under the organization of the Piano Education Society of Lanzhou City, Gansu Province, China. During the conference, an expert open course titled 'Piano Alternative Course Rethinking for Special Students UDL' was held. The key teachers were trained in the basic theory of the piano program in the framework of UDL. Based on the results of the authors' interviews with special students, teachers, and parents at Thonburi University in Bangkok, it was discussed that the traditional model of piano education creates many barriers to learning for special students.

Through discussions with experts, a new curriculum was developed and utilized in the second-year general piano course for the music teacher education program at Lanzhou City College. This course is a professional course for the teacher education major of the Conservatory of Music. This course incorporates the Universal Design for Learning (UDL) framework into piano education, completely changing the drawbacks of traditional piano education that follows a linear and standardized curriculum model and marginalizes students with different learning needs (such as students with disabilities, different learning styles, or different experience levels). The curriculum under the new UDL framework encourages diverse teaching methods tailored to the individual needs of each student (Zhang, 2013), thereby increasing student engagement and motivation and ensuring that each student has multiple pathways to success. This has far-reaching implications for the field of piano education and beyond, aiming to create an inclusive learning environment in the era of educational integration to meet the different needs of all students.

However, the researchers found that this model has broader implications for music education, not only benefiting students with disabilities but also enriching the learning experience of all students by promoting diversity and adaptability but we also face challenges. Successfully implementing the UDL framework in piano education will require significant changes in teacher training and professional development. Educators must have the skills and knowledge to design and deliver UDL courses, which may involve learning how to use new technologies, adapting instructional programs to accommodate different learning styles, and developing differentiated instructional strategies. This shift will likely require the incorporation of UDL principles into college-level music education courses to ensure that future teachers can meet the diverse needs of their students. This study starts from the development of an Alternative piano course for university music education majors so that students can have theoretical knowledge of the UDL framework and practical ability in piano teaching in the classroom. They understand the UDL framework and inclusive education in the classroom and



put theory into practice. They are both beneficiaries and disseminators of the course.

Adopting UDL may also lead to potential policy changes in music education, such as changes in assessment practices, and moving away from standardized testing to more formative and personalized assessments. Implementing UDL in piano education may require additional resources, such as specialized teacher training and the development of new instructional materials.

This study is affected by such as the sample size, the specific context of the research (i.e., universities in Thailand and China), and any potential biases, there are limitations. Despite these limitations, the findings of this study still provide valuable opinions and research foundation for the development of general Alternative piano courses under the UDL framework and point out directions for future research. For future research that could build on the current study's findings. This could include longitudinal studies to assess the long-term impact of UDL-based piano courses, comparative studies between different educational contexts, or exploring the application of UDL in other areas of music education.

The piano education curriculum under the UDL framework has significant transformative potential and can completely change the traditional piano education model through diversified and personalized teaching methods. Its key findings show that the UDL framework can not only enhance students' learning experience and outcomes but also promote fairness and non-confrontation in education. With the widespread application of this framework, piano education will inspire a more innovative and compelling future in the context of educational integration.

Recommendation

Practice Recommendations

Based on the findings demonstrating the effectiveness of a Universal Design for Learning (UDL)-based piano teaching course in improving the learning environment, assessment standards, and individualized support for special students, the following practice recommendations can be made:

1. Integrate Universal Design for Learning principles into piano teaching courses. According to the research, UDL contributed to a more inclusive and adaptive environment for students with special needs, resulting in increased engagement and performance.
2. Improve Assessment Standards: Traditional assessment standards may not accurately reflect the diverse abilities and progress of students with special needs. The study suggests that teachers use more flexible and individualized assessments to better support student growth.
3. Provide personalized instruction and support based on each student's unique needs.



The study findings show that such individualized support, as framed within the UDL approach, promotes better outcomes.

4. Increase Student Engagement: Teachers should implement strategies to engage students with special needs at all levels of learning, ensuring active participation and motivation.

Further Research Recommendations

1. Long-Term Impact Studies: Future research should examine how UDL-based music education affects students with special needs. While this study found improvements after 14 weeks, it would be useful to understand how sustained engagement and learning outcomes change over time.

2. Broader Subject Application: While the study focused on piano teaching, future research could explore how UDL principles can benefit other musical instruments or arts education for special students.

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