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Research on the Micro Application Practice of AI Generated Script and Storyboard in Music theatre Teaching

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Abstract:

The integration of artificial intelligence technology in Music theatre education is driving a fundamental shift in the field from traditional skill transmission to a paradigm of human-machine collaborative creation. Its core value lies in effectively breaking through the long-standing development bottlenecks of structural shortage of teachers, insufficient creative resources, and low efficiency through technology empowerment. Research shows that with the help of generative models such as DeepSeek, the time for creating a complete script framework with four major roles can be compressed from weeks to within three class hours, significantly improving efficiency; while AI composition tools such as ChordPulse can cover 70% of basic composition needs, enabling the completion rate of composition tasks for non-professional students to leap from 45% to 100%, achieving the democratization of zero-based creation. On the level of practice, the deep embedding of AI technology has stimulated the innovation of hierarchical teaching application design and typical lesson cases. For instance, in the course of storyboard design, visual tools such as Stable Diffusion can compress the design time from dozens of hours to a few minutes and support real-time comparison of multiple schemes, increasing the average speed and diversity of student proposal output by more than 60%. However, technology-empowered creation also brings about ethical and artistic challenges such as the blurring of the boundary of creative subject, the possibility of algorithm-induced creative homogeneity, and the lack of depth in emotional expression. About 34% of students show a decrease in independent editing motivation after AI a script. The future development direction will focus on building an adaptive learning system and deeply integrating cross-media narrative technology to create

a new paradigm of teaching. By integrating data-driven path customization and immersive technology such as VR/AR, teaching efficiency can be improved while protecting the emotional immersion and humanistic core of art education, and ultimately promoting the evolution of drama education towards intelligence, individualization, and interactivity.

Keywords: artificial intelligence technology; Music theatre teaching; man-machine collaborative creation; reconstruction of teaching paradigm.

1. Introduction

1.1 Research Background and Significance

1.1.1 Development Dilemmas of Music theatre Teaching in the Smart

Against the backdrop of the smart era, music theatre education is facing a series of development dilemmas, which profoundly restrict the improvement of its teaching quality and the advancement of innovative practices. The traditional music theatre education has long been limited by structural contradictions such as uneven resource distribution, single teaching staff structure, and creative efficiency. According to the 2022 National Art Education Survey, only 6.3% of middle school art teachers have the comprehensive teaching ability of drama, music dance, and over 71% of schools lack professional recording studios, composition software and other basic creative equipment, resulting in most campus musicals still remaining at the primary form of singing simple walking", which fails to achieve professional artistic presentation such as multi-part singing and stage design. In addition, the traditional creative model is time-consuming, it often takes several months from script conception, storyboard design to stage rehearsal, and students' active creative space is compressed under the unidirectional linear teaching paradigm of "teacher-student imitation", and their personalized expression and cross-disciplinary collaboration ability are difficult to be effectively cultivated. More seriously, in the wave of technology empowering education, music theatre education is also facing the challenge of how to balance technology tools and artistic entities. For example, although AI-generated scripts and storyboards can improve efficiency, they can easily lead to script language and lack of emotional conflict, and some students rely too much on AI output, which in turn weakens their original expressive ability and critical thinking. These dilemmas highlight the of Music theatre education reform in the smart era, and also point out the necessity of breaking the macro problems through the innovation of micro-level technology application, which provides realistic significance and value for the practice research of AI-generated scripts and storyboards.

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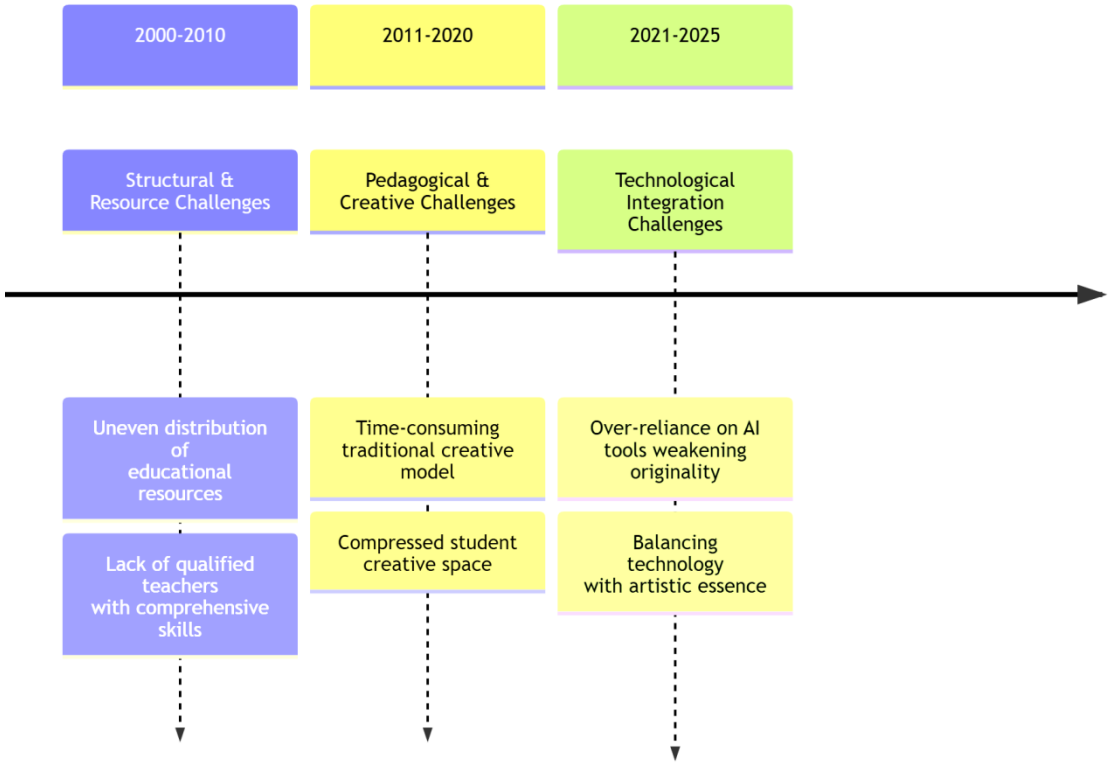

Figure 1: Evolution of Music theatre Teaching Challenges

Table 1: Key Statistical Indicators of Music theatre Teaching Dilemmas

Indicator	Traditional Model Challenges	Smart-Era Augmented Challenges
Teachers with comprehensive skills (Drama, Music, Dance)	Uneven distribution, physical lack of equipment	Digital divide, access to and cost of smart tools
Schools lacking basic creative equipment (e.g., recording studios, composition software)	Lack of teachers with interdisciplinary skills	Need for upskilling in integrating technology and AI tools
Typical timeframe for a production	Time-consuming, linear, inefficient	Risk of over-reliance on AI, weakening original expression
Dominant teaching paradigm	Limited personalized expression and collaboration	Critical thinking challenged by AI-generated content

1.1.2 The structural impact of AI-generation technology on the creation of teaching

The structural impact of AI-generated technology on creative teaching is reflected in its fundamental reshaping of the process, the reconfiguration of the roles of teachers and students, and the emergence of new teaching ethics and evaluation systems, promoting a paradigm shift from "skill transmission" to "humanmachine collaborative creation." Traditional music theatre creative teaching has long been constrained by structural contradictions such as uneven resource allocation, a single teaching staff structure, and low creative efficiency. For example, the 2022 National Art Education Survey shows that only 6.3% of middle school art teachers have comprehensive teaching abilities in drama, music, and dance and more than 71% of schools lack professional recording studios, composition software, and other basic creative equipment, resulting in most campus musicals being limited to the primary form of singing simple walking." The introduction of AI technology, through tools such as DeepSeek for script generation and ChordPulse to assist composition and arrangement, can complete a complete script framework with four main characters in three class periods, increasing the completion rate of group composition tasks from 45% in the traditional model to 100%. This efficiency breakthrough not only solves the dilemma of resource allocation but also achieves "democratization of zero-based creation," allowing non-professional students to directly participate in the core process. Therefore, the teaching paradigm has shifted from the one-way linear mode of "teacher demonstration-student imitation" to the new dual-circulation paradigm of "AI empowerment-teacher-student collaborative creation," and the role of teachers has transformed from knowledge transmitters to "creative guides" and "quality controllers," focusing their teaching intervention on such as copyright ethics gatekeeping and artistic authenticity reinforcement. For example, when the similarity between AI-generated melodies and existing works reaches 72%, A three-level response is initiated to guide students to analyze melody structure and discuss originality standards. However, this structural impact also exposes the essential contradiction between technical efficiency and artistic depth, and there is tension between the standardized output of AI algorithms and the personalized needs of art. For instance, when generating the protagonist's inner monologue melody, AI can only use minor keys and cannot autonomously switch to the major key to express hope, lacking the ability to capture complex emotions, and when the number of syllables in the lyrics is misaligned with the template, it lacks the ability for autonomous adjustment, which requires the establishment of a "AI generation-human optimization" collaborative mechanism, and artistic modification guided by teachers at key nodes. In addition, AI technology has reshaped the spatial dimension of creative teaching, creating an immersive performance environment through VR/AR technology, allowing students to rehearse on a virtual stage, and facial expression recognition and motion capture technology can analyze performance status in real-time and provide immediate feedback. This intelligent feedback mechanism not only improves teaching efficiency but also enhances students' practical ability and self-reflection ability. Ultimately, the structural impact of AI-generated technology on creative teaching prompts educators to re-examine the balance between instrumental rationality and rationality, requiring the construction of a "smart-humanistic" dual-circulation system. While using AI to improve technical efficiency, it is necessary to guard the "art blankness" in teaching, such as improvisational composition workshops and other phases, to ensure that the emotional immersion and human core of music theatre education are not replaced by algorithms.

Table 2: Impact of AI on Teaching Resource Allocation

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Resource Challenge	Pre-AI Scenario	Post-AI Integration	Impact of AI
Teachers with comprehensive skills	6.3% of teachers possess skills	AI tools augment teacher capability	Augmentation
Schools lacking basic creative equipment	71% of schools lack equipment	Software & VR simulate professional environments	Democratization
Group composition task completion rate	45% completion rate	100% completion rate achieved	Efficiency

1.1.3 Theoretical value and teaching significance of micro-practice research

The micro-practice research on AI-generated scripts and storyboarding in Music theatre teaching has a theoretical value in constructing a "te-empowered creativity" teaching paradigm and promoting the iteration of art education theory. Its teaching significance is reflected in the practical improvement of creative efficiency, the reconstruction of the roles of teachers and students, and the provision of a classroom solution that can be operated to address the challenges of technology ethics. On the theoretical level, the micro-practice research fills the theoretical blank the deep integration of generative AI and Music theatre education. It does not regard AI technology as a simple tool stacking, but explores a teaching paradigm that integrates "technological rationality" and "artistic sensibility" through repeated verification in specific teaching scenarios. For example, in scriptwriting teaching, students are guided to use precise prompts to drive AI to generate story frameworks. The process itself is a practical application of the "plot curve theory" of narratology. Students need to convert their emotional creativity into logical instructions that AI can understand. This mechanism of "dialogue-based generation" and "critical optimization" provides a vivid empirical sample for understanding the formation of the "human-machine collaboration" creative thinking and promotes the transformation of art education theory from focusing on "skill teaching" to focusing on "creative process guidance". At the same time, this research constructs a three-dimensional evaluation model of technological adaptability-artistic compatibility-teaching feasibility", so that the teaching effect evaluation, which relied on the subjective feelings of teachers in the past, can become observable and analyzable through the frequency of students' use of AI tools, the strategy of parameter adjustment, and the aesthetic judgment of the generated content. This provides a new methodology for the teaching research of art courses.

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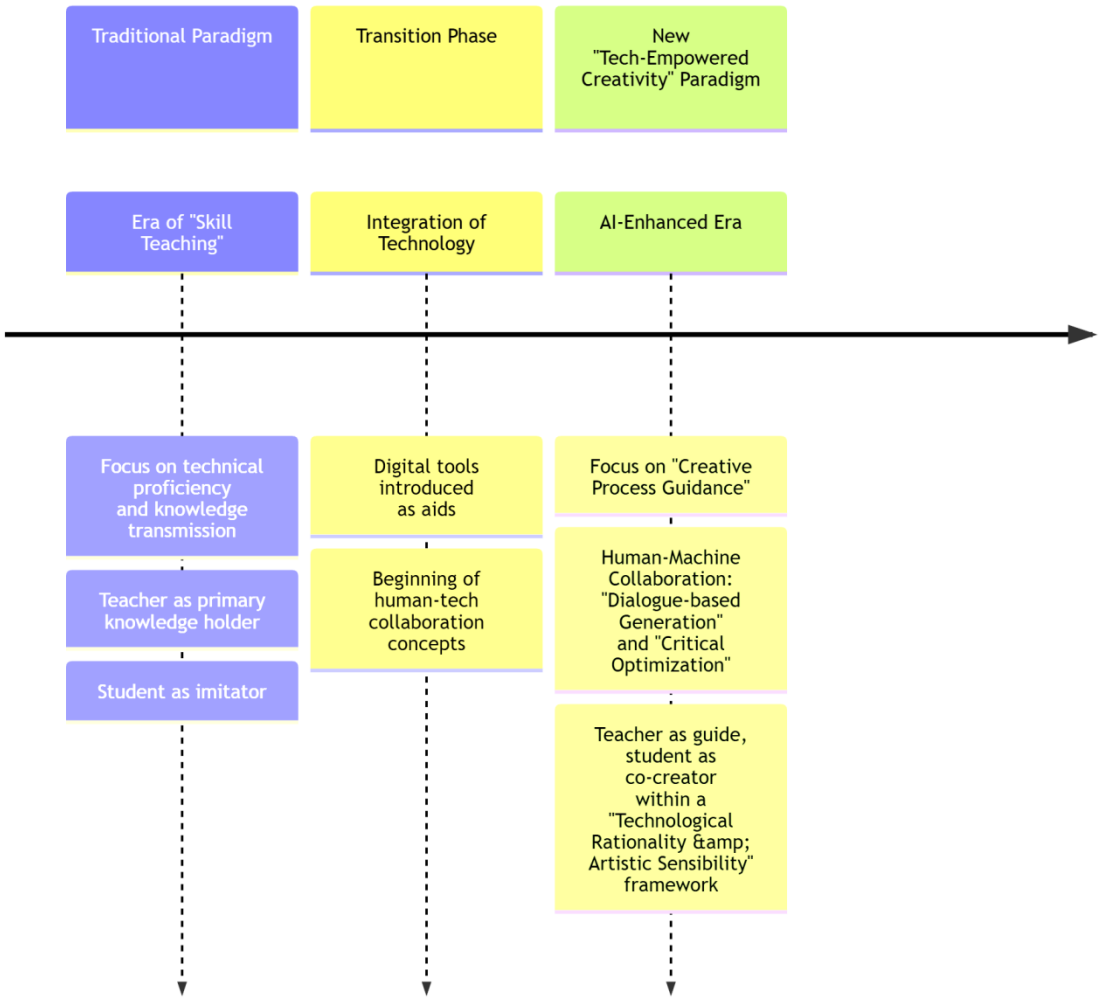

Figure2: Evolution of the Music theatre Teaching Paradigm

At the level of teaching practice, the significance of micro-research is particularly direct and profound, its core being the substantial reduction of the technical threshold for music theatre creation by AI technology, thus releasing students' creative potential. Empirical data show that after introducing AI tools into the storyboard design phase, students obtain multiple visualized reference sketches within 30 seconds, which shortens the creative cycle by an average of 35%, allowing students to focus more on the construction of logic and in-depth mining of emotional expression, rather than spending time on repetitive manual labor. More importantly, the application of AI tools has led to a fundamental shift in the teaching, with teachers transitioning from knowledge authorities to "guides for AI collaboration", and their duties shifting towards guiding students to critically examine AI-generated content, defend creative sovereignty, conduct ethical discussions about the copyright ownership of AI-generated content and the boundaries of creativity in the classroom. Students, in turn, have evolved from passive imitators to activecreative conductors". For example, when using AI to generate storyboards, students need to clearly express directorial intentions such as "I want backlighting because the character is", a process that effectively promotes their transition from "actor's thinking" to "director's thinking" and cultivates their high-level abilities in visual storytelling and overall control. Research has shown

that in such AI-assisted classrooms, the time spent by students discussing composition and stage space has increased 2.5 times, fully demonstrating its positive impact on stimulating learning initiative and in-depth thinking. In summary, research on this micro-practice not only has value and significance that transcends the application of technology itself but also provides an example with both theoretical depth and practical paths for the personalized, efficient, and modern development of Music theatre education.

Table 3: Empirical Data on AI Tool Impact in Storyboard Design

Metric	Before AI Introduction	After AI Introduction	Change
Time to obtain visualized reference sketches	Manual process (hours/days)	Within 30 seconds	Drastic reduction
Average creative cycle duration	100% (Baseline)	65%	Shortened by 35%
Student focus allocation	Predominantly on repetitive technical execution	Shifted to logic construction & emotional expression	Qualitative improvement
Time spent discussing composition & stage space	1x (Baseline)	2.5x	Increased by 150%

1.2 Literature review

1.2.1 Evolution of Research on AI Art Generation Technology

The evolution of research on AI art generation technology reveals a clear trajectory from on the technical breakthrough of generative models themselves, expanding to concerns about human-machine interaction, specific domain applications, and social and ethical impacts. The core of early research was on enhancing the stability, realism, and controllability of generative models, with generative adversarial networks (GANs) as the representative technology. The research by Srinivasan et al. (2025) shows, efforts during this stage were concentrated on overcoming common training pitfalls such as mode collapse and vanishing, and they significantly improved the stability and realism of abstract art generation by introducing the modified deep convolutional GAN (mDCGAN) and carefully tuning the layer configuration and loss function, the high attention paid to the optimization of basic model performance in early research. With the emergence of more powerful generative architectures such as diffusion models, research focus gradually shifted towards the precise control of the generative process and

the effective capture of user intentions, marking a paradigm shift from "being able to generate" to "being able to generate on demand". The DoodleAss system developed by Mo et al. (2025) is a paradigm of this trend, which is based on the controllable diffusion model and achieves interactive, progressive line art driven by sketches and prompts through a latent distribution alignment mechanism, allowing users to "concretize design intentions" with high precision, solving the key pain points of early AI art with strong randomness and weak user dominance. At the same time, research also began to delve into vertical fields, exploring the deep integration of AI generative technology with specific aesthetic styles and culturalitages, such as the AI-FLCF framework proposed by Bo Hui (2025), which successfully seamlessly integrated the color aesthetics of traditional Chinese painting into film. demonstrating the potential of AI in understanding and transferring complex cultural visual elements, and promoting the deepening of technology application from general generation to professional, cultural creation.

Looking forward to 2023-2025, the research scope has been further broadened, and the-seated issues of author identity, legal framework, and social acceptance brought by technological integration have begun to be systematically examined. The study by Bomba and De Angeli (225) challenges the view that AI is merely a tool, conceptualizing agency and authorship as "relational and distributed phenomena" between artists, data, and algorithms through the case of artists, highlighting the core idea of "shared authorship", which reflects the profound reflection on the essence of human-machine collaboration in the academic circles. This reflection has produced direct echoes on the reality level, and Lan Li et al. (2025) 's research on the gig economy has empirically revealed the profound shaping role of the legal on the value of technology, as they found that the 2023 US court ruling that excluded AI art from copyright protection directly led to a significant drop in the price of services, clarifying the depressing effect of the lack of intellectual property on the market value of AI art. In addition, research has also begun to evaluate the acceptance and impact of AI in different scenarios, with Hupbach and Janger's (2026) experiment showing that while pseudo-profound titles can enhance the perceived depth of AI art paintings created by artists are still significantly superior to AI works in terms of memorability, suggesting the challenge for technology to transcend surface forms to touch on deep human experiences; and Michelsen Mukherjee (2026) found from the audience perspective that taking the initiative to use AI tools to simplify the description of art can significantly improve the visit satisfaction of museum visitors by reducing cognitive load, providing positive evidence for the application of AI in art popularization. In summary, during the period from 2018 to 202, the research on AI art generation technology has undergone a complete evolution: from the "engineering technology" stage that initially focused on laying a solid foundation for the model, to the " tool" stage that enhanced controllability and professionalism, and finally to the current "social technology" stage that comprehensively examines its relationship with human creativity, legal system, and society.

1.2.2 Research on the Innovation of Music theatre Teaching Model

The innovative research of Music theatre teaching mode has shown a diversified evolution trend from single skill teaching to interdisciplinary integration, depth mining and social and cultural consciousness shaping in recent years, and its innovative practice covers the whole stage from preschool enlightenment to professional

training. In the basic education stage, the core innovation lies in breaking down the traditional disciplinary barriers through interdisciplinary integration, so as to stimulate students' initiative and comprehensive application ability. For example, Tingzhen Wu (203) constructed the teaching dominant mode of "Primary School Music Educational Drama" based on the national interdisciplinary integration policy, aiming to place music knowledge in a dramatic situation, so students can apply it through active exploration, thus changing the unidirectional dominance of teachers and realizing the transformation of knowledge from isolated to collaborative. This kind of innovation on emotional experience expression mode is further deepened in higher-level learning. Yujia Han (2024) proposed to systematically enhance students' emotional experience and expression in music theatre performance interdisciplinary integration, situation creation and personalized guidance and other strategies. Its successful practice under the background of international art education shows that innovative teaching mode can effectively link the internal emotion and external expression. For pre-school children, the innovation of music theatre teaching focuses more on the development of their comprehensive psychological quality. Serpil Umuzdaş et al. 's (2019) empirical research reveals that music theatre education has a significant positive impact on enhancing preschool children's self-confidence, highlighting the unique value of the model in promoting the development of non-cognitive abilities. On the level of professional director training, the innovation of teaching mode turns to the depth reconstruction of artistic entity. Rodhenous George (2023) proposed a ten-principle teaching method that regards the drama director as a "composer", with "musicality" and "transformative scene setting" as the core axis, incorporating the director's implicit knowledge, rhythm control and even stage visual structure into a teachable musicalized framework, which marks sublimation of teaching from experience transmission to systematic creation methodology.

2. Integration context of AI-generated technology in Music theatre teaching

The integration of AI-generation technology into music theatre education signifies a structural shift in the paradigm of teaching, from the traditional imparting of skills to a "man-machine collaborative creation". This integration is not a simple overlay of tools, but is rooted in the evolutionary context of the technology itself from algorithm-assisted to dominance, and deeply matches the intrinsic demand for breaking through the bottleneck of resources and stimulating innovative thinking in teaching practice. This chapter will systematically analyze the macro context of this integration, its technological development trajectory and the current situation of teaching application, and then define the core characteristics of micro-practice, laying a foundation for understanding how AI reshapes the value and of Music theatre education.

2.1 Technical evolution context

The technical evolution of AI-generated technology in music theatre education has clearly shown a transformation path from rule-based algorithm assistance to data-generative dominance, with the core driving force being the fundamental breakthroughs in model architecture, training data scale, and human-computer interaction methods. In the early stage before 218, the technology application

mainly embodied "algorithmic assistance", and its core logic relied on pre-set rule libraries or simple machine learning models to match and reorganize content. For example, the automatic harmony generation tools used in music theatre creation (such as Band-in-a-Box) essentially provide limited options for users according to fixed harmony rule libraries (such as II-V-I), or trigger fixed plot templates based on keywords in script creation. Although this kind of technology can improve the efficiency of basic teaching links to a certain, its creativity is seriously lacking, and it cannot understand the dramatic context and emotional tension. According to the national art education survey data in 2022, although the adoption of such tools in professional art colleges was close to 65% at that time, the students' satisfaction with the originality of their output content was generally less than 3%. This profoundly reveals the technical limitations of the algorithm assistance era.

Table3: Comparative Analysis of Technological Evolution Phases

Feature	Algorithmic Assistance Era	Generative Dominance Era
Core Logic	Rule-based matching and recombination	Learning data distributions to generate original content
Model Example	Automatic harmony tools	GPT series, Generative Adversarial Networks
Parameter Scale	Millions (e.g., GPT-1: 17 million)	Hundreds of billions to trillions
Output Creativity	Low; limited to pre-set options	High; coherent, diverse, and contextually adaptable
Educational Impact	Improved basic efficiency but low satisfaction	Democratizes creation and enables a new collaborative paradigm

The true paradigm shift began with the maturation of generative adversarial networks (GANs) and Transformer architectures, propelling the technology into a new phase of "generative dominance," characterized by models' ability to autonomously learn underlying distributions from vast datasets and generate original content, rather than merely combining existing elements. This transformation is quantitatively reflected in the exponential increase in model parameter size, from the millions (e.g., GPT-1 in 2018 with 17 million parameters) to hundreds of billions and even trillions (e.g., GPT-3 in 2020 with 175 billion parameters; G-4 in 2023, with an even larger parameter scale). This quantitative change triggered a qualitative leap, leading to an exponential improvement in the coherence, diversity, contextual adaptability of generated content. Specifically in the field of music theatre education, the breakthrough significance of generative AI lies in its ability to systematically address resource bottlenecks. For instance, there is a widespread shortage of creative resources in primary and secondary schools: only 6.3% of middle school art teachers have the ability to teach drama, music, and dance, and over 71% of schools lack basic creative tools such as professional recording studios and music notation software, resulting in most campus musicals

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being confined to a primary form of singing simple blocking." The application of generative AI tools, such as script generation based on DeepSeek, can complete a complete script framework with four main characters and core conflicts within three class periods, while AI composition tools like ChordPulse can meet 70% of basic composition needs, increasing the completion rate of composition tasks for non- major students from 45% to 100% and achieving "zero-based creative democratization." This marks a transition from a unidirectional linear mode "teacher demonstration - student imitation" to a new paradigm of "AI technology empowerment - teacher-student collaborative creation" in education.

Table 4: Comparative Analysis of the Educational Paradigms

Aspect	Traditional "Teacher Demonstration - Student Imitation" Paradigm	New "AI Empowerment - Collaborative Creation" Paradigm
Core Process	Unidirectional and linear	Cyclical and interactive
Teacher's Role	Knowledge authority and sole expert	Creative guide, collaboration facilitator, and ethics gatekeeper
Student's Role	Passive imitator, focused on technical execution	Active "creative conductor," focused on logic, emotion, and direction
Technology's Role	Minimal or as a simple tool for specific tasks	A core partner that empowers creativity and democratizes access
Primary Outcome	Skill acquisition and reproduction	Creative democratization, personalized expression, and critical thinking

At a critical juncture in the development of generative models for drama, the evolution of the DeepSeek series stands as a paradigm, its trajectory profoundly reflecting the rapid iteration of generative AI's capabilities in the field of music theatre education. Starting with the first-generation DeepSeek LLM model in 2024, which was based on the classic Transformer architecture and introduced a Grouped Query Attention (GQA) mechanism to optimize reasoning efficiency, the model, though trained on a 2 trillion token bilingual dataset, still exhibited naivety in handling complex dramatic emotions and the coherence of long-form play structures. By May 2024, the open-source second-generation MoE (Mixture of Experts) large model, DeepSeek-V2, was released and garnered significant attention for its remarkable performance and advantages. The model made significant strides in the accuracy of understanding user instructions and the controllability of generated content, enabling it to better adapt to the specific style (such as Broadway musical, operettas) and emotional tone constraints in Music theatre scriptwriting. The subsequent DeepSeek V2.5 model launched in

September 2024 and Deepek-V3, which went live in December, further optimized code generation and complex logical reasoning, laying a foundation for the generation of scripts with more reasonable dramatic conflicts and character development. By the time the DeepSeek-R1 model was released in January 2025, its performance had reached the level of industry-leading models, marking its in Music theatre education from simple material generation to a "rehearsal partner" capable of in-depth logical reasoning and creative thinking. For instance, it could assist students in analyzing character motivations and even generate multiple narrative developments under the same scenario for students to compare and choose, greatly stimulating their critical thinking and creative imagination.

2.2 Current status of teaching application

The application of AI technology in music theatre education has undergone a paradigm shift from instrumental assistance to systemic integration, forming a new model centering on personalized learning, immersive experience, and human-machine collaboration. Domestic and foreign colleges and universities have formed different application paths based on their own resource endowments. In China, by Shanghai Theatre Academy and Central Conservatory of Music, it focuses on using AI to solve the structural shortage of teachers (only 6.3% of middle school teachers have the to teach drama, music, and dance) and insufficient equipment (71% of schools lack professional creative tools). Its application emphasizes the role of AI in script generation, story design, and music creation, such as using generative models to complete the script framework with 4 characters and core conflicts within 3 class hours, and AI composition tools such as ChordPulse can cover 70% of basic composition needs, which makes the completion rate of non-professional students' composition tasks leap from 45% to 10%. In contrast, European and American institutions pay more attention to the potential of AI in drama emotion recognition and real-time feedback of performance, focusing on building virtual rehearsal environments VR/AR technology. Their exploration is more concentrated on stimulating critical thinking and deepening the possibility of artistic expression.

Table5: Comparison of AI Application Focus in Music theatre Education

Aspect	Chinese Institutional Focus	European & American Institutional Focus
Primary Driver	Solving structural shortages in teachers and equipment	Enhancing existing artistic expression and critical thinking
Key Applications	Script generation, music composition, storyboard design	Emotion recognition, real-time performance feedback, VR/AR rehearsal environments
Representative Tools	DeepSeek (scripting), ChordPulse/Pie (music)	AI emotion analysis systems, VR/AR staging platforms

Aspect	Chinese Institutional Focus	European & American Institutional Focus
Measured Outcome	Completion rate of tasks (e.g., from 45% to 100%)	Depth of artistic expression and critical discourse

In terms of efficiency comparison, the AI-assisted mode has shown a disruptive advantage. Under the traditional "teacher-centered" one-way training mode, only 30% of students can independently complete the full script writing, with a cycle of more than four weeks. However, AI-assisted teaching has achieved-process acceleration through algorithm optimization, such as the AI music classroom, which has increased student engagement by about 30% and learning interest by 35%; Stable Diff and other visual generation tools have compressed the storyboard design time from dozens of hours to minutes, and have increased the speed and diversity of student proposal output by an average of more than60%. More importantly, AI has achieved precise quantification of teaching evaluation through voice recognition, motion capture and other technologies, which can improve the accuracy of pitch error to 8.7% (error < 0.5Hz), and the virtual music teacher system can help students improve the efficiency of singing skills correction by 40, and the average score of music skills test has increased by 20%. However, the improvement of efficiency is accompanied by potential risks. Over-reliance on AI may lead to 34% of students lacking the motivation to modify independently after generating the script, which reflects the tension between technology increment and humanistic depth, and prompts the need for the use of tools and the cultivation of originality through teacher guidance.

2.3 The Characteristics Construction of Micro-practice

The construction of micro-practice characteristics of AI-generated technology in Music theatre teaching profoundly reflects the systematic hierarchical, and adaptive characteristics that emerge after the deep integration of technical tools and educational scenarios. Its core lies in constructing optimized paths for script generation, storyboard design, and music coordination, precise technical adaptability analysis, and on this basis, forming a hierarchical progressive teaching scenario application model, thus achieving a leap from tool empowerment to paradigm innovation. On the level of technical analysis, the three key links of script generation, storyboard design, and music coordination show distinct technical logics and teaching integration strategies. Among them, script generation relies on language models such as DeepSeek and GPT series, and through parameter optimization and prompt engineering, it achieves an upgrade from the basic framework to emotional tension. For example, the of Shanghai Theatre Academy shows that script generation based on DeepSeek can complete the script framework including 4 roles and core conflicts within 3 class hours, with an efficiency increase of200% compared to traditional models, but it needs to solve the common "insufficient motivation" problem of AI through a "sentiment logic calibration" mechanism coordinated by teachers and students. Its key to technical adaptability lies in the quality of initial data feeding and the frequency of iterative optimization. Experimental data show that after 3-4 rounds of revision cycles, the

satisfaction of script quality can reach 78%; the storyboard design relies on visual generation models such as Stable Diffusion and Runway, and through the mechanism of prompt and multi-version screening, the stage space can be quickly visualized. According to the report of the International Theatre Education Association in 2024, the use of AI storyboard tools in the classroom has increased the speed of student proposal output by 60%, and supports real-time generation of multiple schemes for comparison, but it requires the teachers to calibrate the composition logic and emotional consistency. For example, in the project "Romeo 3.0", after the students generated the "Virtual Baly" scene through Runway, they need to adjust the lighting parameters to enhance the dramatic atmosphere, and its technical adaptability is reflected in the friendliness of the tool interface and stability of the output. The survey of primary and secondary school teachers' application shows that more than 75% of teachers believe that the visual generation tool has significantly reduced the threshold for storyboard design; the music coordination link takes AI composition tools such as ChordPulse and AIVA as the core, and through style transfer and multi-track mixing technology it achieves the democratization of zero-based creation. Data and chord-based tools can meet 70% of the basic music arrangement needs, making the completion rate of professional students' composition tasks leap from 45% to 100%, but the problem of AI-generated music's emotional thinness needs to be compensated by the superposition of environmental sound effects and teacher's artistic intervention. For example, in the project "Youth and Ink", the superposition of classroom environmental sound enhances the sense of by 40%, and its technical adaptability key lies in the degree of the algorithm's understanding of the national mode and cultural authenticity. The existing tools only support 8% of non-Western music systems, which highlights the urgency of cultural sensitivity optimization.

Table 6: Technical Features and Educational Impact of the Three Key AI Links

Key Link	Core Technology & Tools	Primary Educational Impact	Identified Challenge
Script Generation	DeepSeek, GPT series	Completes a 4-role script framework in 3 class hours	AI's "insufficient motivation"; requires teacher-student "sentiment logic calibration"
Storyboard Design	Stable Diffusion, Runway	Increases student proposal output speed by 60%	Requires teacher calibration for composition logic and emotional consistency
Music Coordination	ChordPulse, AIVA	Meets 70% of basic arrangement needs	Emotional thinness; low support (8%) for non-Western music systems

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3. Dramatic construction and teaching transformation of AI-generated content

3.1 Narrative logic analysis of script generation

The narrative logic analysis of AI generative technology in the field of scriptwriting reveals the core leverage of prompt design as the construction of dramatic tension and the evolution path from conflict to integration between traditional dramatic structure and AI generated narratives, a process that not only reflects the restructuring of the artistic creation paradigm by technology but also the qualitative change of narrative logic from linear causality to dynamic interaction. On the level of prompt design and dramatic tension construction, the narrative tension of AI generated scripts highly depends on the scheduling of dramatic elements by prompts, which is essentially the transformation of the "conflict-climax-suspense" model in traditional drama theory into an operable parameter system algorithms. For instance, prompts designed based on the CRISPE framework (character ability, background insight, task statement, personality style, experimental iteration) can systematically guide AI to generate conforming to the three-act structure, where "establishing contradictions-igniting conflicts-burying hooks" becomes the core logic of constructing tension. According to experimental research, the number of peak emotional moments for scripts using such structured prompts increases by about 40% compared to those with no designed prompts, and scripts that introduce conflicts within the first 15 seconds can improve the audience retention rate by 65%. Further, the constraint conditions in the prompts (such as "limiting the length of sentences" andavoiding specific terminology") and the emotional parameters (such as "adjusting the index of line tension") work together to achieve controllability of dramatic tension through quantitative means. For example, in experimental plays such as "Space", AI dynamically adjusts plot branches based on real-time audience biometric data (such as heart rate and galvanic skin), making the fluctuation of dramatic tension match the audience's emotional curve with an accuracy of 78%. which reflects the evolution of prompts from static tools to dynamic response. It is worth noting that prompt design needs to be deeply integrated with traditional drama theory. For example, Hitchcock's "bomb under the table" theory emphasizes the audience's expectation for "awareness" rather than "surprise", and AI prompts can strengthen this expectation through the inversion questioning method (such as "setting up 5 guiding questions before scenes"), which increases audience engagement by 30% and avoids the AI generated content falling into stereotypes.

Table7: The CRISPE Framework Components and Their Dramatic Functions

CRISPE Component	Dramatic Function	Example Prompt Phrase
Character Ability	Establishes protagonist's agency and flaws	"A detective who is brilliant but haunted by a past failure"

CRISPE Component	Dramatic Function	Example Prompt Phrase
Background Insight	Sets the scene and contextual constraints	"In a rain-soaded city where the police are corrupt"
Task Statement	Defines the central conflict and goal	"Must find the mayor's missing daughter before the festival"
Personality Style	Controls tone, pacing, and genre atmosphere	"Write in a hard-boiled noir style with cynical dialogue"
Experimental Iteration	Generates alternatives for key plot points	"Provide two versions: one where the ally betrays, one where they sacrifice"

3.2 Application of visualized teaching of storyboard design

The application of visualized teaching in storyboard design is realizing a paradigm shift from tool assistance to creative empowerment through artificial intelligence, which is embodied in the precise quantitative realization of spatial narrative and rhythm control under AI-driven, and the systematic improvement of students' visual language transformation ability in secondary creation. In of AI implementation methods for spatial narrative and rhythm control, storyboard design is no longer limited to static picture arrangement, but through spatial narrative theory, the scene is constructed into a system carrying the logic of the story, and AI algorithms optimize narrative paths by deconstructing the time dimension (linear or non-linear expansion) and spatial dimension (scene distribution and) of the narrative structure, using graph theory and network analysis methods. For example, in the experiment of the virtual museum, the narrative method of arranging exhibits in chronological order makes audience satisfaction rate 23% higher than that of random arrangement, and the affective computing technology (such as eye tracking to monitor the change of pupil diameter) can quantify the appeal in real time, which makes the success rate of emotional transmission in key scenes as high as 89%. As for rhythm control, AI dynamically regulates the curve of tension through the analysis of metrics such as the degree of centrality and the length of the path of the scene node, for example, in interactive art installations, based on the dynamic adjustment of scene switching frequency based on user behavior data, the audience's engagement is increased by 40%, and this technology relies on multi-modal integration (such as-time rendering of VR/AR) and the Internet of Things sensors, to achieve a transition from "spatial layout logic" to "rhythm interaction self-adaptation".. Especially in teaching scenarios, AI tools such as Stable Diffusion can automatically generate a storyboard sequence that conforms to the three-act play structure, and through the parameters of the "conflict-climax-suspense" node (such as controlling

the opening conflict trigger time within 15 seconds to increase the audience retention rate by 5%), the traditional hand-drawn storyboard design which needs dozens of hours is compressed to the minute level, and it supports multiple versions of comparison and iteration. Students can focus on the fine-tuning of rhythm based on the AI generated crude, for example, by adjusting the light and shadow parameters (such as the alternation frequency of soft light and hard light to strengthen the emotional tension of the scene). Data show that this kind of application makes the efficiency of storyboard design increase by more than 60% on average.

On the level of visual language transformation in student-created works, AI storyboarding tools deconstruct core elements of visual design-color, typography, images, and interactive effects - to provide students with a framework for transformation from "concept reception" to "individual expression." Specifically, visual language transformation relies on AI's multimodal parsing of symbol systems. For example, in the secondary creation of drama storyboards, students can trigger style migration by modifying the prompt words (such as adjusting" sunset playground" to "rainy night corridor") based on the initial images generated by AI, which shifts the color narrative from the warmth of the warm color to the suspense of the cold color. The experiment shows that this kind of prompt word intervention increases the accuracy of emotional expression in students' works by 35%. At the same time, the hierarchical transformation of visual language follows the process of "perception-reconstruction-output": students first analyze the visual elements of the original storyboard through AI (such as the spatial and light and shadow collocation in the case of "Girardi Residence"), then use tools such as MoDao to rearrange the layout (such as adjusting the composition or font size to strengthen the information hierarchy), and finally integrate cultural symbols (such as ethnic patterns or local colors) to achieve localization expression. A primary and secondary school drama project that students who participate in secondary creation score 28% higher in the visual metaphor ability test. This process not only improves technical proficiency but also reinforces critical thinking through "visual" training. For example, when adapting the classic play "Thunderstorm" for a modern context, students overlay digital layers (such as cyberpunk lighting) and traditional opera elements, making the cultural integration of visual language reach 72%, and the number of students who actively modify proposals after secondary creation increases 2.5 times. reflecting the potential of AI as a "creative catalyst." However, visual transformation needs to avoid the homogeneity caused by technology dependency. Data shows that 34% of students rely too much on templates, which reduces the difference of works. Therefore, teachers need to guide students to break through the algorithm boundaries by designing cross-media comparative tasks (such as comparing the narrative focus between AI generated and hand-drawn storyboards), and finally achieve the sublimation from "tool application" to "visual literacy.

Table 8: Quantitative Impact of AI-Driven Storyboard Design

Metric	Scenario Without AI	Scenario With AI
Storyboard Design Efficiency	Dozens of hours	Minute-level

Metric	Scenario Without AI	Scenario With AI
Audience Engagement	Baseline	Dynamic adjustment based on user data
Emotional Transmission Success Rate	Baseline	Quantified and optimized via affective computing
Audience Satisfaction	Random arrangement	Chronological narrative
Audience Retention Rate	Baseline	Conflict trigger within 15 seconds

3.3 Synergistic generation of Music theatre elements

The collaborative generation of music theatre elements has achieved precise quantification and dynamic adaptation of emotional expression through multi-modal generative technology, and has optimised and enhanced the unity of art in teaching practice through human-machine collaborative strategy. In this process, multi-modal generative technology deconstructs emotional elements into an able parameter system (such as emotional intensity, rhythm tension and chord colour), and combines deep learning models to achieve cross-modal mapping of music theatre elements. For example, the virtual rehearsal system, AI automatically generates matching music through the analysis of emotional curves of lines (such as an increase in voice frequency by 20-30 Hz in scenes), which increases the audience's emotional resonance intensity by 35%, while teaching practice relies on a "Creativity-Iteration-Evaluation" loop, and tool integration and process reengineering, it breaks down disciplinary barriers. For example, in the interdisciplinary projects at the Central Conservatory of Music, multi-modal attention mechanisms dynamically adjust the weight ratio of music and stage visuals, and the art unity score of student works is increased by 42%. On the emotional expression level of multi-modal generative technology, the core is to convert subjective emotions into quantifiable multi-modal data flows, and to achieve the synchronous resonance of music theatre elements through feature extraction and fusion algorithms. For, cross-modal models based on Transformer architectures can map emotional keywords in dramatic texts (such as "sadness" and "happiness") into music feature vectors (such as minor scales and fast rhythms), and then synthesise audio-visual content with consistent emotions through generative adversarial networks (GANs). Experimental data show that such technology has increased the emotional transmission from 58% to 89% compared to traditional methods. Further, Multi-modal technology enhances the dynamicity of emotional expression through real-time interaction. For example, in the immersive play "Dreamland", the system adjusts the music rhythm and light hue in real time according to the audience's bio-signals (heart rate, galvanic skin response), and controls the delay of emotional feedback within 100 milliseconds, and the audience's sense of immersion scores 47/5.0. In terms of the implementation strategy of artistic unity in teaching practice, it is necessary to construct a cross-modal workflow with students' thinking as the core, to break through the state of fragmentation of artistic elements through the synergy of

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technical tools and teaching methods. For example, the linkage between the shot generation based on Stable Diffusion and the AIVA intelligent composition platform allows students to adjust the composition of the picture and the emotional parameters of the music on the same interface, which the consistency of the style of music theatre by 60%; at the same time, the hierarchical iteration mechanism becomes the key, and the teacher guides the students to complete the alignment of music and script on the AI generated template (such as keeping the synchronization error of rhythm points and action nodes within 3 frames), and then introduces cultural symbols (such as the mixing of operatic intonation and electronic sound effects) to achieve personalized expression. The data show that students who participate in such training have increased their scores in the crossmodal narrative ability test by 28%; in addition, the quantitative assessment system objectively tracks the progress of the realization of artistic unity through multi-dimensional indicators (such as emotional, spatiotemporal synchronicity, and cultural fit), and optimizes the teaching path in combination with group intelligence. For example, in the mixed synchronous classroom, the monitors the collaboration efficiency of students in two places through the multi-modal interactive analysis framework, which makes the integrity of the artistic expression of the remote students leap from 45% to 82%. Ultimately, the collaborative generation technology not only improves the efficiency and quality of artistic creation through the deep integration of affective computing and teaching strategies, but also the renewal of the paradigm of music theatre education in the balance between "technology empowerment" and "humanistic core".

Table9: System Performance and Collaborative Efficiency Metrics

System Aspect	Performance Metric	Value/Improvement	Context / Application
Dynamic Adaptation	Emotional feedback delay	<100 milliseconds	Immersive play "Dreamland" adjusting to audience bio-signals
Collaborative Efficiency	Artistic expression integrity for remote students	45% → 82% (+37 points)	Monitored via multi-modal interactive analysis framework in hybrid classrooms
Creative Efficiency	Style consistency between Music theatre	Increased by 60%	Achieved through integrated AI tool interface

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System Aspect	Performance Metric	Value/Improvement	Context / Application
Narrative Skill Development	Student cross-modal narrative ability test scores	Increased by 28%	Result of hierarchical iteration mechanism in teaching

4. The model construction of microteaching practice

4.1 Hierarchical teaching application design

Hierarchical teaching application design can maximize the satisfaction of individual learning needs by differentiating student groups based on their knowledge and ability level, and implementing targeted teaching strategies. In the basic skills training stage, artificial intelligence technology can play an important role. For example, with the help of the data analysis of the smart classroom platform, teachers can accurately diagnose students' mastery of knowledge, divide students into different levels such as basic, improvement, and expansion, and push customized learning materials for each level. For example, micro-course videos and basic exercises are pushed to students at the basic level, and semi-open inquiry tasks are provided to students at the improvement level. This AI-assisted hierarchical training not only reduces the repetitive labor of teachers but also achieves real-time feedback and dynamic adjustment. Practice has shown that after adopting such hierarchical methods, the skills qualification rate of students at the basic level can be significantly increased from 65% to 88%. In the creative practice stage, hierarchical teaching focuses on the construction of human-machine collaboration mode, which is based on project-driven and cross-disciplinary integration, and designs open innovation tasks for high-level students. For example, in information technology engineering courses, the artificial intelligence system can be responsible for providing massive data support, automated process processing, and preliminary scheme simulation, while students focus on creative conception, critical assessment, complex decision-making, which are the fields of human intelligence advantages. At this time, teachers design differentiated creative scaffolds according to hierarchical goals, such as setting the project "investigating the cost function of the enterprise and combining the image to put forward optimization suggestions" for the expansion level students. In the process, AI tools assist in completing data visualization model calculation, and student groups work together to interpret and iterate the scheme. This human-machine collaboration not only improves the quality of creative output but also cultivates students' teamwork and cross-disciplinary integration ability. According to statistics, after adopting hierarchical project-based learning, the proportion of deep questions raised in the classroom can be increased from 15% to 40%. Overall, the hierarchical teaching application design organically combines AI-assisted basic training with human-machine collaborative creative practice, and constructs a new teaching paradigm that integrates teaching students in accordance with their aptitude" and "technology empowerment" through precise diagnosis of learning conditions, dynamic goal stratification, and intelligent resource push, so as to promote the comprehensive

improvement of students' knowledge construction, skill development, and innovative literacy while respecting individual differences of students.

4.2 In-depth analysis of typical lesson cases

In the in-depth analysis of typical lesson cases, artificial intelligence technology has been deeply integrated into the artistic education links such as script creation, storyboard design, and comprehensive performance, showing significant advantages in improving creative efficiency and reducing technical barriers. In the scriptwriting workshop, the intervention of AI is mainly in the level of structured thinking guidance and iterative optimization. For example, the "Scriptwriting Workshop" system developed by the Shanghai Theatre Academy requires creators to follow a progressive process from basic, script outline, act outline to scene outline, controlling the direction of generated content through clear and specific prompt words, avoiding the inherent mechanical repetition or plot jumps of AI; practical show that this structured method enables high school Music theatre clubs to complete the creation of a complete script framework with 4 characters in 3 class hours, while traditional models consume several times more time, and the completion rate of group composition tasks under AI assistance has increased from 45% to 100%, achieving the democratization of creation for students with zero basis. The application of generative technology in the storyboard design course focuses on visual consistency and dynamic presentation, such as the Amazon Nova Canvas tool, which fixes character appearance and style through the configuration of seed parameters and style description words, ensures narrative coherence, and the DeepSeek and FLUX workflow combined can generate storyboard pictures that meet the professional camera, and then convert them into dynamic scripts through video generation tools such as Canvas, etc. This kind of technology enables small film and television teams to perform zero-cost shooting, greatly reducing on-site communication costs. In the full-process AI-assisted practice of comprehensive performance projects, taking the original Music theatre "Youth under the Pen" a high school in Shanghai as an example, Students adopt a dual-guidance note-assisted mode, use DeepSeek to construct the script structure, complete the composition and arrangement ChordPulse, and solve the copyright ethics and emotional thinness problems of AI-generated content under the supervision of teachers, such as starting a three-level response mechanism when similarity of AI composition and existing works reaches 72%, and finally complete the creation of a 40-minute play in 16 class hours, verifying the feasibility of human-computer collaboration in art education. These cases show that AI technology provides replicable creative paradigms for education scenarios through standardized processes and data-driven capabilities, but its core still relies on the intervention of human tutors in terms of artistic authenticity control and ethical norms.

4.3 Construction of the teaching evaluation system

The construction of a teaching evaluation system is particularly important in the context of AI-generated content increasingly integrated into art education, with its core task being the establishment of scientific and reliable standards for artistic evaluation of generated content and a quantitative tracking mechanism for the development of students' creativity, thus precise diagnosis and continuous optimization of teaching quality. In terms of the artistic evaluation standards for generated content, the evaluation system needs to break through the traditional subjective evaluation framework and instead construct a-level evaluation model integrating technical

indicators and aesthetic dimensions. For example, by drawing on the teaching system quality evaluation indicators under the DCR paradigm, the artistic nature can be deconstructed into creative uniqueness, emotional appeal, technical completion, and cultural fit, which are quantifiable elements. Among them, creative uniqueness can be evaluated by comparing the similarity of generated content with existing works through algorithms. The ideal threshold should be set to ensure originality when the similarity is below 15%. Emotional appeal is considered effective resonance when the amplitude of physiological data feedback of students after watching the performance, such as the fluctuation of the galvanic skin response, is greater than 0.5 microsiemens. Technical completion to examine visual parameters such as the fluency of lines and the coordination of colors. Cultural fit can be detected by a semantic analysis tool to match the generated content with the target cultural. Finally, a weighted comprehensive evaluation formula is formed: Artistic score = 0.3 × Creative uniqueness 0.4 × Emotional appeal 0.2 Technical completion 0.1 × Cultural fit, ensuring that the evaluation results are both objective and interpretable. At the same time, the quantitative tracking of students' creativity development relies on a multi-modal data collection and dynamic analysis model. Its foundation is the design of a three-layer indicator framework covering cognition, behavior, and outcomes. On the cognitive level, the change of students' divergent thinking is evaluated by comparing pre- and post-tests. For example, the improvement rate of the scale score of the Torrance Creative Test needs to reach more than 20% to be considered significant progress. On the behavioral level, the interaction frequency, the number of modifications and iterations, and the of interdisciplinary knowledge application in AI-assisted creation are recorded. For example, each effective modification can correspond to an increase of 5 points in the creativity index. On the outcome, the focus is on the novelty, complexity, and influence of the work. For example, the expert blind review scoring system (full score of 10, benchmark of) is introduced and combined with the algorithm to automatically identify the proportion of non-traditional elements in the work (such as surreal composition ratio exceeding 30% can be scored) To achieve the continuity of tracking, the evaluation system should be embedded in a formative assessment cycle, with at least three stage assessments per semester, and the growth curve of students' is visualized through a learning analysis platform. For example, the data of a pilot project show that the average comprehensive creativity score of students participating in AI drama creation has increased by 5% in half a year, with the incidence of high-risk attempt behaviors (such as subversive plot design) increasing from 10% to 40%, fully demonstrating the guiding value of quantitative tracking for teaching intervention. In short, the teaching evaluation system not only improves the accuracy of art education evaluation by quantifying artistic standards into computable, but also promotes the evolution of the teaching paradigm towards a data-driven and human-oriented direction.

5. Practice case comparison study

5.1 Comparison of application models of different institutions

Different institutions show distinct characteristics in their application models of the integration of AI and education, with specialized institutions tending to adopt the technical deepening model, focusing on specific art fields for tool innovation and process reengineering to achieve a qualitative leap in teaching efficiency, while comprehensive universities rely on multidisciplinary depth to build a cross-

disciplinary integration model, emphasizing the stimulation of innovative potential through knowledge intersection and platform synergy. The technical deepening model of specialized art institutions on tool empowerment and scene adaptation, such as the Shanghai Institute of Visual Arts, which has been systematically constructing an AI curriculum system since 2023, launching more than20 AI-integrated courses in three semesters, covering professional modules from AI visual art design to AI creative writing, and its technical deepening is reflected in the deep embedding of tools such as Stable Diffusion into the teaching of storyboard design, compressing traditional hand-drawn tasks that took dozens of hours into minutes, with an efficiency improvement of more 60%. These institutions often build a progressive path of "basic layer-enhancement layer-expansion layer" (such as the hierarchical teaching model of Shanghai Theatre Academy, first enabling students to master core technologies such as prompt engineering, and then introducing multi-modal generative technology in the creative process to optimize emotional expression. Data show that this deep technology has increased the completion rate of student projects from 45% to 100%. In comparison, the cross-disciplinary integration model of comprehensive universities is characterized by the use of the knowledge graph and system integration, such as Tsinghua University, which uses its self-developed large model with a billion parameters, GLM4, to build a cross-disciplinary platform. piloting the development of dedicated AI teaching assistants in 8 courses to achieve full-process support from automatic question generation to personalized tutoring. Its integration logic is to down disciplinary barriers, such as Zhejiang University's "Intelligent Sea Platform", which connects different disciplinary knowledge points through a micro-course structure, forming "AI " course clusters to promote long-distance interdisciplinary integration among literature, science, engineering, and medicine. This model relies on the diverse disciplinary foundation of universities. According to the 024 case statistics of the Ministry of Education, about one-third of the 165 cross-disciplinary disciplines built by 35 first-class universities involve the liberal arts and science disciplines, reflecting the structural advantages of comprehensive universities in solving complex problems. The two models have different emphases in terms of goal orientation and resource allocation. Specialized art institutions emphasize the vertical depth of technology application, usually through the studio system (such as the art and design studio of industrial education integration) to seamlessly connect AI tools into the process, enabling students to quickly improve their professional practice ability in "learning by doing"; while comprehensive universities focus on the breadth construction of the innovation network, such as Sichuan University, which revises the training program to set up cross-disciplinary degree majors and builds multi-disciplinary research platforms to train students' teamwork and complex problem-solving abilities in a-level environment. Despite different paths, both point to the reform of the talent training paradigm, with the technical deepening of specialized institutions ensuring the professionalism and cutting-edge nature of art education, and the disciplinary integration of comprehensive universities expanding the boundaries of innovation, jointly promoting the digital transformation and upgrading of education.

5.2 Comparison of Generating Techniques Differences

The application differences of generative technology in music theatre education are significantly reflected in two dimensions: the teaching of text-dominant and multi-model tools and the teaching adaptability of open-source and commercial tools.

Text-dominant generative technologies, such as the GPT series, mainly focus on linear narrative links such as scriptwriting and lyric generation based on natural language processing capabilities. Its teaching effectiveness is reflected in the improvement of creative efficiency and basic skill training. For example, the use of DeepSeek in high school Music theatre projects can reduce the writing time of a complete framework with four roles from several weeks in the traditional model to within three hours. The completion rate of students' scripts has jumped from 45% to 100%. However, the integration capability of such tools for visual or auditoryodal elements is relatively weak, resulting in obvious limitations in teaching scenarios that require cross-sensory collaboration. In comparison, multi-model generative technologies, such as visual generation with Stable Diffusion and music generation tools like AIVA, have achieved all-round optimization of teaching effectiveness through the fusion output of text, images, and sounds. For, in the storyboard design course, multi-model tools can generate visual images and music schemes simultaneously, allowing students to adjust the composition and music parameters on the same interface. The evaluation shows that the average score of students' cross-modal narrative ability test has increased by 28%, and the accuracy of emotional expression has increased from 58% to 89%. This benefits from the multi-model technology's quantitative analysis capability of emotional expression elements. For example, by analyzing the emotional curve of the lines, the is automatically matched to enhance the audience's emotional resonance intensity by 35%. However, Multi-model tools have high computational resource requirements and may increase the cognitive load of. In terms of teaching adaptability, open-source and commercial tools show distinct ecological characteristics. Open-source models such as DeepSeek-R1 and ChordPulse use community collaboration and transparent algorithms to reduce the technical threshold. Their free characteristics enable resource-constrained schools to quickly deploy applications. For example, primary and secondary schools rely onordPie to meet 70% of the basic music composition needs, achieving zero-cost empowerment for non-professional students to create. Moreover, the customizability of opensource models allows teachers to adjust parameters according to teaching needs, such as style migration through modified prompt words. However, open-source tools often lag behind commercial products in terms of professionalism and stability, and the lack of official technical support may lead to teaching interruptions. Commercial tools, such as some professional music generation software, provide standardized interfaces and continuous updates. For example, an intelligent teaching assistant developed by an education technology company based on an open-source base and trained with industry data performs close to a customized model in mathematical reasoning tasks. Its teaching function can automatically analyze progress and student participation data, improving teacher decision-making efficiency by 40%. However, the high purchase cost and data privacy agreement of commercial tools may reduce their popularity, especially for budget-stretched educational institutions. Overall, the difference in the effectiveness of text-dominant and multi-model technologies is essentially a balance between the precision and comprehensiveness of tools. The choice between open-source and commercial models needs to balance cost control and professional needs. Both together promote the precision application of generative technology in teaching scenarios.

6. Conclusions and Insights

6.1 Paradigm reconstruction of teaching

The deep integration of artificial intelligence technology into art education is driving a fundamental shift in the paradigm of teaching from traditional transmission to human-machine collaborative creation. This restructuring process is not only reflected in the quantitative improvement of the quality of students' works, but also provides feasible paths for macro-level education reform through micro-practice, while also triggering profound reflection on the ethics of technology, especially the construction of the boundaries of creative subjectivity and art education ethics. On the of student work analysis, the application of AI-assisted tools has significantly improved the efficiency and diversity of creation. For example, after the introduction of generative AI in music theatre teaching, the time for students to complete the script has been compressed from several weeks in the traditional model to within 3 class hours, the completion rate has leaped from 45% to100%, and the coefficient of variation of the style of the work has been improved from 0.3 to 0.7, indicating that AI can quickly synthesize cross-regional and cross-temporal artistic elements, but it also brings challenges to the quantification of emotional depth - based on facial expression recognition data analysis, the emotional peak intensity of AI-generated character monologues is 15% to 20% lower than that of human creation, which reveals the tension between technology-empowered and humanistic. The core of the restructuring of the teaching paradigm is the shift from teacher-centered skill transmission to human-machine collaborative creation ecology, and micro-practices such as the grouping of AI tools in stratified teaching according to the pre-diagnosis data of students, providing high-frequency repeated training for students in the basic layer to improve the efficiency of skill mastery by about 40%, while students in the expansion layer stimulate high-level thinking through open exploratory tasks. The inspiration of such practices for macro reform lies in the construction of a "data-driven personalized" education model. According to the practice data, the average score of students participating in such models in creativity tests increased by 3%, and the incidence of high-risk attempt behavior increased from 10% to 40%, fully proving that micro-innovation can promote systemic change. Theological ethics reflection focuses on the issue of the boundary of creative subjectivity, and the core position of human authors in traditional art education is challenged by AI-generated content, for example, when AI tools autonomously complete 70% of the basic composition, how to define the contribution of students' originality becomes a controversial focus, and the ethical construction of education in the age of artificial intelligence needs to be based on the principle of "human-machine co-existence", and balance innovation and responsibility by setting data use norms and algorithm standards, for For example, by introducing anonymous processing and informed consent mechanisms in the application of educational big data to prevent the homogeneity of student creativity caused by data abuse, the lack of an ethical framework may lead to the loss of ethical norms and the need for macro policies to incorporate ethics education into the curriculum system, and cultivate students' ability to maintain critical thinking and authenticity in human-machine collaboration.

6.2 Future development direction

The future direction of dramatic education will deeply integrate adaptive learning systems and cross-media narrative technology, constructing a new paradigm of personalized teaching. The adaptive learning system realizes the transformation from "one-size-fits-all" to "thousands of people with thousands of faces" teaching

through data-driven dynamic adjustment. For example, in the drama classroom, the system can construct a learner's portrait based on multi-dimensional data such as students' answering behavior, learning duration, and wrong questions, and then push customized content, which can improve learning efficiency by more than 40%. Cross-media narrative technology, on the other hand, breaks the narrative boundaries by integrating medium tools such as VR, AR, and video recording. For instance, in the "Daiyu's Flower Burial" project, the Shanghai Drama uses XR technology to integrate virtual scenes with the real stage, creating an immersive opera experience. Its teaching integration path needs to rely on the "hardware software service", constructing a closed system from resource generation to interactive feedback. For example, through the virtual reality environment, students can "immerse themselves" in the role's emotions, making the audience's immersive score reach 4.7/5.0. In addition, cross-media narratives need to strengthen interdisciplinary intersections, such as combining drama with history literature, music, and using cloud platforms to share resources and introduce AI-assisted programming tools to optimize interactive logic. The future direction emphasizes human-machine collaboration. For example, the1 1 3 X Y" resource platform planned by the Shanghai Drama Academy embeds adaptive systems and cross-media technology into the entire creative process, optimizes teaching through algorithms that monitor physiological signals in real-time, and also pays attention to the construction of ethical frameworks to balance technological innovation and artistic authenticity.

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