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Exploring Significance of SPOC: A Path to Modernization of Music Cloud Computing

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Abstract

INTRODUCTION: With the development of the information age and the application of cloud computing and big data technology, new changes have occurred in the field of education. Today, the form of learning is becoming more and more diversified, and cloud computing, big data and other information technologies can be more often applied in teaching and learning. The application of cloud computing to the creation and teaching of music can not only improve the interaction between teachers and students in the traditional classroom, but also cloud computing can better capture the problems of teaching in the classroom and provide adjustment suggestions through big data.
OBJECTIVES: This study is to realize distance music teaching of SPOC through cloud computing, big data and other technologies. Further use of cloud computing technology is to improve the traditional music teaching classroom teaching and learning tools are not rich enough, the student perception is more single problem. At the same time, cloud computing technology is also utilized in order to explore the effect of distance music education.
METHODS: Based on the management of learning theory, constructivism and communicative learning theory, this paper carries out the research on music creation and teaching through the methods of cloud computing and big data, and collects and summarizes the related literature at home and abroad, researches the development of big data and cloud computing in the field of music teaching and introduces the principle of SPOC teaching that supports students' independent learning through big data technology.
RESULTS: Based on the training concept of MOOC and cloud computing, the teaching process encourages teachers and students to apply the pedagogical methods of cloud computing to improve the level of music nowadays teaching and learning at the same time, improve the overall quality of students.
CONCLUSION: Music aesthetics education has diversity, SPOC learning process and cloud computing technology should be developed by developing an independent learning method. Therefore, cloud computing technology can help students learn music independently in a three-dimensional way, effectively develop the design stage of the learning process, use big data and cloud computing to better enrich the music teaching model, and implement the construction of independent knowledge. Future research can continue to develop towards empirical evidence and a large number of data experiments.

Keywords: SPOC, cloud computing, music modernization, salience exploration

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1. Introduction

Technological innovations have brought progress and societal changes and contributed to educational reform. The rapid development and widespread application of information technology that fully uses human intelligence is gradually changing the creation and transfer of knowledge, influencing profoundly changing talent needs and learning methods (Aithal et al., 2021). New Internet concepts and technologies have recently permeated every

corner of the education ecosystem. The rapid development of new information technologies, such as big data and blockchain, has contributed to this era of rapid growth. The information society has become a driving force for educational reform, and digital education reform has become a new trend in international educational development. There have been profound changes in teaching styles, exposure, curriculum, pedagogy and leadership. In March 2022, the Ministry of Education announced the importance of digitizing the education system by 2021 to use online technologies to translate educational decisions into information as quickly as possible. The announcement issued by the Ministry of Education in January 2019 clearly emphasizes the need for the authors to focus on the main tasks of the residents of Reid to ensure the construction and use of space through new dynamic mechanisms in the development process(Paganelli, 2021). The aim of improving learning management should be to improve educational knowledge and bring innovation to new forms of e-learning. They are considering educational ecology in light of new educational goals and developing new educational methods to meet them.

SPOC is a new model of learning based on web-based thinking. Traditional methods of teaching listening are gradually merging into personalized, versatile and independent learning models. With the development of information technology and education, learning resources are becoming increasingly global and learning methods are becoming increasingly diverse. In today's ever-changing and changing information age, there is a need to focus on developing students' self-learning skills to meet the diverse educational needs of modern social competencies.

However, the cognitive abilities, psychological characteristics, and learning and thinking levels of high school students vary considerably compared to the study participants. Therefore, there is a need to expand the scope and range of the study and deepen the pedagogy of the SPOC comprehensive school. Complementing the theoretical results of SPOC learning spaces in integrated schools opens new perspectives on SPOC learning environments. The combination of SPOC and music education improves the structure of high school music education and makes teaching music independent and exciting. In the MOOC environment, teachers prefer SPOC-based portfolio learning. In the era of the knowledge economy, improving students' self-learning skills is essential to organizing SPOC music courses in secondary schools. This paper explores the principles, instructional levels, and evaluation of SPOC instruction in secondary music education using literature-based and hands-on research approaches. This paper explores the mechanisms of SPOC learning methods in improving education, and the use of SPOC learning models helps to create a new teacher-student relationship. Taking advantage of the great strengths of IT, SPOC aims to provide various elements from online resources, platforms, mobile and cloud spaces to music education. We are meeting the educational needs of each student and allowing the transition from mobile Internet education to SPOC.

In the SPOC learning model, teachers and students can share quality music resources worldwide and use them effectively. With the help of information technology, various resources in music education break the boundaries of time and space, optimize music teaching formats, facilitate the exchange of music-teaching experiences among students, and promote new music content(Toklucu E, 2022).

Based on learning theory, constructivism, and communicative learning theory management, this paper presents the principles of SPOC instruction that support student-directed learning and proposes strategies to improve this learning style by collecting and summarizing relevant domestic and international literature on high school students.

In the remaining part of this paper, we first introduce the relevant theories; secondly, we establish our model based on the theories and basic methods and clarify the research logic of this paper; finally, we conduct relevant tests on the research content of this paper through experiments, and come up with the "Significance Exploration of SPOC: Modernization of Music Cloud Computing" of this research(Al, 2021). Finally, the experiments were used to test the research content of this paper and the path of "SPOC Significance Exploration: Music Cloud Modernization" was concluded(Russia, 2021).

2. Related Work

Theoretically, it describes the research, construction, feasibility analysis, extension and reflection of the SPOC learning model. Analyzing different learning cases demonstrates four significant advantages of SPOC in the classroom: first, it plays a vital role in improving the brand impact of universities and colleges, improving the quality of teaching and learning, and reforming teaching methods in schools, optimizing the educational format.4 In an academic dialogue with Professor Fox, the founder of the SPOC concept, Xu Wei and Jia Yongqiang discussed the SPOC's importance and future of development; modern education is more the product of deep integration of open online courses and physical courses. From the teachers' perspective, the direction of building the SPOC learning model is illustrated from three aspects: learning concept, learning process and learning evaluation. Comparing the background and characteristics of MOOC and SPOC, SPOC also solves the problem of students; the need for more learning motivation provides new opportunities for fundamental education reform. By combining the online and offline learning practices of SPOC, Yanhua Tang suggests continuously improving classroom physics online and offline by using the online resources available in the SPOC learning model and combining them with the advantages of student-centered learning. Educational

knowledge, effective class size expansion, and meeting student needs; individual learning needs. Xiaoxia tested the SPOC learning model with the Rain Course tool, summarized several problems in the reform of the traditional learning model, and proposed solutions and recommendations.

The applied research of SPOC is mainly reflected in the teaching practice of different disciplines. Sen Hao studied the application of the SPOC learning model in a physics course at Shanxi University. At the end of the training, he found that combining online and offline SPOC models effectively improved students' physical examinations and mobilized intrinsic motivation and seriousness in the learning process. Xuying Yang targeted second graders in Hangzhou to teach English in secondary school using the SPOC model. Chao Xie used the example of art and design courses at universities and colleges, both of which study online and offline blended learning abroad, and noted the positive impact of the SPOC learning approach on students' independent learning skills in the era of educational knowledge. This better meets China's outstanding universities' cultural and design needs (Spocter, 2022).

As early as ancient Greece, researchers have analyzed the critical concept of independent learning. According to Socrates, the primary task of teachers is to help students learn, not to use them as a repository of knowledge. The committee also emphasized the importance of self-directed learning and the need to fully respect and understand students' interests in the learning process. Promoting students' positive knowledge gives them a positive internal experience and helps them develop a sense of self-authorship cognition. The French teacher Rousseau also believes that good education should appeal to students' interests. The authors strongly oppose compulsory and obligatory education, encourage students to experience and practice the learning process, and gradually develop their academic independence through active research.

3. Research methods

3.1 Basic SPOC method

Browse relevant online databases, find keywords such as "SPOC model," "offline learning model," and "SPOC music learning model," and read relevant books and materials(Tetteh et al., 2022). Then, we learned about using SPOC learning models in different subjects at home and abroad and their effects on self-learning ability. By analyzing and synthesizing relevant literature, strategies to improve students' self-learning abilities in SPOC music classes were proposed, and the concepts of SPOC and independent learning were developed. The case study approach includes targeted, in-depth, and relevant research and analysis of specific topics, such as individuals, organizations, or groups, and the study of their behavioral characteristics and processes. This study was conducted with two classes in Beiling District High School in Xi'an. Students' independent learning was recorded and analyzed at any time using SPOC in the music curriculum(Ali Muhammad, 2021). By practicing the music curriculum, you will learn about the issues associated with providing music lessons and lay the groundwork for the sound use of the SPOC instructional format in school music programs.

SPOC standard truth model indices:

$$X'_{\lambda ij} = \frac{X_{\lambda ij} - \min X_{\lambda ij}}{\max X_{\lambda ij} - \min X_{\lambda ij}} \quad (1)$$

Equation (1) better calculates the mean value of the unknowns by calculating the maximum and minimum values of a set of unknowns.

$$X'_{\lambda ij} = \frac{\max X_{\lambda ij} - X_{\lambda ij}}{\sum X_{\lambda ij}} \quad (2)$$

The formula uses the standard low-rank method to calculate the logarithms to process the data, so the denominator part is not the standard sum of differences but the overall sum.

$$Z_{\lambda ij} = X'_{\lambda ij} + \gamma \quad (3)$$

In formula (3), the random perturbation term is added due to the randomness of the unknown number.

A test form is a method of collecting data. A group of researchers collected the questionnaire and sent it to the respondents. The survey is widely used, and its main advantages are simplicity and economy. In this study, the authors selected standard high school sophomores in the Bell district of Xi'an. They developed a questionnaire based on the new standards for high school music, which was sent to the class through an electronic link in a QQ group(Tran et al., 2022). Finally, a questionnaire was analyzed and compiled to provide a practical basis for further research on music education models.

3.2 Research Logic

Theoretically, it describes the research, construction, feasibility analysis, promotion and reflection of the SPOC learning model. Analyzing different learning cases demonstrates four significant advantages of SPOC in the classroom: first, it plays a vital role in improving the brand impact of universities and colleges, improving the quality of teaching and learning, and reforming teaching methods in schools, optimizing the form of education.4 In an academic dialogue with Professor Fox, the founder of the SPOC concept, Xu Wei and Jia Yongqiang discussed in 4 the importance and future of SPOC development, where modern education is more a product of the deep integration of open online courses and physical courses. From the teachers' perspective, the direction of building the SPOC learning model is illustrated from three aspects: learning concept, learning process and learning evaluation. Comparing the background and characteristics of MOOC and SPOC, SPOC also solves the problem of students; the need for more learning motivation provides

new opportunities for fundamental education reform. By combining the online and offline learning practices of SPOC, Yanhua Tang suggests continuously improving classroom physics online and offline by using the online resources available in the SPOC learning model and combining them with the advantages of student-centered learning. Educational knowledge, effective class size expansion, and meeting student needs; individual learning needs. Xiaoxia tested the SPOC learning model with the Rain Curriculum tool, summarized several problems in the reform of the traditional learning model, and proposed solutions and recommendations. The SPOC focuses on students' ideas; it is a reasonable basis for future educational reform and development. In Exploring School Curriculum Building, Gangming Lin explains the future of SPOC from the perspective of SPOC. With the development of e-learning methods such as MOOC and SPOC, SPOC-based learning models encourage student-oriented learning, which helps optimize the effectiveness of classroom instruction.

The model will be treated uniformly, so the following equation provides the overall approach.

In addition to the theoretical foundation, this paper examines the importance of developing independent music learning skills in secondary school students(Alsharari, 2022). This study uses the SPOC method for teaching secondary school music to general high school students in the Beilin District of Xi'an. By analyzing students' online and offline music learning behaviors, the authors studied and researched music teachers and proposed issues and strategies to improve online music learning for high school students, laying the foundation for online music learning in school music classes.

The model is to be treated uniformly in the model, so the following equation provides the overall approach:

$$P_{\lambda ij} = \frac{Z\lambda_{ij}}{\sum_{\lambda=1}^{h}\sum_{i=1}^{m} Z_{\lambda ij}} \quad (4)$$

During the unified processing, specific needs to be comprehensively processed, and the results are as follows:

$$E_j = -k\sum_{\lambda=1}^{h}\sum_{i=1}^{m} P_{\lambda ij}\ln P_{\lambda} \quad (5)$$

The following models are mainly used for the self-directed learning setting and testing:

$$y_t = \phi_1 y_{t-1} + ...\phi_p y_{t-p} + Hx_1 + \varepsilon_t, t = 1,...,T \quad (6)$$

The model mainly comprises endogenous and exogenous variables and random disturbance terms.

$$C(L)y_t = u_t, E\left(u_t u_t'\right) = I_k \quad (7)$$

In equation (2): $C(L) = C_0 - \tau_1 L - \tau_2 L^2 - ...\tau_p L^p$.

3.3 Pre-course research design

The development of training activities is the basis for determining the training objectives. It partially controls the direction of learning and operates dynamically throughout the learning process. Applying the SPOC pedagogy, the overall objectives of the course are determined especially according to the national curriculum requirements, students' learning abilities, subject characteristics and learning environment. Secondly, each chapter and module is designed based on common learning objectives, focusing on incorporating learning processes and methods to ensure effective implementation and enforcement of the learning objectives. Teachers must follow the course content to determine what is appropriate for online and offline learning and analyze and organize the content of each course to find the most appropriate teaching methods. Depending on the nature of music education, not all content is suitable for e-learning, so teachers need to analyze the specific content of each module or section.

The SPOC learning model is an interactive learning process between the teacher and the students, mainly in the form of independent learning in preschool and interactive learning in the physical classroom. In the SPOC learning model, offline spreadsheets remind teachers of course objectives and student teaching instructions and help teachers organize their classes effectively. Teachers can use the to-do list comments to learn about students' problems and issues in self-study. A separate task list can be distributed to students electronically or as a document(Wang, 2022). The self-directed learning task list includes project name, target achievement, learning tasks, learning outcomes, questions, and self-authorship assessment. Therefore, when developing the educational task list, attention should be paid to the specificity of the music discipline. When formulating educational objectives, students' emotional resonance is stimulated, aesthetic imagination is developed, and their positive musical experience is deepened.

3.4 Data Collection and Questionnaire Design

The primary purpose of this study was to understand the acceptance level of SPOC music courses, the effectiveness of self-study, and the learning satisfaction after learning to provide a practical basis for further music education. The researchers studied 95 high school students, 40 male and 55 female, who led SPOC music education between the ages of 15 and 16 in the Middle Ages.

Based on the new standards for high school music education, the authors developed a questionnaire that included four areas: attitudes and emotional values, processes and methods, knowledge and skills, and overall satisfaction.

To understand students' perceptions of the impact of SPOC on music learning, the authors developed a well-designed questionnaire on the effects of high school music instruction using Big Data Star Analytics. They administered it over two years by posting an electronic link in a QQ group. The accuracy rate of the distribution questionnaire 95 and the basic questionnaire 95 should be 100%.

4. Experimental results

4.1 Modernization theory experiment of SPOC

With the development of the information society, the authors recognize that information technology has had an unprecedented impact and challenge on humanity and the world. In today's rapidly developing society, the rapid development of Internet technology and the continuous addition and improvement of related theories have promoted the development of a new generation of artificial intelligence(Blackwell et al., 2023). However, there are still many gaps in the development of the contemporary education field. Although education development has evolved from information technology 1.0 to today's 2:00, there is no more optimized education model after some education model development. Since the development of MOOC, there is no better one. MOOC is an e-learning platform that fundamentally updates learning through open online courses. Its emergence has opened the door to the renewal of the global education model.

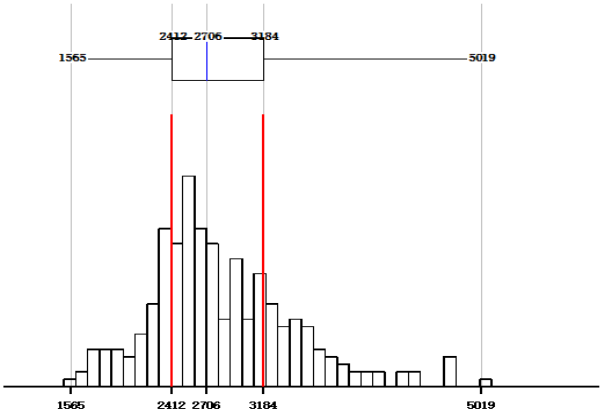

Figure 1 Study of MOOC diversity trends

As shown in Figure 1, a study of MOOC diversity trends, the MOOC platform has become a benchmark for excellence in learning. MOOC shifts teaching and learning from classroom to classroom, providing a more comprehensive range of learning opportunities and educational needs for students of all ages. In China's educational development, our education does not only include the traditional elementary, middle, high school, and university education; our country also includes a multi-level talent selection mechanism and related education, sports, music, art and other selection mechanisms in various educational fields. Therefore, more than simple online courses are needed to meet our country's multi-level and multi-faceted learning needs (Xiao et al., 2021). To further develop a new educational concept that better responds to the current form of education in China, the SPOC educational concept can be an excellent solution to China's current multi-level, multi-faceted educational needs. However, MOOC still has certain advantages. Interesting MOOCs have been criticized for their high actual investment costs, low graduation rates, difficulties in individual learning, high dismissal rates, lack of scale restrictions, consistency in learning methods, poor adaptation to educational content, and lack of emotional values and humanistic development MOOCs are an online learning method(Chen et al., 2021). Although time and space are not limited, problems are difficult to address and discuss in real time with many students worldwide.

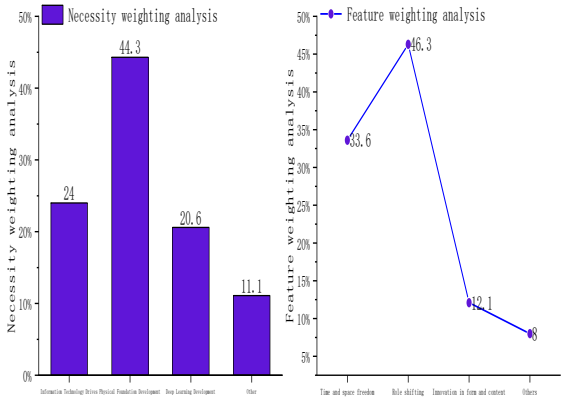

Figure 2 Weighting analysis of SPOC inevitability and characteristics

As shown in Figure 2, this paper analyzes the weight of SPOC inevitability and characteristics, based on which a micro-effective method for studying SPOC networks is proposed. In addition, according to a study conducted at the University of California, Berkeley, public university programs have little to no impact on college sports(Loi et al., 2022). He noted that the model is a mini-learning model, a new hybrid model that combines e-learning with the traditional classroom (i.e., online resources), using the MOOC as a classroom tool in instructional videos, and then incorporating individual differences between students and the classroom. The "small" and "private" nature of the office contrasts with the "large" and "open" nature of the large open category. "Small" refers primarily to a limited number of students, usually between a few dozen and a few hundred. "Private" refers to the conditional selection of subjects. The program targets specific groups.

Only students who meet the admission requirements can access the learning platform. Therefore, the office has a degree of confidentiality. At Spock, the original IOC resources are only used for specific groups. As the SPOC

space spreads and evolves in the classroom, a particular form of SPOC combines MOOC videos, online grading networks and online platforms with traditional learning.SPOC is an innovative theory of knowledge education and teaching. It challenges the traditional learning space, transforms the traditional classroom teaching space, teaching methods, pedagogy and teaching methods, integrates and integrates various online video learning resources, violates space and time constraints, and implements online and offline learning. With the help of computer technology, SPOC offers students the opportunity to learn anytime and anywhere, opens up new horizons and directions for primary education, and provides new ideas and insights for improving the quality of integrated schools. It is intellectual training for the information and network age. It fully uses the connection between the Internet and the education system to create a new model of open and diverse education. According to Zhu Zhiting, Liu Mingzhuo and others, the starting point of SPOC is to reform the unreasonable teaching forms and teaching concepts of traditional classroom teaching to increase students' creative intelligence. It is an education and training reform to adapt to the challenges and impacts of the information society on education and training.

Table 1 Differences between traditional catechism and SPOC online teaching

	Catechism	SPOC Distance Learning
Entry criteria	Unlimited	Specific population
Teaching model	Autonomous learning	Multiple forms
Teaching scale	Large scale	Small scale
Teaching evaluation	Online examination	Online and offline combination
Teacher guidance	less	more

According to the authors, the development of online or mobile technologies has led to a form of learning that "supports e-learning." Supporting e-learning aims to provide technical support for learning collaboration. This can be defined as multidisciplinary integration. It is the best combination of traditional learning and e-learning. It discusses how information technology can contribute to self-directed learning. Schools ' technological and vocational training programs are based on a blended learning model that integrates advanced concepts and materials. In short, SPOC is an organic combination of MOOC resources and classroom teaching. It is a combination of "platform technology" and "classroom teaching"; MOOC is the foundation of SPOC, and SPOC is the future direction of MOOC.

4.2 Experimental results of self-directed learning theory

Hawk researchers introduced the concept of self-directed learning in the 20th century. Self-authored learning can be considered as a whole. Through self-authored observation, cognitive management, motivation and behavior, students can set and achieve learning goals and increase people's intrinsic motivation. Thus, in traditional offline transmission education, the learning process means that the teacher transmits knowledge to the student through various ways and means, and the student is a receiving subject. In today's self-directed learning theory, the student becomes a master of information, seeks it out, and develops it independently. Through this process, the student learns and understands the outside world primarily through self-help rather than reception(Cornett & Urhan, 2021). In a broader sense, self-directed learning means that the teacher infuses self-directed knowledge into the student's learning process and encourages active knowledge acquisition. Students understand the importance of learning at all stages of life and achieve lifelong learning goals.

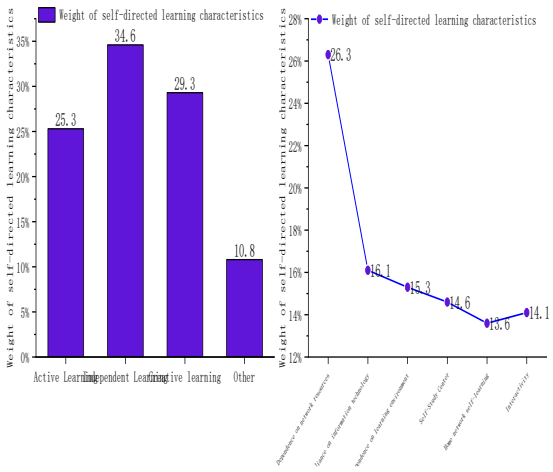

Figure 3 Attitudes and Types of Independent Learning Research Weights

As shown in Figure 3, this paper examines the weight of independent learning attitudes and types of research from the perspective of emphasizing student subjectivity, where initiative is expressed in terms of active willingness to learn, readiness to address learning challenges actively, and readiness to design lessons based on the content of the preparation stage. In contrast to the passive "author must learn" model, students in this model are not involved and usually receive intellectual indoctrination that strictly follows the school curriculum. Thus, independent learning is based on the student's intrinsic motivation to learn, with full activation of subjective initiative and active participation in learning. Another critical element of independent learning is the emphasis on independence. In recent years, with the 2019 coronavirus, education has created a new model of interactive online education. Undoubtedly, this environment's impact is that students learn independently and need their own living space to take online courses with their teachers. Students should enhance their autonomy and actively participate in learning, which is the basis of the SPOC learning

approach.

Students must log in, log out, do assignments, create videos, upload photos, Etc. If students' self-learning needs are underestimated or ignored in the learning process, they may gradually lose their autonomy. Students are used to following uniform teacher rules, depending on the classroom atmosphere and students' comments and concerns on the Internet. They can refuse to ask questions and express their personalities and opinions. This is a traditional way of learning that must eliminate the natural limitations of students. Another essential feature of self-directed learning is the creative process, i.e., the students' creative approach to learning and innovative learning methods. Because of the high demands of self-directed learning, it is not easy to provide an independent learning environment for each student in the class. The lack of innovation has become a pressing issue in educational reform due to differences in learning environments, other tasks and educational levels. The objection that "teachers are afraid to let go and students are afraid to let go" is becoming increasingly evident in the classroom. Therefore, the current situation will help overcome the obstacles. In online teaching, teachers take full advantage of students' initiative to learn independently, creating a calm and relaxed learning atmosphere and a relatively free platform. The development of aesthetic education is also an essential form of innovation that enhances students' creativity, diverse thinking and good communication skills, encourages teachers and students to learn different skills and improves their overall quality.

Table 2 Special advantages of teaching music in the SPOC model

	Common types of music instruction	SPOC model of music teaching
Method	Teaching method	mutual learning
pattern	Offline mode	Online + offline mode
Time	Within 50 minutes	There is no time limit; schedule anytime; master it.
resources	Textbook is the only learning resource	Multiple learning resources

4.3 Design Principles

Constructivist learning theory emphasizes the principles of student-centered learning, which requires that students are always at the forefront of curriculum design and that they are always the central goal of learning activities. In designing a SPOC high school music course based on constructivist learning theory, the authors needed to identify the essential place of students, respond to their needs based on learning, and implement individual and independent learning. However, this does not mean that the SPOC learning model diminishes or ignores the teacher's critical role. Teachers continue to play a leading role in all educational activities. Teachers continue to be replicators of knowledge, initiators of planned educational activities, evaluators of educational resources, guides and managers of students' educational activities, and catalysts for encouraging student learning. Teachers should develop professional responsibilities and roles that utilize students' cognitive experiences and thinking to perceive and learn the material and help students enhance and demonstrate subjective motivation. Therefore, students and pupils must follow the SPOC model when designing high school music courses. In teaching projects, the authors want to use technology fully, measure it, fully motivate students' psychological awareness, behaviors and attitudes, stimulate their sense of independence in music learning, and expand their mental abilities. Authentic student subjectivity, scientific freedom and autonomy are realized. The principle of practice is a student-centered teaching practice. Music education is art education. Various interesting music training courses can awaken students' consciousness, help them actively understand and experience the elements of music, and stimulate their enthusiasm for music learning. Therefore, when designing a high school SPOC music curriculum, attention should be paid to combining theory and practice. Create a free, relaxed, enjoyable atmosphere for students to practice music according to local conditions. When planning music learning, develop fundamental musical skills and communicate, talk and understand more with students according to specific standards. The goals of music education should align with students' knowledge and interests: it is best to consider each student's individual needs and increase students' awareness and creativity in participating in musical activities and achieving good results in music education. SPOC-based music learning programs include different forms of learning, such as online learning and online and offline blended learning. The music education system includes two aspects: music teaching and learning regularity. Preschool, classroom, after-school, online and offline programs are independent and interrelated in the learning process. To avoid differences between these teachers, the authors constantly look for connections between individual teachers throughout the learning process. Second, the music materials were systematized. Effective implementation of SPOC in school music programs requires a wide range of learning resources. When designing music learning activities, teachers need to combine and integrate different music learning resources to effectively broaden students' engagement in music learning and better manage learning tasks.

4.4 Analysis of empirical results

In the first question, "The author likes music lessons more than ever," more than half of the students chose "perfect," most included SPOC in music education to encourage and enhance students' interest in learning music. The second

question: "Top-notch online learning inspires music learning." 51.58% of students chose "perfect," 36.84% chose "relatively good," and only 1.05% chose "good." Only 1.05% chose "highly inconsistent," indicating that online self-help before class allows students to engage in music learning and take the initiative entirely. The third question: "In music classes, authors are more intuitive in feeling and understanding music's emotional and spiritual meaning (Faye et al., 2021). SPOC's online and offline music learning methods enable students to effectively engage with the world of music and develop their ability to feel and appreciate music." 49.47% of students thought this was very appropriate. Only 14.74% said that SPOC's online and offline music learning methods meet the music learning needs of students at different levels and effectively promote individual self-study of each student(Liu et al., 2022). The fifth question: "In everyday life, authors can choose their favorite music based on their aesthetics, analyze it correctly and communicate it to others." Most students chose the "perfect approach" and explained the use of the SPOC learning model in high school music classes. It helps students to create ways to appreciate music in their daily lives and to improve their methods and abilities to appreciate music in their communication and interaction with others.

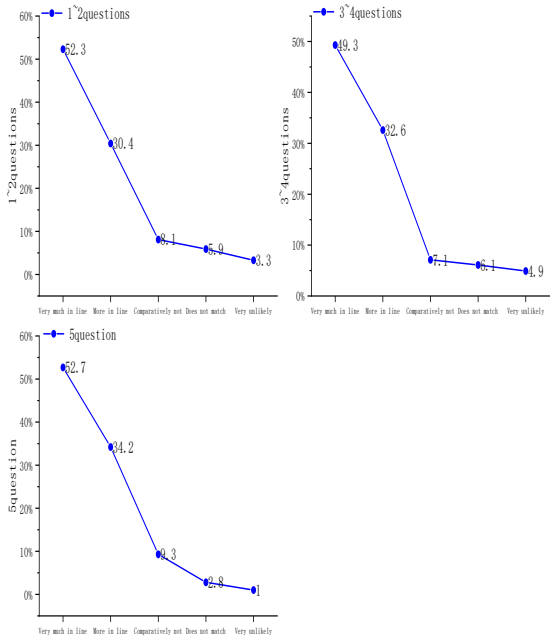

Figure 4 Consideration of value orientation and psychological factors

Figure 4 examines the value orientation and psychological factors, and the SPOC music teaching model performs well in the area of "emotional attitudes and values," indicating that the SPOC program helps to educate and develop students' musical awareness and positive internal experiences.

83.16% of the students actively watched music before class. By applying this model, students can create intrinsic motivation for music learning, actively participate, and play an essential role in forming and developing their awareness and autonomy(Font-Julián et al., 2022). More than half of the students chose "very healthy" for question 7: "The Author actively seeks help from teachers and classmates when learning music before class. With the interactive platform provided by computer technology, the SPOC helps students interact with their teachers and peers, learn about each other's problems and interests, and, for most students, improve their independent learning and leadership skills. In the eighth question, "Authors actively participate in music practice and music lessons," 45.26% of students chose "very consistent," and 36.84% chose "relatively consistent. "Only 3.16% of the students chose "very inconsistent"(Hoogland, 2021). In the ninth question, most students learn music knowledge and skills in music class, practice, and actively participate in music learning outside of school.

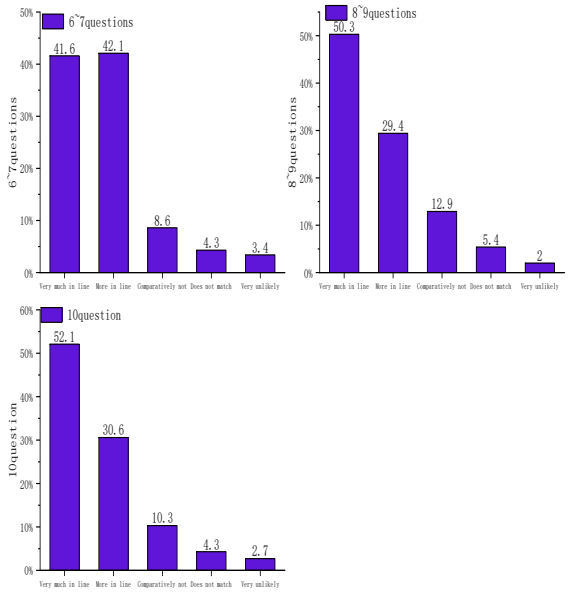

Figure 5 Analysis of methodological factors in the research process

From the analysis of methodological factors in the research process in Figure 5, it is said that the introduction of the SPOC music teaching model in secondary music education can significantly increase students' motivation to learn music, participate in class, play and communicate together(Hitt et al., 2022). Overall, combining online and offline music learning experiences is good, which can increase motivation and is very useful in music learning. More than half of the students thought the SPOC music learning space experience was excellent and could increase motivation to learn music.

5. Conclusion

This study aimed to develop students' ability to learn music independently in the SPOC model and to compare and analyze the SPOC model from different perspectives. It also emphasized the need to integrate information technology with high school music education closely. Also, based on the diversity of music aesthetics education, the SPOC learning process was developed by developing an independent learning approach to help students learn music independently, effectively developing the design phase of the learning process, and implementing the construction of independent knowledge. Future research could continue to develop in the reverse direction of empirical evidence and extensive data experiments.

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