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The Effect of Drama Education on Enhancing Critical Thinking Through Collaboration and Communication

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Abstract: This study explores how collaboration and communication in drama education enhance students' critical thinking skills, guided by the core literacy framework (5Cs): collaboration, communication, critical thinking, creativity and cultural awareness. This framework, recognized as a foundation for 21st-century learning, forms the theoretical basis for the analysis of how group dynamics and expressive activities in theater contribute to cognitive and social skill development. Using a mixed-methods approach, this study surveyed 98 university students and conducted in-depth interviews with 15 participants to gather both quantitative and qualitative data. Regression analysis revealed significant positive effects of collaboration ($b = 0.436, p < 0.001$) and the interaction between collaboration and communication ($b = 0.236, p = 0.001$) on critical thinking. Qualitative findings corroborated these results, highlighting how structured collaborative practices systematically cultivate multiperspective analysis, problem solving and evaluative thinking. The findings underscore the synergistic relationship between collaboration and communication, emphasizing their combined role in cultivating critical thinking. Additionally, the study demonstrates that gender and role diversity influence how students develop core literacies, with female students excelling in emotional expression and communication, while male students show strengths in creativity and originality.

Keywords: collaboration; communication; critical thinking; drama education



Academic Editor: Marius Boboc

Received: 13 March 2025

Revised: 29 April 2025

Accepted: 30 April 2025

Published: 2 May 2025

Citation: Hu, Y., & Shu, J. (2025). The Effect of Drama Education on Enhancing Critical Thinking Through Collaboration and Communication. *Education Sciences*, 15(5), 565. <https://doi.org/10.3390/educsci15050565>

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1. Introduction

1.1. Drama Education and the 5Cs

Drama education has many positive effects on the overall development of students.

First of all, theater is typically a collective creative process where students learn to collaborate and co-create with others, developing essential teamwork skills. Through their participation in theater performances, they gain experience in coordinating tasks, solving problems, and working collectively toward a common goal. This teamwork experience enhances their leadership, communication, and coordination skills, providing a practical foundation for future collaborative endeavors (Rubin, 2025).

Secondly, drama education emphasizes the development of expression, presentation and non-verbal communication skills (Angelianawati, 2019) so that students can express their thoughts and feelings more confidently and clearly. In theater performances, students need to express the emotions and intentions of their characters through words, voice and body, which requires them to be more sensitive and nuanced in their expressions. Apart from this, this process simultaneously enhances students' communicative abilities through structured social interaction.

Thirdly, students become familiar with the dramaturgy concept through the literature of plays, characters and plots, increasing their ability to analyze and argue (Storm, 2016), which can lead to critical thinking and problem solving. Students gain the ability to ask more probing questions, relate the behavior to the plot and look at it from the points of view of different characters in character analysis and script interpretation. In addition, this added depth of thought makes students more careful when considering the details of the plot and the background.

Moreover, theater grants a space for creativeness, where students are able to use their creative thinking by presenting different ideas through acting and writing scripts (Nicholson & Bond, 2017). In this process, students have the chance to apply their own creative styles while representing the main ideas of the play, thus interpreting the plot and the characters in a way that is different from the usual performance.

Drama, together with its embedded cultural expression, contributes to students' knowledge of how to value different cultures, traditions and ways of life by means of role playing and scene interpretation (Munin & Efron, 2017). Through theater performance, students have the chance to play the roles of people of different backgrounds and cultures and to gain more knowledge about multiculturalism. This scenario can enable students to grow and develop intercultural communication skills. This can facilitate the widening of students' outlooks on life.

The core literacy framework, which serves as this study's theoretical model, is based on the five Cs: collaboration, communication, critical thinking, creativity and cultural awareness (Wei et al., 2020). This framework has gained recognition as the foundation of 21st-century learning (Wei et al., 2020) and is, therefore, widely applied in the field of drama education. Each aspect of the 5Cs is related to the multiple objectives involved in drama instruction. For example, collaboration and communication are essential in group performances and role play. Critical thinking is cultivated through character and script analysis. Furthermore, creativity and cultural awareness help students to broaden their involvement and enable them to view things in an innovative and insightful way. The 5Cs framework serves as the theoretical model for this research, in which we outline the research design and data analysis used to examine whether drama education enhances students' critical thinking through teamwork and communication.

Drama education has gained increased attention in recent years as a pedagogical tool for the development of key competencies among students, particularly in fostering communication, collaboration, critical thinking, creativity and cultural awareness (Kao & O'Neill, 1998; Neelands, 2009; West, 2021). Numerous studies have demonstrated drama's positive impact in terms of enhancing creativity and emotional intelligence (Alfonso-Benlliure et al., 2021). However, while creativity and emotional development have been well documented, fewer empirical studies have provided evidence of how drama education specifically contributes to the development of critical thinking within collaborative and communicative learning environments (Kao & O'Neill, 1998; Baldwin & Fleming, 2003). This gap is particularly noticeable in the context of tertiary education, where fostering higher-order thinking is crucial for academic and professional success.

This study addresses this gap by examining how collaboration and communication—two fundamental components of drama education—enhance students' critical thinking skills. Drawing on the core literacy framework (5Cs), which includes collaboration, communication, critical thinking, creativity and cultural awareness, this study seeks to demonstrate how drama-based activities can create cognitively rich learning environments. The integration of up-to-date research (e.g., Miller et al., 2023; Syukri et al., 2024) further strengthens the relevance of this investigation within the current educational landscape.

1.2. Collaboration and Communication Play a Crucial Role

The essence of cooperation and discussion is derived from previous research conducted by some of the most renowned thinkers in the fields of learning and psychology, who, often without deliberate effort, have placed greater emphasis on these concepts.

In education, Vygotsky's theory highlights the integrative role of social interaction in the teaching–learning process (Hargreaves & Elhawary, 2018). This theory suggests that learners acquire cognitive and linguistic capabilities by participating in a cooperative learning environment (Tran, 2013), where they are exposed to others and learn together. The role of drama in the classroom involves group performances, which foster a positive atmosphere among students and encourage them to collaborate on a project using their own ideas. As a result, this process contributes to the development of their cognitive and linguistic competences. John Dewey's theory of evolutionary education suggests that students can better develop integrative literacy and critical thinking by participating in collaborative activities in society or school (Herman & Pinard, 2015). In the collaborative process of drama education, students encounter various kinds of problems, which stimulates them to think, explore, analyze and solve such problems, enabling students to develop critical thinking.

In the field of psychology, Piaget's theory of cognitive development emphasizes the importance of social interaction in children's cognitive development (Ahmad et al., 2016). Children can better understand and adapt to their environments through collaborative activities or interactions with others. In addition, Albert Bandura's social learning theory emphasizes the importance of observing others, imitation and communicative learning (Khozin et al., 2024). This theory states that the social environment plays a key role in shaping an individual's behavior and cognition (Khozin et al., 2024). If students are placed in a performance situation, they will immerse themselves in the roles and better understand the story development and characterization of the characters. Through this, students' comprehension can be fully developed, which lays the foundation for the subsequent shaping of critical thinking.

1.3. Objectives of the Study

This study aims to achieve the following objectives.

1. To explore the impacts of collaboration and communication on students' critical thinking in drama education.
2. To explore potential trends based on gender, with the acknowledgment that the gender imbalance in the sample limits the ability to draw statistically significant conclusions. The analysis focus on identifying observable patterns, rather than inferring causal relationships or generalizable findings.
3. To investigate the role of drama performance and role-playing experiences in shaping students' learning outcomes, particularly in fostering critical thinking.

1.4. Significance of the Study

This study contributes to the growing body of research on drama education by providing both theoretical and practical insights. Theoretically, it enhances our understanding of how collaboration and communication, as elements of the core literacy framework (5Cs), facilitate the development of students' critical thinking skills. Practically, the findings offer valuable guidance for educators designing drama-based curricula aimed at fostering critical thinking and teamwork among students.

2. The Role of Drama Education in Promoting the Core Literacies: 5Cs

Drama education is a vital component to building students' primary literacy skills, which include collaboration, communication, critical thinking, creativity and cultural skills. In addition to artistic skills learning, social plays, involved role playing and script interpretations, students also enhance their mental, emotional and social development. Students develop cooperative learning by participating as a small group and preparing a play, which is later presented.

Collaboration is a process that involves learning together, sharing work and achieving group goals (Baker, 2015). When undertaking tasks like group performances, group creativity, as well as role interaction, demonstrate the need for participants to interact harmonically and share their experiences. For example, teamwork theory suggests that group work helps students not just to achieve teamwork goals but to also exceed their personal and group goals and outcomes (Wang & Huang, 2021). At the same time, structured joint activities play a significant role in communication and inter-cohesion among group members, beyond supporting collaboration in the performance art involved (Naughton, 2006).

Another merit of drama studies is also attributed to the fact that learners may widen their avenues of expression through communicating the feelings, thoughts and intentions of their characters through stage conversation rather than real-world talking. Communication pertains to employing different means (e.g., verbal, non-verbal, inner or outer gestures) to present and comprehend information (Finnegan, 2014). Through dialog, simulated situations and emotive performances, students apply both oral and non-verbal communication, which ultimately develops a sense of connection between them. This is compatible with communication theory, as it stresses the fact that both information and emotions are conveyed and that people gain mutual knowledge about each other (Mortensen, 2017). A fundamental factor in this connection between students and their peers in the theater is the reality that students must demonstrate their characters' emotions while also attentively responding to their peers, thus achieving a unified inter-drama group performance.

The foundational emphasis on teamwork and interconnectedness in drama pedagogy further cultivates students' mastery of the critical thinking processes. As students evaluate characters on the basis of their backgrounds, motivations and emotions, they become equipped with a skill called the evaluation and synthesis of information. When these students encounter plays, characters and contexts together, they explore interpersonal relationships and conduct brainstorming. Moreover, they develop their skills in a creative way and strengthen their understanding of the literary and cultural contexts. The theory of critical thinking brings about an end to the explanation of the mind as a tool for critical judgment, choosing and thinking in the higher order of animals (Miri et al., 2007). As an example, students participate in interpretative discussions during rehearsals; thus, they employ critical thinking to solve problems and hone their performances.

Imagination is the third significant skill acquired in drama lessons, encompassing improvisation activities. The act of imagining, novel scripting and character development is the foundation of creative thinking and originality. The theory of creative learning posits that unity of expression and creativity in producing a new storyline and character connects the two processes of thinking and learning, so students express individual differences and seek innovative solutions (Starko, 2021). Improvisational drills, which are also involved here, are other tools for the development of adaptiveness and on-the-fly thinking—the very building blocks of creative attitude.

Thus, drama education enhances cultural sensitivity because students are immersed in various historical and literary contexts from diverse cultures. Since they perform works from many cultures, students not only achieve an in-depth appreciation of how diverse the world can be but also respect its multicultural background. Cultural theory

reveals the role of education in building intercultural tolerance and friendliness (Vavrus, 2002). Children demonstrate empathy and widen their vision by acting as characters who belong to different backgrounds, which is crucial in today's deeply interconnected world.

Collaboration and communication are ranked highly among the skills taught in drama education, as they serve as the pillars for group performances and character representation. Research shows that these skills are the ones that expand students' cognitive and social competences and inspire their readiness to talk and play with each other (Ghavifekr, 2020), as well as strengthening their critical thinking (Miller et al., 2023). For example, students who join forces to make sense of a difficult text or work out a dispute arising from a show need both teamwork and analytical aptitudes to succeed. Through the process of exchanging thoughts, assigning roles and chatting, sustained interpersonal trust and peer relationships emerge, fostering collaborative learning. This integrative process thus helps students to either become more creative or to acquire cultural sensitivity or even social competency as they strive to produce art.

3. Methodology

3.1. Participants

The selected cohort for this study consisted of second-year university students majoring in English Education at a university in China. These students participated in a semester-long course on drama teaching. Among the 98 participants, 93 were female and 5 were male. Initially, all participating students completed a questionnaire. Subsequently, 15 students (13 female and 2 male) were selected for in-depth interviews to provide more profound insights.

The gender distribution in our sample (93 females, 5 males) reflects the actual enrollment patterns in this teacher education program, where female students significantly outnumber males. While this imbalance limited gender comparisons, we implemented two mitigation strategies: (1) ensuring diverse role representation (actors, directors, scriptwriters) and (2) deliberately including male participants in the qualitative interviews (2 of 15 interviewees). The gender imbalance (93 females, 5 males) reflects the actual enrollment in the course. We acknowledge that this limits the generalizability of the gender-related findings. However, we have attempted to mitigate this bias by including a wide range of participant roles and incorporating male voices where possible. We recommend that future studies use stratified sampling to better explore gender effects in balanced cohorts.

3.2. Study Reliability, Validity and Ethical Considerations

In this research, we established a set of rigorous procedures to ensure the reliability and validity of the research tools without compromising the anonymity of the participants or violating ethical principles. Participants' data were presented using pseudonyms and alphabetical codes that did not reveal any personal information.

Reliability and validity were upheld in both the questionnaire survey and the semi-structured interviews. The internal consistency of the questionnaire was assessed, yielding a Cronbach's alpha value of 0.85. Additionally, experts in drama education reviewed the lesson plan to ensure that it was appropriately designed to align with the core literacy framework. Similarly, the interview guide for the semi-structured interviews was systematically standardized, with the same set of questions administered to all participants. The guide was also reviewed by two drama education experts to ensure content validity.

Participants were fully informed of the study's aims and methodology, as well as their rights, including the option to withdraw at any time without consequences, before providing informed consent. Ethical approval was obtained from the relevant ethics review committee. All sensitive information gathered was treated with the utmost confidentiality,

and audio recordings were exclusively used for academic purposes. These recordings were scheduled for destruction following the conclusion of the research period.

3.3. Data Collection and Analysis Methods

In this study, a mixed-methods approach (Creswell, 1999) was adopted, combining quantitative and qualitative research methodologies to explore the impacts of collaboration and communication on students' critical thinking. The quantitative component examined broad dimensions, while the qualitative component provided deeper insights into the subject matter, achieving methodological triangulation and enhancing the trustworthiness and applicability of the results. The survey questionnaire provided a systematic means of collecting information from a large population, minimizing the biases often present in resource-intensive methods. In contrast, semi-structured interviews offered in-depth and flexible data, allowing the respondents to elaborate and ensuring the capture of broader qualitative aspects. This approach systematically captured the participants' lived experiences, offering an optimal methodology for the investigation of multifaceted educational processes.

This study utilized survey questionnaires and semi-structured interviews as the two primary instruments for quantitative and qualitative data collection, respectively. The survey questionnaire was based on a framework focusing on key skills such as collaboration, communication, critical thinking, creativity and cultural literacy. The questionnaire was distributed to a group of university students, and the data collection process was completed within a set timeframe. The semi-structured interviews were conducted with guidance from domain experts to ensure content validity. The interview items elicited information on students' experiences regarding teamwork, communication and critical thinking. A group of students also participated in online interviews, which were audio-recorded, fully transcribed and analyzed using thematic analysis to extract core ideas.

The quantitative survey data were analyzed using statistical software to produce descriptive statistics such as means, frequencies and standard deviations, followed by regression analysis to estimate the relationships among collaboration, communication and critical thinking. A thematic analysis captured students' opinions and cognitive development regarding the topics, contributing to the qualitative analysis derived from the interviews.

This study examined three core variables.

Collaboration was operationalized as joint task completion in drama activities (e.g., scriptwriting, rehearsals), measured through participants' self-reported engagement (Baker, 2015).

Communication encompassed verbal and non-verbal expression during role-play and feedback sessions, assessed via Finnegans (2014) framework.

Critical thinking referred to evaluative reasoning skills (e.g., analyzing character motivations), adapted from Miri et al. (2007).

These constructs aligned with the 5Cs framework (Wei et al., 2020) and were measured using a 5-point Likert scale (see Appendix A).

In addition to these core variables, this study employed a variety of background variables, including participants' job positions or roles. However, these were considered as supplementary factors to understand the participants' perspectives and were not central to the study's primary analysis. The interpretation of the results focused on the core variables of collaboration, communication and critical thinking.

For the qualitative segment of our study, we opted for the case study methodology (Stake, 1995). The case study method is ideal for the in-depth exploration of contemporary issues within a real-life setting (Stake, 1995). In this research project, the circumstances

of second-year students of English Education who were taking a semester-long course in drama were imagined as a bounded case. By examining one particular group within a particular educational setting, we were able to produce a detailed account of the critical thinking evolution of students through drama exercises. The case study design, in addition, permitted the utilization of multiple data sources—survey questionnaires and semi-structured interviews—thus enabling triangulation that resulted in the findings being more valid, in-depth and well understood within this unique context.

4. Questionnaire Results and Discussion

4.1. Results

Using age and gender as control variables, we constructed a regression model with critical thinking as the dependent variable and the interaction terms of collaboration and communication as the independent variables. The results of the regression model indicated that communication had a significant main effect on critical thinking, while collaboration had a positive and significant effect on critical thinking. Moreover, the interaction term of collaboration and communication was positively significant for critical thinking, thus confirming the existence of a conditioning effect.

This study further revealed that communication had a significant positive effect on critical thinking at collaboration levels between 0.5 and 1.0. In addition, collaboration positively influenced critical thinking at any level of communication.

The regression analysis (Table 1) revealed that collaboration significantly predicted students' critical thinking performance ($b = 0.436, p < 0.001$), indicating that students who worked more closely with others tended to develop stronger critical thinking skills. In contrast, communication alone was not a significant predictor ($b = 0.127, p = 0.315$), suggesting that exchanging ideas without deeper collaborative engagement may not be sufficient. However, the interaction between collaboration and communication was also statistically significant ($b = 0.236, p = 0.001$), which implies that the combination of these two elements had a synergistic effect, leading to greater gains in critical thinking than either factor alone.

Table 1. Results for critical thinking as dependent variable; R-sq = 0.526, $p < 0.001$.

	b	se	t	p
Constant	0.170	1.989	0.086	0.932
Communication	0.127	0.125	1.011	0.315
Collaboration	0.436	0.105	4.143	0.000
Communication x collaboration	0.236	0.068	3.451	0.001
Age	-0.004	0.096	-0.044	0.965
Gender	0.087	0.278	0.314	0.755
Conditional effects	b	se	LLCI	ULCI
Collaboration				
0.00	0.127	0.125	-0.122	0.376
0.50	0.245	0.116	0.015	0.474
1.50	0.480	0.125	0.232	0.729
Communication				
0.00	0.436	0.105	0.227	0.645
0.50	0.554	0.106	0.342	0.765
1.00	0.672	0.118	0.437	0.906

Beyond statistical significance, these findings have practical relevance. For instance, students working in teams consistently reported improved abilities to analyze character motivations and evaluate group strategies. This suggests that group-based drama projects

not only enhance their thinking depth but also transfer well to other academic and social contexts requiring analytical reasoning.

4.2. Regression Analysis of Collaboration, Communication and Critical Thinking in Drama Education

The regression coefficients reveal a strong positive relationship between collaboration, communication and critical thinking, taking into account the factors of age and gender. These findings align with recent discoveries and underscore the importance of working and communicating together in fostering critical thinking skills.

1. Main Effects

The analysis indicates that collaboration had a significant direct effect on critical thinking ($b = 0.436, p < 0.001$), while communication alone did not reach statistical significance ($b = 0.127, p = 0.315$). These results suggest that collaboration plays a pivotal role in fostering critical thinking, supporting the idea that teamwork enhances analytical and problem-solving skills.

Nikoi emphasized that collaborative efforts encourage diverse thinking and joint decision-making, enabling learners to tackle complex challenges more effectively (Nikoi, 2013). Barigai and Heravdakar further highlighted that collaboration creates dynamic learning environments, fostering a critical dialog and co-constructed understanding among participants (Barigai & Heravdakar, 2024).

Although the direct effect of communication on critical thinking was not statistically significant in isolation, its contribution becomes evident when viewed through a broader lens. Vygotsky's sociocultural theory (Pathan et al., 2018) posits that interaction is a crucial driver of cognitive development, suggesting that communication fosters the sharing of ideas and the refinement of thought processes. Syukri et al. (2024) also found that communication-rich environments significantly enhance students' critical thinking by providing opportunities to articulate and evaluate ideas.

2. Interaction Effects

As depicted in Figure 1, the interaction between collaboration and communication significantly amplifies critical thinking outcomes ($b = 0.236, p < 0.01$). At higher collaboration levels (1.5 SD), communication's effect on critical thinking intensifies by 92% compared to the baseline conditions (0.5 SD), underscoring their synergistic pedagogical relationship. These findings align with Vygotskian social constructivism, positing that collaborative environments cognitively scaffold communicative exchanges, thereby reciprocally enhancing individuals' higher-order analytical capacities (Pathan et al., 2018).

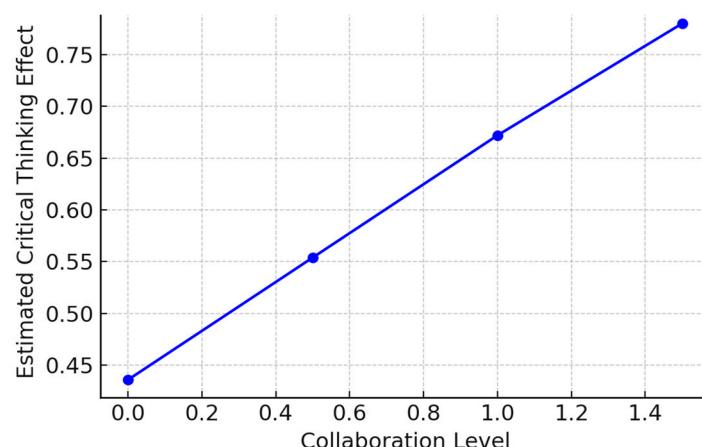


Figure 1. Interaction effect of collaboration and communication on critical thinking.

Forman and Cazden (2013) demonstrated that collaborative and communicative activities amplify cognitive benefits, supporting the notion that the integration of these factors promotes deeper analytical thinking. These findings suggest that theater-based teaching strategies should prioritize the simultaneous cultivation of collaboration and communication to optimize critical thinking development.

3. Conditional Effects

The conditional effects analysis further highlights the importance of the interaction between collaboration and communication. At medium to high levels of collaboration (0.5–1.0), communication demonstrated a significant positive impact on critical thinking, with increasing effects as the collaboration levels rose ($b = 0.245, p < 0.05$ at 0.5; $b = 0.480, p < 0.001$ at 1.5). Similarly, collaboration consistently contributed to critical thinking across all levels of communication, underscoring its universal importance.

Jeong (2001) emphasized that improvements in critical thinking are strongly influenced by group discussions, where communication plays a central role. In highly collaborative environments, communication facilitates deeper analysis, negotiation and problem solving. This interaction demonstrates the mutually reinforcing relationship between communication and collaboration, which is essential in cultivating critical thinking skills.

4. Synergistic Impact of Collaboration and Communication on Critical Thinking

The regression coefficients and interaction term illustrate the significant contributions of collaboration and communication to critical thinking. The positive and significant interaction term ($b = 0.236, p = 0.001$) reinforces the synergistic relationship between these two factors. These results align with Vygotsky's social constructivism theory, which emphasizes the role of social interaction and dialog in cognitive development (2018).

In drama education, collaboration and communication are vital mechanisms in fostering interaction, enabling students to construct knowledge through group activities and reflective dialog. As Syukri et al. (2024) demonstrated, communication promotes critical analysis by encouraging students to evaluate, articulate and refine their ideas. Similarly, Nikoi (2013) highlighted that collaborative efforts engage learners in joint problem solving and dynamic thinking, further enhancing critical thinking.

The results also suggest that, in drama education practices, collaboration creates fertile ground for communication, which in turn stimulates deeper critical thinking. For example, Jeong (2001) found that group discussions integrating both factors challenge students to articulate, defend and revise their perspectives, leading to more profound cognitive engagement. These findings provide theoretical and practical support for the incorporation of both collaboration and communication into theater-based pedagogical practices.

5. Conclusions

The findings confirm that collaboration and communication are mutually reinforcing in enhancing critical thinking, particularly in drama education. By leveraging their combined effects, educators can design activities that optimize students' abilities to analyze, negotiate and problem-solve. These insights offer a valuable framework for the integration of collaboration and communication into drama education, ensuring that students not only engage creatively but also develop essential critical thinking skills necessary for their personal and professional growth.

5. Interview Results and Discussion

5.1. Results

A thematic analysis (Table 2) of the interview transcripts, triangulated with classroom observations and artifact analysis (e.g., scripts and rehearsal footage), revealed three in-

terrelated themes that illuminate how drama education cultivates critical thinking among education majors.

Table 2. Thematic analysis of interview data.

Theme	Example Quote	Role	Gender	Observed Behavior Supporting Claim
Collaboration and Perspective Taking	"Helped me evaluate from multiple views."	Director	Female	Initiated alternative character readings and revised narrative to integrate peer input
Communication and Reflection	"Rehearsing with peers improved my clarity."	Actress	Female	Shifted from vague to specific expressions after peer dialog during rehearsals
Synergistic Learning	"We co-created and refined ideas."	Scriptwriter	Male	Jointly revised scenes through dialog, gestures and feedback during ensemble rehearsal

1. Collaborative Engagement Expands Cognitive Perspectives

Collaboration was identified as a fundamental mechanism through which participants developed cognitive flexibility and the capacity to interpret characters and narratives from diverse perspectives. Many participants reported that the process of co-constructing storylines in group settings exposed them to contrasting viewpoints and alternative interpretive frameworks, prompting them to reassess their initial assumptions.

Participant D, a scriptwriter, remarked,

"Working with teammates helped me see the character from different angles".
(Participant D, female)

This seemingly simple statement was substantiated by classroom observations. During one rehearsal session, Participant D posed a critical question regarding the significance of a character's prolonged silence—whether it signified emotional repression or subtly implied resistance to dominant social norms. Her inquiry instigated an extended group discussion on the character's psychological motivations and the sociocultural implications. This collaborative analysis subsequently led to substantial revisions in the script, particularly in the character's dialog and stage movements in the final scene.

A comparison between earlier and later drafts of the script revealed marked progression in D's interpretive depth—from surface-level reading to nuanced, inferential reasoning. Her capacity to formulate hypotheses, test alternative explanations and integrate peer feedback reflected essential components of critical thinking, particularly those related to analytical reasoning and perspective-taking.

2. Dialogic Interaction Fosters Reflective Thinking

Critical reflection was also cultivated through sustained verbal and embodied exchanges during rehearsals and feedback sessions. Participants emphasized that the iterative process of discussing, performing and revising enabled them to externalize tentative ideas, engage with peer perspectives and refine their reasoning in light of collaborative critique.

Participant K, responsible for designing the group's visual presentation, shared the following:

"Through rehearsing and discussing with others, I learned to express and refine my ideas". (Participant K, female)

This self-reported development was corroborated by observational data and artifact analysis. Early drafts of her presentation adhered to a linear narrative structure, with

minimal use of symbolic imagery. Over time, however, her slides evolved to include layered visual metaphors, contrasting color schemes and fragmented compositions intended to reflect emotional tension and thematic complexity. These changes—emerging through peer discussions and iterative revision—demonstrated her enhanced ability to engage in metacognitive processes, articulating abstract concepts through multimodal expression.

Participant K's evolving visual literacy and representational strategies exemplify how communication in drama settings supports reflective and evaluative thinking—core dimensions of critical thought. Initially, her slides followed a chronological sequence of events with minimal visual nuance. After multiple peer exchanges and rehearsals, she incorporated symbolic imagery—such as fractured mirrors to reflect character dissonance—and adjusted color schemes to mirror emotional intensities.

This transformation illustrates metacognitive growth: she not only thought about how to express her ideas clearly but also evaluated their emotional and narrative impacts. This reflects a hallmark of critical thinking: the capacity for self-monitoring, reflective adaptation and meaning-making through communicative acts.

3. Synergistic Learning Through Integration

Most notably, the participants highlighted that critical thinking emerged most powerfully when collaboration and communication were interwoven. Participant E, a director, captured this dynamic:

“By combining our efforts and discussing ideas, we found better ways to solve script issues”. (Participant E, female)

This synergy was vividly observed in a rehearsal addressing a plot inconsistency: the director questioned the emotional logic of a scene, the actors experimented with alternative gestures and blocking, and the scriptwriter revised lines on the spot. This iterative, dialogic problem-solving process showcased critical thinking not as a solitary reflection but as a co-constructed, embodied process.

It involved constant evaluation (“Does this gesture make the character’s reaction believable?”), peer feedback integration and adaptation to new information—a process akin to Socratic inquiry within a performative context. Such multimodal negotiation underscores how drama serves as both a medium and a method for deep, dialogic reasoning.

5.2. Interplay of Collaboration, Communication and Role Experience in Developing Critical Thinking and Core Literacies

5.2.1. How Collaboration and Communication Promote Critical Thinking

1. Teamwork as a Key Contributor to the Development of Critical Thinking

Collaborative activities—particularly group-based character analysis and script development—emerged as a crucial catalyst in fostering critical thinking. Interviewee F reflected on how joint rehearsals enabled them to explore alternative interpretations of the same character. Exposure to peers’ diverse emotional and behavioral enactments challenged their initial assumptions and encouraged deeper inquiry into the character’s underlying motivations. This process not only enriched their conceptual understanding of the internal character logic but also stimulated evaluative reasoning, a core component of critical thinking.

Respondents E and D similarly highlighted the intense discussions that occurred during script revisions, where they debated conflicting narrative pathways. These discussions involved constructive peer critique, the articulation and defense of personal viewpoints and the negotiation of a consensus—all of which necessitated higher-order thinking skills. As Respondent D stated,

"I had to thoughtfully explain the character's change in attitude. When naysayers couldn't convince me, I had to reevaluate my logic".

This dynamic peer engagement—requiring justification, counterargument and self-reflection—aligns with findings from prior studies on collaborative critical inquiry (Duffy, 2006; Çerkez et al., 2012).

2. Communication as a Driver of Critical Thinking

Communication, both verbal and non-verbal, played a significant role in enhancing the participants' abilities to articulate, interpret and reflect—central dimensions of critical thinking. Interviewee C described how embodying emotionally charged roles sharpened her sensitivity to nuances in tone, gesture and facial expression, deepening her understanding of subtext and intention. This attentiveness prompted her to reflect not only on what was being said but also on how and why it was communicated in particular ways.

Respondent K emphasized the importance of real-time responsiveness during performance, which demanded immediate critical judgments—particularly in interpreting emotional cues and maintaining coherence with the script. Meanwhile, Respondent N found value in the process of script analysis, which led them to pose probing questions such as the following:

"What makes the character quiet at this part of the script?"

"How does this moment change the whole story?"

These instances emphasize the importance of a reflective dialog (McNatt, 2019) and performance in building analytical (Rowland, 2002) and evaluative skills (Zhang et al., 2009).

3. Synergistic Effects of Collaboration and Communication

When collaboration and communication were integrated (Table 3), their synergistic effects on critical thinking became especially evident. Respondents O and M recounted their experiences of co-developing choreography for key scenes. This process required a collective discussion about the expressive meanings behind each movement, the emotional range of the narrative and how best to align gesture with dramatic intention. The act of synchronizing performance and interpretation not only deepened their understanding of the narrative but also exemplified critical thinking as a co-constructed, embodied and iterative process.

Participants G and I observed that creative collaboration often led to moments of "productive conflict", where disagreement sparked unexpected ideas. In these moments, clear communication helped to mediate tensions, and the group collectively determined which ideas were most effective for storytelling. The shared interpretive effort led to innovative resolutions, mirroring what Chinn and Clark (2013) describe as the cognitive benefits of high-interaction environments.

4. Quantitative and Qualitative Validation

The quantitative data support the qualitative findings: the regression analysis showed that both collaboration and communication significantly predict critical thinking, with a notable interaction effect ($b = 0.236, p = 0.001$). Conditional effect modeling further revealed that communication has a greater impact when collaboration is high—suggesting that communicative clarity enhances the critical engagement sparked by collaboration.

The qualitative data underscored this: when students worked closely together and exchanged feedback regularly, their thinking became more nuanced, reflective and multi-dimensional. Whether debating character motives or script structures, they consistently employed multiperspective reasoning, logic-based justification and evaluative reflection, validating the statistical trends observed.

5. Conclusions

The findings highlight that collaboration and communication not only support but also mutually reinforce critical thinking in drama education. Collaboration fosters exposure to diverse viewpoints and decision-making dynamics, while communication enables expression, questioning and interpretation. Together, they build a cognitive environment conducive to reflective analysis, problem solving and a critical dialog. Grounded in Vygotsky's social constructivist theory, these practices demonstrate how social interaction in performative contexts can scaffold students' development of higher-order thinking skills. Educators are thus encouraged to design drama activities that explicitly integrate collaborative and communicative elements to cultivate critical thinking in a structured yet creative way.

Table 3. Student roles and learning outcomes in drama course.

Student	Gender	Job	Experience and Feelings
A	M	Main actor	Emotional expression, character empathy.
B	F	PPT producer	Effective communication. Working closely with teammates allowed me to critically analyze how to best present ideas visually.
C	F	Main actress	Body language, facial expressions and voice convey emotions. Through team discussions, I refined my understanding of the script critically.
D	F	Scriptwriter	Co-creation of scenarios. Collaboration with the team helped me evaluate and improve the storyline effectively.
E	F	Director	Coordinated division of labor and joint problem solving. By leading group discussions, I critically evaluated others' ideas and proposed solutions.
F	M	Director	Unique understanding of characters and plots. Collaboration enabled me to view the story from multiple perspectives, sharpening my critical thinking.
G	F	Voice actor	Adding creative elements for individualized performances.
H	F	Main actress	Teaching drama offers a significant cognitive expansion in creative problem-solving.
I	F	Assistant director	Creativity develops through metacognitive engagement, experimenting and using your imagination.
J	F	Main actress	Self-confidence develops with continued practice and performance.
K	F	PPT producer	Identify and evaluate information, dare to express and present your views.
L	F	Supporting actress	Understand characters and think deeply about their motivations, emotional changes.
M	F	Supporting actress	Group collaboration helped me refine my interpretation of these emotions critically.
N	F	Prop maker	The increased depth of thought prompted me to focus on the details of the characters.
O	F	Choreographer	Team discussions allowed me to explore the nuances of the characters' actions critically.
			In character analysis and script reading, I learned how to ask insightful questions. Collaborative script reading enhanced my critical thinking about character development.
			Think about character behavior and plot development from multiple perspectives. Communicating with performers deepened my ability to critically evaluate choreography choices.

5.2.2. Gender Differences in Core Literacies

Due to the gender imbalance in the sample, the gender analysis in this study had limitations and should be interpreted with caution. The data reveal that female students excelled in activities involving role playing and emotional expression, such as playing leading or background roles and vocalizing. These skills are often linked to their strengths in collaboration and communication. Female participants demonstrated heightened aptitudes for emotional interpretation and collaborative performance, aligning with established gender-based behavioral patterns (Bear & Woolley, 2011). Ghiasi et al. (2015) observed similar trends in drama education, where female students demonstrated superior skills in collaboration, communication and emotional expression.

On the other hand, male participants exhibited a stronger orientation toward creativity and originality. Research suggests that males are more inclined toward originality and innovation in creative tasks (Proudfoot et al., 2015). The data also show that males are more likely to generate new ideas, add creative elements or offer unique interpretations of characters and plots, engaging in divergent thinking that fosters creativity.

This creative inclination is often linked to critical thinking. Lai (2011) argues that creativity and critical thinking are interconnected, as creative individuals tend to make novel connections and question established ideas. Therefore, male students may distinguish themselves in critical thinking by transforming existing ideas into new ones. Engaging in tasks such as character creation and storyline design can stimulate both creativity and critical thinking, helping students to explore diverse perspectives and problem-solving strategies. Fostering creativity through role-play and drama activities provides an ideal platform for the development of critical thinking. Ali suggests that creative expression in structured settings helps to refine both creative and critical thinking abilities (Ali, 2013).

However, it is important to note that these trends are not absolute stereotypes. Every student has unique behavioral patterns and learning styles. Educators should consider these individual differences when selecting teaching methods and strategies. To maximize each student's potential, educators can offer diversified learning tools, encourage cooperation and communication and provide personalized guidance and feedback.

5.2.3. How Role Experience Impacts Students' Backgrounds and Characteristics

Gender is not the sole factor influencing students' roles and experiences. Students' learning backgrounds and personality traits also play significant roles. For example, those tasked with producing PPTs may excel in communication, while screenwriters may demonstrate stronger creative and critical thinking abilities. Additionally, students' teamwork and communication skills are further influenced by their roles. Directors or assistant directors develop coordination and problem-solving skills, along with leadership experience in group initiatives and team projects (Mumford et al., 2000). Conversely, students in acting roles may focus more on emotional expression and communication—skills linked to prior theater or public speaking experiences (Borromeo, 2020).

Furthermore, these roles and experiences are closely tied to critical thinking development. Life experiences, such as the practice of character development and storyline design by playwrights or directors, influence how students approach problem solving and analytical thinking. Similarly, prop makers and choreographers, who focus on the finer details and plot presentation, bring unique perspectives to critical thinking. These differences reflect the varying academic and artistic demands placed on students, shaping their approaches to tasks (Mahama, 2024). Consequently, educators must design flexible curricula that cater to individual learning needs, promoting collaboration, communication and critical thinking to maximize students' contributions in group efforts.

6. Conclusions and Implications

This study focused on the process of communication and collaboration between teachers and students to influence core critical thinking abilities in drama education, thereby providing strong evidence in favor of the core literacy framework (5Cs). By analyzing how the principles of collaborative learning are interlinked with cognitive development, it is possible to verify the relevance of the theory and align it with socioeconomic theory, which demonstrates that social interaction and group-based activities play an essential role in the development of higher-order thinking skills, such as analysis, evaluation and synthesis. This contributes to a better understanding of drama education as a platform for the development of key 21st-century skills.

The findings also suggest that educators can gain practical insights when formulating drama-based syllabi. More specifically, students can enhance their teamwork, communication and critical thinking skills through group performances, role playing and joint scriptwriting. To develop high-quality learning experiences, teachers should consider the gender and job diversity among their students. Based on this observation, male students may benefit from exercises that require emotional expression, while female students may be given more challenging analytical tasks. Based on these insights, differentiated instructional methods can be designed to expand the scope and effectiveness of drama education programs.

As a result, the present research demonstrates that drama-based learning positively influences critical thinking, teamwork and communication skills. Educators should account for individual differences while implementing pedagogical innovations in the field of drama education to ensure that students develop essential skills for the future. These findings illuminate the theory of learning through drama and provide practical guidance for its application in educational systems worldwide.

7. Limitations and Directions for Future Research

Notwithstanding the many advantages of this study, there are several areas in which it fell short, and these should be acknowledged. To begin with, the participants of this study were selected from only one university program in China, which may limit the applicability of the results beyond other educational settings or cultural backgrounds. Moreover, although both male and female students were included in the sample, the latter were predominant because of the actual enrollment patterns, and this limited the potential analysis of differences between genders. Thirdly, thematic analysis assisted in the rich interpretation of the qualitative data, but the findings were still interpretative and could have been affected by researcher biases, although steps were taken to improve the trustworthiness of the study via method triangulation.

Future studies might widen the participant sample to incorporate several institutions and varying culture settings to further broaden the findings' generalizability. Moreover, longitudinal research could be designed to examine whether drama education can have a long-term impact on critical thinking. In addition, future research could adopt a gender-balanced sample to investigate how gender affects collaborative and communicative practices. Another potential area of investigation is the use of drama-based pedagogy combined with emerging technologies such as virtual reality to observe possible innovative approaches that are capable of fostering the process of critical thinking in a digital space.

Author Contributions: Conceptualization, Y.H. and J.S.; Methodology, Y.H.; Validation, Y.H.; Formal analysis, Y.H. and J.S.; Investigation, Y.H.; Resources, Y.H.; Data curation, Y.H.; Writing—original draft, Y.H.; Writing—review & editing, Y.H. and J.S.; Supervision, J.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of Foreign Language School at Wuhan City Polytechnic (1 September 2023).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data on which the study is based were accessed from a repository and are available for downloading through the following link: https://drive.google.com/drive/folders/1iCWOlaDjuWEb_Z_Oajqw0uwIWHRwoo?usp=sharing (accessed on 15 April 2025).

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

The following supporting information can be downloaded at: https://drive.google.com/drive/folders/11iCWOLAjDjuWEb_Z_OaJoqw0uwIWHrwoo?usp=sharing (accessed on 15 April 2025).

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