EVALUATE THE IMPACT OF APPLICATION OF DEEPSEEK FOR HIGH SCHOOL STUDENTS IN DRAMA CREATION

Jianghan OU[1] and Supavadee POTIWETCHAKUL[1]
1 Faculty of Fine and Applied Arts, Suan Sunandha Rajabhat University, Thailand;
s68563806003@ssru.ac.th (J. O.); supavadee.po@ssru.ac.th (S. P.)

ABSTRACT
This Article aim to evaluate the impact of application of DeepSeek for high school students in drama creation. The study is situated at Sichuan Film and Television University Experimental Senior High School, Chengdu, Sichuan Province, China. The research incorporates classroom observations, semi-structured interviews, and questionnaire surveys to comprehensively assess the tool's effects on students' creative processes and outcomes. Preliminary findings suggest that DeepSeek significantly enhances students' creative efficiency, alleviates creative anxiety, and facilitates more effective collaboration between teachers and students during the drama production process. However, challenges such as limitations in emotional expression, risks of creative homogenization, and potential over-reliance on AI-generated content were also identified, necessitating a balanced, human-machine collaborative pedagogical framework. Beyond immediate pedagogical outcomes, this project endeavors to cultivate future-critical competencies and strengthen technological fluency among secondary education learners, building foundational readiness for successful adaptation to emerging digitally-driven intelligent environments.
Keywords: Evaluate the Impact, Application of DeepSeek, High School Student, Drama Creation

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INTRODUCTION

The rapid advancement of artificial intelligence (AI) is fundamentally reshaping artistic creation. In education, integrating AI tools to enhance pedagogy has become increasingly important. DeepSeek, an emerging open-source large language model (LLM) known for its Mixture-of-Experts (MoE) architecture and Multi-Head Latent Attention innovations (Joshi, 2025), is highly accessible and intuitive for student use. At Sichuan Film and Television University Experimental Senior High School, DeepSeek has become the most frequently used tool for scriptwriting, stage design, and promotional material creation. While AI integration in education is a broad trend, its specific impact on students' creative processes in specialized arts contexts requires focused investigation. This study addresses a central question: What is the tangible impact of DeepSeek on high school students' drama creation. Evaluating this impact is significant for multiple stakeholders. For students, DeepSeek can alleviate creative anxiety, overcome conceptual blocks, and enhance stage presentation, while fostering greater autonomy and creative coherence. For teachers and the educational system, understanding this impact provides critical insights for optimizing pedagogy and developing AI-aligned curricula.

This case study focuses on 15 drama performance majors at the school, supported by teacher interviews and audience feedback. It explores key questions: How does DeepSeek affect students' creative self-efficacy and confidence. Does it improve their work in scriptwriting, stage design, and promotional materials? What difficulties do students face, and how do teachers and audiences perceive the changes? By answering these questions, this research aims to provide actionable data to refine pedagogical integration, establish best practices, and offer a replicable model for AI-assisted arts education. Ultimately, this systematic evaluation seeks to move from theoretical potential to practical evidence, contributing to arts education and educational technology. The findings will guide educators, curriculum developers, and policymakers in responsibly leveraging AI to foster creativity and skill development, creating a more effective, empowering, and humanistic learning environment enhanced by intelligent tools.

Article's Objective: To evaluate the tangible impact of DeepSeek application on high school students' drama creation, specifically encompassing scriptwriting, stage design and promotional materials.

LITERATURE REVIEWS

1) Performance of DeepSeek

DeepSeek distinguishes itself through its computationally efficient architecture, specifically integrating Multi-Head Latent Attention (MLA) and Mixture-of-Experts (MoE) to achieve frontier-level performance with reduced inference costs (Xiong et al., 2025). It demonstrates strong capabilities in text-based reasoning and knowledge-intensive tasks, yet exhibits notable limitations in multimodal and visual reasoning domains, including hallucination risks that necessitate complementary human oversight. Overall, DeepSeek excels in text and logic-intensive creative tasks but requires human supervision in visually intensive or multimodal applications.

2) Foundational Visions: Licklider and Engelbart

The intellectual origins of HAIC (Human-AI Collaboration） theory can be traced to J. C. R. Licklider's 1960 paper "Man-Computer Symbiosis." Licklider (1960) proposed a close, intimate coupling between humans and computers, using the biological metaphor of symbiosis rather than master-servant. He envisioned a division of labor where humans set goals, hypothesize, and evaluate, while computers handle routine computation. Most importantly, he framed the computer as a "colleague" that assists in formulative thinking—the messy, intuitive process of defining problems and exploring creative possibilities.

In contrast, Douglas Engelbart (1962) emphasized computers as tools to augment human intellect. While Licklider stressed partnership, Engelbart stressed instrumental augmentation. However, both agreed on the necessity of close, continuous interaction. Engelbart's 1968 "Mother of All Demos" (mouse, GUI, hypertext) demonstrated technical feasibility (Tong, 2025).

Taken together, Licklider and Engelbart established two enduring orientations in HAIC theory. Licklider's "colleague" orientation emphasizes cognitive co-operation and mutual adaptation; Engelbart's "tool" orientation frames computers as instruments for extending human capability. This distinction remains significant in contemporary educational debates, where AI may be positioned either as an assistive tool or as a semi-autonomous creative partner.

3) Contemporary Frameworks: Human-Centered AI and Symbiotic Intelligence

Recent scholarship has extended these foundational ideas. Tong (2025) identifies two main lines of development: human-centered AI (AI as a "super tool" designed to serve human goals) and symbiotic intelligence (mutual adaptation and co-evolution between humans and AI). Fragiadakis et al. (2024) propose three HAIC modes: AI centered (AI leads), human-centered (human leads), and symbiotic collaboration (shared leadership).

A key insight from Tong (2025) is the performance paradox: in judgment and decision making tasks, human-AI teams often underperform AI alone (negative synergy), whereas in content creation and problem formulation, they outperform (positive synergy). Creative fields, including drama education, thus benefit from positive synergy. The causes include algorithm dynamics, human cognitive biases, and skill degradation. Lasting gains come from treating AI as an internalized cognitive component rather than an external oracle. Yi and Han (2025) argue for a shift from blended teaching to "human-AI collaborative teaching," where AI deeply participates in instructional design, content generation, and feedback.

Across the reviewed literature, several tensions emerge. First, agency allocation remains contested: how much decision-making power should be delegated to AI? Second, the performance paradox raises questions about task types: why do creative tasks benefit from collaboration while analytical tasks do not? Third, trust calibration— matching trust levels to AI's actual capabilities—is underexplored in educational contexts. These gaps motivate the present study's focus on drama education, a paradigmatic creative domain.

4) Conceptual Framework

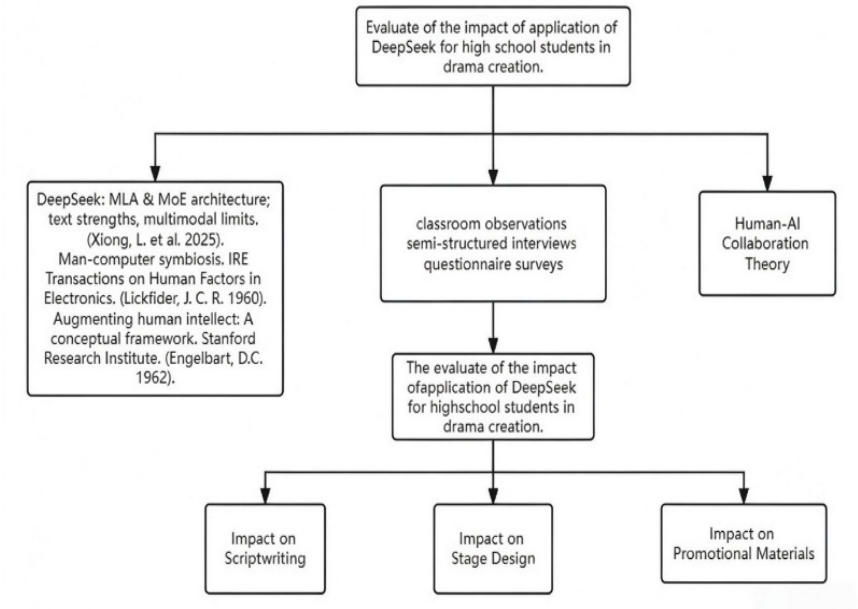


Figure 1 Conceptual Framework
Source: Compiled by the Researcher

RESEARCH METHODOLOGY

This study adopted a mixed-methods approach to evaluate the impact of DeepSeek on high school students' drama creation. The methodology is detailed in the following separate points:
1) Classroom Observations: Over a 10-week period, 10 classroom observations (90 minutes each) were conducted with 15 drama performance major students. These observations covered three stages: scriptwriting, stage design, and promotional material production. Structured observation forms were used to record usage frequency, questioning strategies, interaction depth, and classroom dynamics.
2) Semi-structured Interviews: Semi-structured interviews were conducted with three subject teachers and eight students (30-60 minutes each, Weeks 5-8). The interviews explored participants' attitudes, usage patterns, content processing, challenges, and role changes. All interviews were audio-recorded, transcribed verbatim, and thematically analyzed.
3) Questionnaire Surveys: Questionnaire surveys were administered to 15 students (pre- and post-intervention in Weeks 1 and 10) and 45 audience representatives (after the final performance). The surveys measured perceived usefulness, perceived ease of use, creative self-efficacy, human-AI collaboration, and work quality.
4) Triangulation and Data Analysis: By triangulating interview, observation, questionnaire, and document data—comparing student self-reports, observed behaviors, creative outputs, and teacher perspectives—the study enhanced the diversity, reliability, and depth of the research findings.

RESEARCH RESULTS

Table 1 Participant Profile and Data Sources

Item	Category	N
Students	Total participants	15
	Male	8
	Female	7
	Grade 12	15
Teachers/Student	Specialized subject teachers / Students	3/8
Data sources	1) Questionnaire valid returns	15
	2) Student interviews	8
	3) Teacher interviews	3
	4) Classroom observations	10

Note. N = 15 students, 3 specialized subject teachers, and 10 classroom observations. The participant profile summarizes the demographic information and the corresponding data sources for this mixed-methods study.

The results of the study on the impact of using the DeepSeek application for high school students in drama creation revealed that DeepSeek positively influenced students' creative processes. The specific findings across the three core stages—scriptwriting, stage design, and promotional materials, along with students' overall self-efficacy are detailed in the following sections.

1) Impact on Scriptwriting

Quantitative data indicate that DeepSeek significantly assists students in scriptwriting. High evaluations were received for overcoming writer's block, generating dialogue drafts, and providing plot variation suggestions. Students generally reported modifying AI suggestions before use, indicating that students do not passively accept AI output. However, the evaluation of the originality of AI-generated content was only at a moderate level.

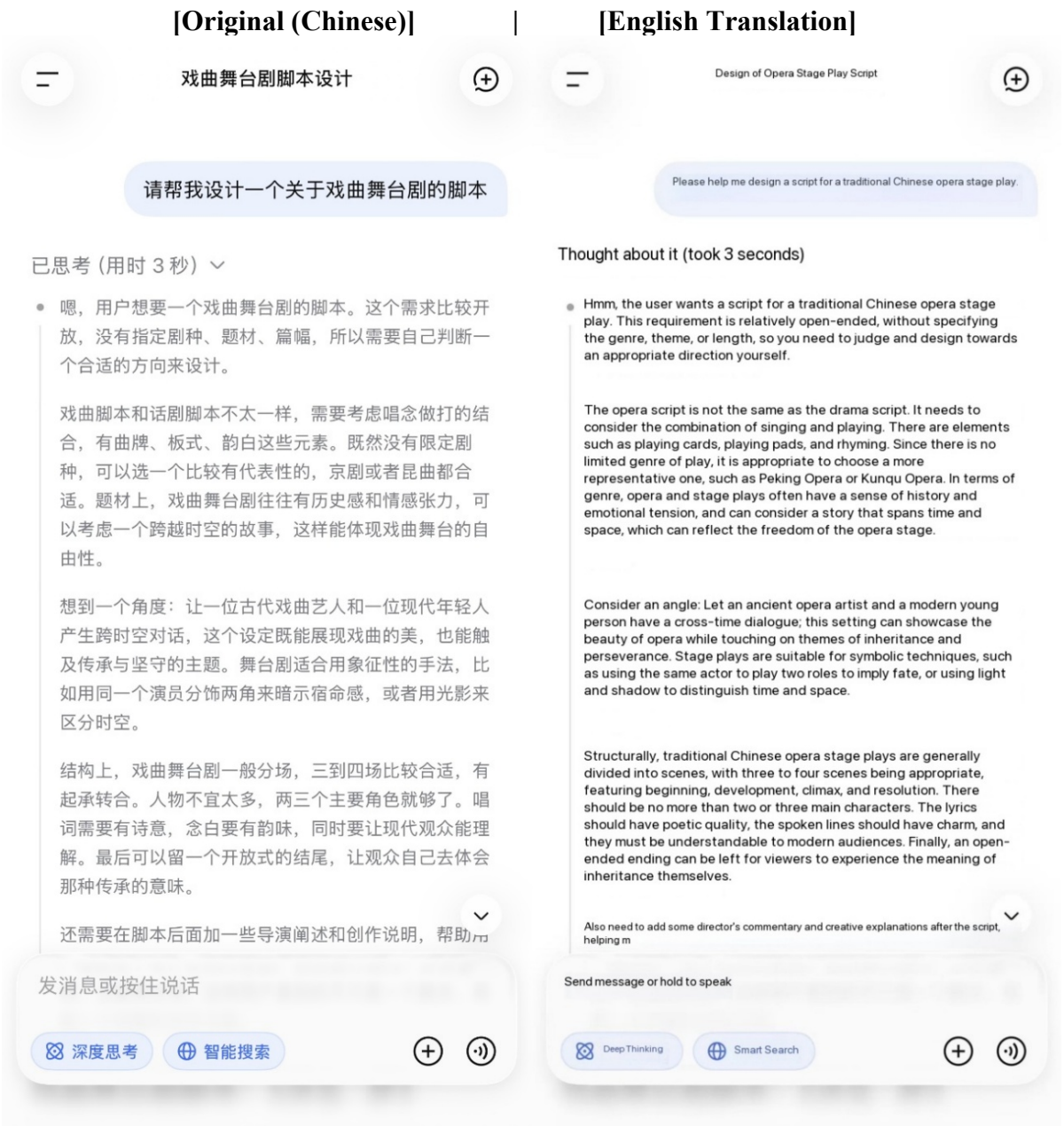


Figure 2 illustrates a typical interaction in which a student prompts DeepSeek to design a traditional Chinese opera script. The AI's reasoning process demonstrates how it assists in defining the genre, plotting the narrative structure, and setting character dynamics, functioning as a "creative assistant" rather than a mere content generator.
Source: Screenshot by the author from the DeepSeek experiment.

Interview findings further corroborated these results. Seven out of eight student interviewees reported that DeepSeek helped them "get started" when facing a blank page. One student stated: "When I don't know what the characters should do, I ask DeepSeek for a few options, then I pick and rewrite them to fit the characters' personalities."

2) Impact on Stage Design

In stage design, DeepSeek also received positive evaluations. Students reported high levels of assistance in transforming textual descriptions into visual stage settings, improving understanding of spatial arrangements, and providing suggestions for lighting and props. The practical feasibility of stage design suggestions received moderate evaluations. Notably,

students' reliance on DeepSeek for stage design decisions was low, indicating that students maintained a high degree of autonomy.

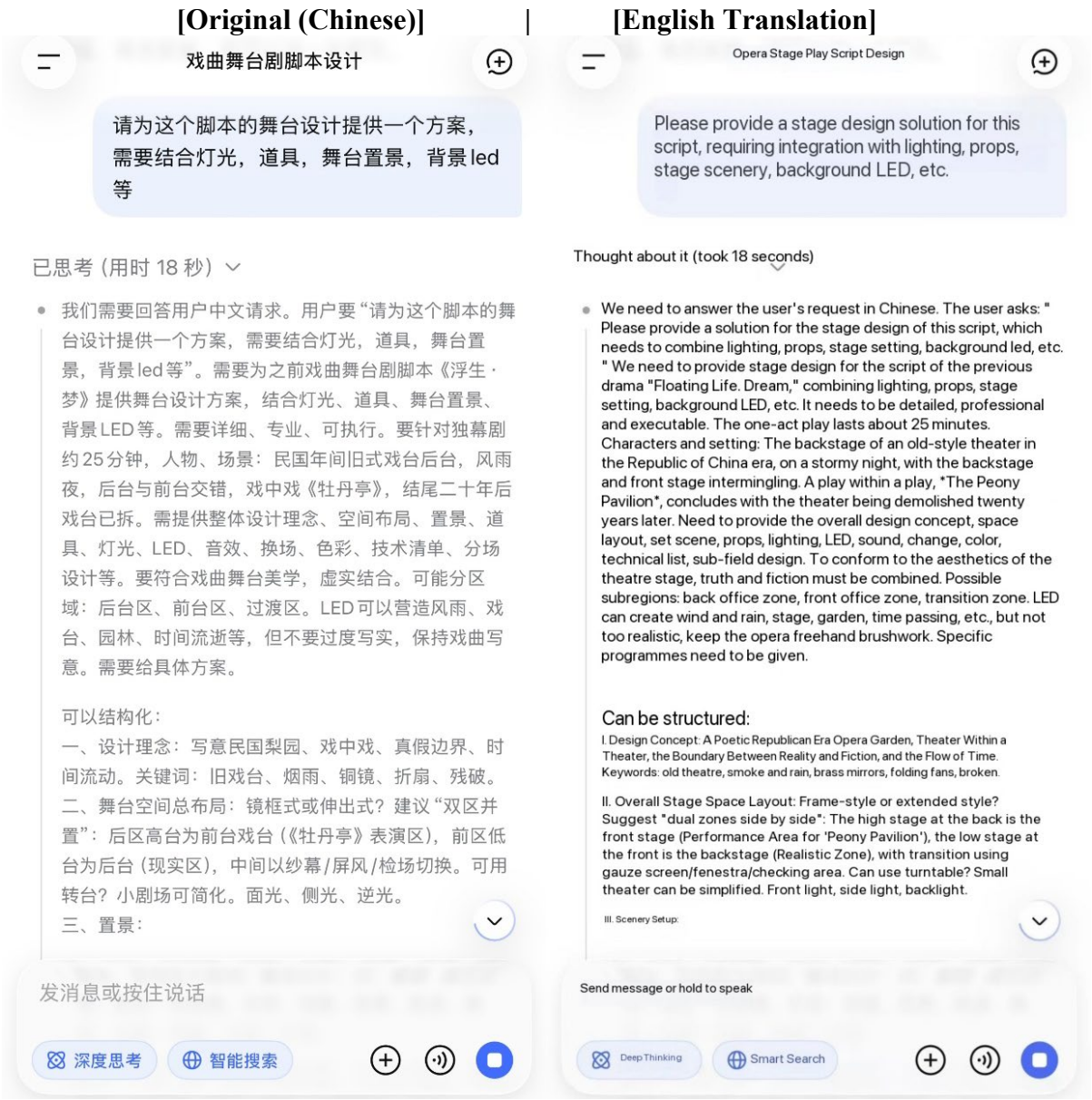


Figure 3 illustrates this process in detail, where the student prompts DeepSeek to design a stage plan for a specific script. The AI's reasoning process demonstrates its ability to synthesize spatial arrangement (e.g., dual-zone layout), lighting, props, and LED backgrounds, functioning as a "creative assistant" to overcome students' limitations in spatial imagination. Source: Screenshot by the author from the DeepSeek experiment.

Observational data showed that students frequently used DeepSeek to generate detailed descriptions of stage environments, which they then translated into visual sketches and prop lists. Teachers observed that students' stage designs became more detailed and varied after the intervention. One teacher noted: "Students who previously struggled with spatial imagination now produce more sophisticated designs. They still make the final creative choices, but DeepSeek expands their possibilities."

3) Impact on Promotional Materials

DeepSeek received high evaluations across all aspects of promotional material creation, including copywriting, short video script ideas, and overall quality improvement. Students also reported greater confidence in producing promotional materials. Additionally, students recognized that promotional content required significant revision, reflecting a critical rather than passive attitude toward AI output.

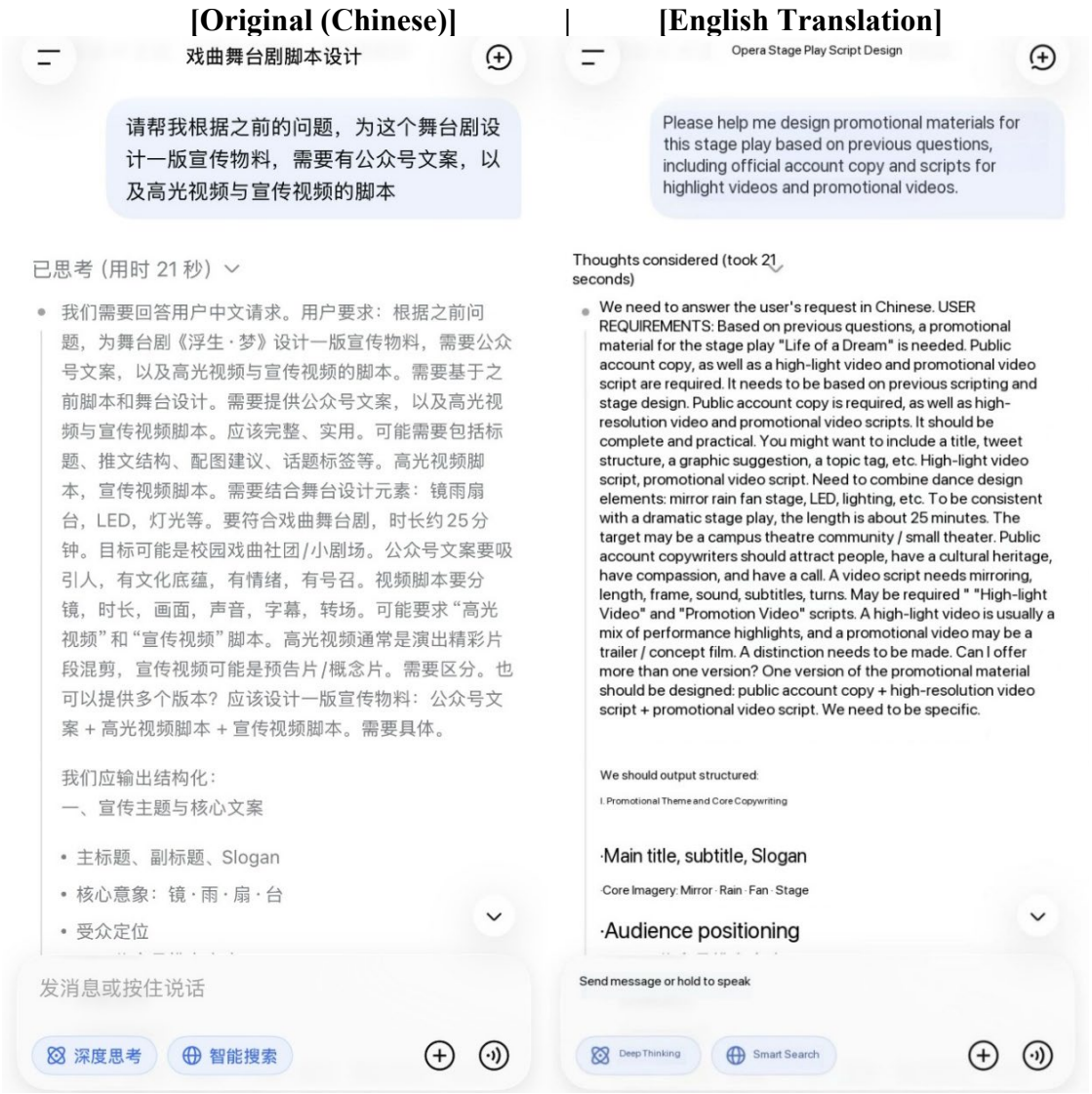


Figure 4 Example of DeepSeek's reasoning process during the promotional material creation phase. The AI outlines a structured plan for generating social media copy, highlight video scripts, and promotional video scripts based on the specific stage design elements and target audience.
Source: Screenshot by the author from the DeepSeek experiment.

The study also found that the application of DeepSeek enhances performance in other aspects of drama creation, namely the overall professional quality of the final production, teacher-student collaboration, and student engagement. As illustrated in Figure 5, the final theatrical performance of *The Protagonist* achieved a high level of visual and structural polish. These additional findings suggest that integrating DeepSeek not only supports the specific technical stages of drama creation but also positively transforms the broader pedagogical and collaborative dynamics of high school arts education, as follow:

1) Overall Self-Efficacy and Creative Confidence

Regarding overall self-efficacy, students gave high ratings to the reduction of creative anxiety after using DeepSeek, confidence in their creative abilities, and their identification as the primary creator. The highest score was given to the recommendation that DeepSeek should be used more extensively in drama classes. Concerns about decreased originality due to DeepSeek use were only at a moderate level.



Figure 5 Final theatrical performance of The Protagonist (Zhu Jue) by high school students. The production integrated AI-assisted scriptwriting, stage design, and promotional materials. Source: Photographed by the author at the experimental teaching site (Author's research data, photograph taken with permission.)

2) Teacher and Audience Perceptions

Teacher Interview Findings: Three subject teachers all reported positive changes, including increased student engagement and reduced frustration during scriptwriting phases. Teachers noted that students asked more sophisticated questions after using DeepSeek, demonstrating deeper engagement with their creative work. However, one teacher expressed concern about the potential risk of creative homogenization, stating: "We need to ensure students don't just copy, but truly internalize and transform what AI provides."

Audience Evaluation Results: Forty-five audience representatives evaluated student performances and promotional materials. 82% reported that the works were "more polished" compared to previous student productions, and 76% noted that the stage designs felt "more professional." However, 34% of audience members noted that some works felt "somewhat similar" to each other, pointing to the risk of homogenization.

Table 2 Integrated Qualitative Evidence from Interviews and Observations

Theme	Source	Representative evidence
Efficiency in scriptwriting	Student S1	"The answers provided by DeepSeek helped me quickly find a line of thinking."
Creative inspiration	Student S3	"I had never thought of this point before, and I felt a bit excited."
Modification and ownership	Student S5	"I think our previous plan is better, and it also fits our creative philosophy."
Teacher role change	Teacher T2	"During class, it is still relatively much easier; more of the work is guiding students to think independently."
Classroom design importance	Teacher T3	"It still enriched the teaching process to a certain extent and also livened up the classroom atmosphere."
Frequency of DeepSeek use	Observation	Scriptwriting: [5]/10; Stage: [4]/10; Promotion: [1]/10

Note. N = 15 students. The questionnaire data were analyzed for reliability and descriptive statistics. As shown in Table 2, all core constructs demonstrated acceptable reliability. Perceived usefulness and human-AI collaboration received the highest mean scores.

Table 3 Summary of Evaluation Results

Dimension	Key Findings
Participants	15 Grade 11 drama performance majors; 8 male, 7 female (60%); approx. 1 year of drama study; 100% had used DeepSeek for scriptwriting.
Scriptwriting	High ratings for overcoming writer's block, generating dialogue drafts, and providing plot variations; students modified AI suggestions; moderate originality rating. 7/8 interviewees reported DeepSeek helped them "get started".
Stage Design	High assistance in transforming text into visual settings, spatial arrangement, lighting, and props; moderate practical feasibility; low reliance on AI for final decisions; teacher observed more detailed and varied designs.
Promotional Materials	High ratings for copywriting, short video script ideas, and overall quality improvement; greater confidence; students recognized need for significant revision.
Overall Self-Efficacy	High ratings for reduced creative anxiety, confidence, and identification as primary creator; highest score for recommendation to use DeepSeek more widely; moderate concern about decreased originality.
Teacher Perceptions	Increased student engagement and reduced frustration; more sophisticated questions; one teacher expressed concern about creative homogenization.
Audience Perceptions	45 representatives; 82% reported works "more polished"; 76% felt stage designs "more professional"; 34% noted works felt "somewhat similar" (homogenization risk).
Additional Findings	Improved overall professional quality, teacher-student collaboration, and student engagement; final performance achieved high visual and structural polish.

DISCUSSION & CONCLUSION

1) Discussion

The findings of this study demonstrate that DeepSeek has a predominantly positive impact on high school students' drama creation across all three key areas: scriptwriting, stage design, and promotional materials. These results align with the theoretical framework of Human-AI Collaboration (HAIC) and specifically support the "performance paradox" identified by Tong (2025), wherein creative tasks benefit from positive human-AI synergy while judgment tasks do not.

1.1 Scriptwriting and Formulative Thinking

The high mean scores for overcoming writer's block and generating dialogue drafts support Licklider's (1960) concept of "formulative thinking." Students use DeepSeek to engage in the messy, intuitive process of exploring creative possibilities, with the AI serving as a "colleague" that stimulates rather than replaces human cognition. The finding that students consistently modify AI suggestions confirms that human agency remains central, consistent with Yan's (2025) recommendation that AI should function as a "creative assistant" rather than an autonomous creator.

1.2 Stage Design and Visualization

DeepSeek's role in converting textual descriptions into detailed visual plans exemplifies the positive synergy identified by Tong (2025). Students who previously struggled with spatial imagination now use AI to generate detailed descriptions, which they then refine through their own aesthetic judgment. This aligns with the human-centered HAIC mode proposed by Fragiadakis et al. (2024), where AI expands creative possibilities without dominating student decision-making.

1.3 Agency Allocation

The consistently high scores for statements affirming student agency indicate that students maintain a clear sense of authorship. This supports Fragiadakis et al.'s (2024) human-centered HAIC mode, where students lead and AI supports. The "student-led, AI-assisted, teacher-guided" model (Wang & Ren, 2025) appears to be effectively implemented in this context.

2) Conclusion

This study systematically evaluated the impact of DeepSeek on high school students' drama creation at Sichuan Film and Television University Experimental Senior High School. Employing a mixed-methods approach with 15 drama performance majors, supported by teacher interviews and audience feedback, the research examined DeepSeek's effects across scriptwriting, stage design, and promotional materials.

The findings indicate that DeepSeek significantly enhances creative efficiency, alleviates creative anxiety, and facilitates more effective collaboration between teachers and students. Students reported higher confidence and self-efficacy in their creative work, with particularly strong positive effects in overcoming writer's block and generating visual design options. The human-AI collaborative approach yielded positive synergy, consistent with the performance paradox theory identified.

However, the study also identified significant challenges, including limitations in emotional expression, risks of creative homogenization, and potential over-reliance on AI-generated content. These challenges necessitate a balanced pedagogical framework that maintains human agency and fosters independent creative thinking.

The study confirms that AI tools like DeepSeek, when thoughtfully integrated into drama education, can transform teaching practices without replacing the essential human elements of artistic creation. The "student-led, AI-assisted, teacher-guided" model emerges as an effective framework for balancing technological efficiency with pedagogical integrity. The findings contribute actionable insights for educators, curriculum developers, and policymakers working

to prepare students for an increasingly digital future while preserving the humanistic core of arts education.

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