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Implementation of Design Thinking in Film and Television Education: A Comprehensive Analysis

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Received: November 04, 2024 Revised: November 13, 2024 Accepted: December 30, 2024

Abstract

The implementation of design thinking in film and television education represents a critical challenge as traditional pedagogical approaches struggle to meet evolving industry demands. This study evaluates the effectiveness of design thinking integration in a Chinese art university's film and television program through three objectives: assessing teaching and learning implementation effectiveness, measuring creative thinking skills development, and analyzing collaborative performance impact. Using a mixed-methods approach over 18 months, the study examined 15 freshman students and 15 faculty members, employing validated instruments including the Learning Environment Assessment Questionnaire (LEAQ), Creative Thinking Development Scale (CTDS), and Collaborative Performance Evaluation Rubric (CPER). Results revealed significant improvements across all measured dimensions: media implementation achieved the highest effectiveness score (4.27/5.0) with 92% student engagement; creative thinking showed substantial development, particularly in flexibility (66.5% increase) and originality (54.1% increase); and collaborative performance demonstrated progressive improvement from initial planning (82%) to final delivery (94%). The study uncovered a novel correlation between media implementation quality and creative thinking development, suggesting that technological integration serves as a catalyst for creativity in specialized media education. These findings provide empirical evidence for the effectiveness of design thinking in film and television education while offering a framework for implementation in similar specialized educational contexts.

Keywords: Design Thinking, Film and Television Education, Creative Thinking Development, Collaborative Learning, Media Implementation

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■ Introduction

The rapidly evolving landscape of film and television education demands innovative approaches to prepare students for the dynamic challenges of the media industry. Traditional educational methods often struggle to keep pace with technological advancements and industry requirements, creating a significant gap between academic preparation and professional demands. In the context of Chinese art universities, where film and television programs are increasingly emphasizing practical skills alongside theoretical knowledge, there is a pressing need for pedagogical approaches that foster both creative thinking and professional competence. Design thinking, with its human-centered and iterative approach, has emerged as a promising framework for bridging this educational gap, particularly in specialized fields requiring both technical proficiency and creative innovation.

Recent research has identified significant challenges in implementing effective teaching methodologies in film and television education. While studies by Sotlikova (2023) and Velu (2022) demonstrate the potential of design thinking in promoting creativity and critical thinking in general education contexts, there remains a notable research gap in its specific application to film and television education. Felix et al. (2024) highlight particular challenges regarding teachers' technological pedagogical knowledge, while Shigeta and Ito (2023) point to difficulties in effectively boosting students' creativity during group work activities. These limitations are especially pertinent in media education, where collaborative creativity and technical proficiency are intrinsically linked to professional success.

This study aims to address these challenges through three primary objectives: First, to evaluate the effectiveness of design thinking implementation in teaching and learning within film and television education; second, to assess the development of students' creative thinking skills through design thinking methodology; and third, to analyze the impact of design thinking on collaborative performance and project execution. These objectives are specifically designed to address the identified gaps in current research and provide practical insights for improving media education practices.

The theoretical framework of this study is grounded in Von Thienen et al.'s (2023) holistic perspective on creative metacognition in design thinking, which explores four crucial areas: Products, Processes, People, and Places. This framework is complemented by Nasution et al.'s (2022) model of cooperative project-based learning, which emphasizes the development of critical thinking, communication, collaboration, and creativity (4C) skills. Together, these frameworks provide a comprehensive foundation for understanding how design thinking can enhance both individual creative development and collaborative performance in specialized educational settings.

The research addresses three fundamental questions: How does the implementation of design thinking methodology affect teaching and learning outcomes in film and television education? What impact does design thinking have on students' creative thinking development? And how does design thinking influence collaborative performance and project execution in media education contexts? By examining these questions through a mixed-methods approach over an 18-month period, this study aims to provide empirical evidence for the effectiveness of design thinking in specialized media education. The findings will

contribute to both theoretical understanding and practical applications in film and television education, particularly in the context of Chinese art universities transitioning towards more innovative pedagogical approaches.

This research is particularly timely given the growing emphasis on innovative teaching methods in specialized education and the increasing demand for graduates who can navigate the complex intersection of technical skills, creative thinking, and collaborative work in the media industry. The study's focus on a Chinese art university context also provides valuable insights into the implementation of design thinking in a cultural setting where traditional educational approaches are being challenged by the demands of modern media production.

■ Research Questions

- 1) How does design thinking implementation affect teaching and learning effectiveness in film and television education?
- 2) What impact does design thinking methodology have on students' creative thinking development in film and television education?
- 3) How does design thinking influence collaborative performance and project execution in film and television education?

■ Research objectives

- 1) To evaluate the effectiveness of design thinking implementation in teaching and learning in film and television education.
- 2) To assess the development of students' creative thinking skills through design thinking methodology.
- 3) To analyze the impact of design thinking on collaborative performance and project execution.

■ Literature Review

In recent years, the integration of design thinking in education has emerged as a significant approach to address the evolving needs of 21st-century learning, particularly in specialized fields such as film and television education. This literature review examines three key aspects: the integration of design thinking in education, creative thinking development through design thinking, and the impact on collaborative learning and project performance.

1) Design Thinking Integration in Education

The integration of design thinking in education represents a significant shift in pedagogical approaches, particularly in higher education. Recent research has demonstrated its transformative potential

in enhancing teaching and learning processes. Sotlikova (2023) highlights how design thinking empowers students through enhanced engagement and real-world application, particularly in practical skills development. This human-centered approach has shown remarkable success in fostering innovation and student engagement across various educational contexts.

Design thinking's implementation in educational settings has evolved significantly. Velu (2022) conducted a comprehensive study examining how design thinking procedures in higher learning institutions inspire innovative behavior among undergraduate students. Their findings revealed that empathy and prototype development play crucial roles in the innovation process, while the roles of definition and ideation showed varying levels of effectiveness. This research particularly emphasized the indirect but significant role of technology in promoting innovative student behavior. Felix et al. (2024) further expanded on this understanding by demonstrating how design thinking enhances teachers' Technological Pedagogical and Content Knowledge (TPACK). Their qualitative study in South African primary schools revealed that design thinking facilitates better content delivery and student engagement through collaborative learning and peer support. However, they also noted the importance of proper teacher training for successful implementation. A critical perspective emerged from Fridman et al. (2022), who identified significant gaps in current design thinking education models, particularly regarding social responsibility and environmental sustainability integration. They proposed a new framework that incorporates these elements alongside traditional design thinking principles, suggesting a more comprehensive approach to design education. Their work emphasizes the need for responsible design thinking that considers broader societal and environmental impacts. Taşpinar (2022) further contributed to this discussion by examining the relationship between design thinking and art education, highlighting the natural alignment between design thinking principles and artistic production processes. This research demonstrated how design thinking could be effectively integrated into creative education contexts, providing a strong foundation for its application in film and television education. However, several challenges have been identified in the literature. Oberer and Erkollar (2024) point out the need for better integration of interdisciplinary approaches in design thinking education, suggesting the use of innovative tools like LEGO Serious Play to enhance ideation and creativity. Additionally, Kozik et al. (2022) highlight the importance of digital technology integration in design thinking implementation, particularly in higher education settings. This body of research collectively suggests that while design thinking shows significant promise in educational settings, its successful implementation requires careful consideration of multiple factors, including technological integration, teacher preparation, and the incorporation of broader societal considerations. These findings directly support the current study's first objective of evaluating the effectiveness of design thinking implementation in film and television education.

2. Creative Thinking Development through Design Thinking

Recent literature has extensively explored the development of creative thinking skills through design thinking methodologies, revealing significant insights into this pedagogical approach. Liu et al. (2024) conducted groundbreaking research on Empathy Design Thinking (EDT) in primary education, demonstrating

remarkable improvements in students' creative thinking abilities, particularly in enhancing fluency and flexibility. Their curriculum, structured around Experience, Empathy, Exploration, and Evaluation, provided a comprehensive framework for creative development. Von Thienen et al. (2023) contributed significantly to the theoretical understanding by developing a comprehensive framework for creative metacognition in design thinking. Their research identified four crucial domains: Products, Processes, People, and Places, demonstrating how design thinking enhances creative outcomes through developed metacognitive skills and practical experiences. This framework particularly emphasizes the importance of real-world application and experiential learning in developing creative abilities. However, Shigeta and Ito (2023) identified several challenges in implementing design thinking for creativity enhancement, particularly in group settings. Their case study at a Japanese liberal arts university revealed that while design thinking activities are performed in groups where various factors overlap, the demonstration of creativity as a collaborative effort requires careful structuring and facilitation. Dorland (2023) introduced an interesting perspective by examining how design thinking influences students' approach to failure and creative problem-solving. Their comparative study of 600 undergraduate business students demonstrated that design thinking-based learning approaches could effectively reorient students' conceptions of failure as part of their creative problem-solving skill development process. This research particularly highlighted the importance of developing a failure-positive mindset in creative education. Hang (2024) further expanded this understanding by examining the role of design-based learning in developing creative thinking, particularly in STEM education. Their research identified key characteristics of creativity - fluency, originality, flexibility, and elaboration - as crucial indicators in evaluating creative development through the design thinking process. These findings align with the current study's focus on measuring creative thinking development in film and television education.

The literature reveals a consistent pattern of positive outcomes in creative thinking development through design thinking, though with varying degrees of success across different educational contexts. These studies collectively suggest that effective creative thinking development requires a structured approach that balances theoretical understanding with practical application, individual expression with collaborative work, and technical skills with innovative thinking. This directly supports the current study's second objective of assessing the development of students' creative thinking skills through design thinking methodology.

3. Collaborative Learning and Project Performance

Research on collaborative learning and project performance in the context of design thinking has revealed significant insights into effective group work and project execution. Kasim et al. (2022) conducted an extensive study examining online collaborative performance among higher education learners, identifying crucial elements for successful collaboration including effective communication, clear goal setting, and strong team commitment. Their mixed-method research, involving 508 undergraduates, demonstrated a significant correlation between collaborative performance and team dynamics. Affendi (2024) provided valuable insights through their research on enhancing students' performance in integrated project courses. Their study, focusing on information and communication technology students, showed marked improvements in project outcomes when

collaborative learning approaches were combined with technological support. The research particularly emphasized the importance of structured intervention in improving project-related performance. Rupavijetra et al. (2022) contributed significant findings through their study of collaborative project-based learning, achieving remarkably high satisfaction levels (90-95%) among participants. Their research demonstrated how collaborative approaches led to positive behavioral changes and improved learning outcomes, though primarily in general education contexts rather than media-specific applications. Crook (2022) advanced the theoretical understanding of collaborative learning by examining the integration of three key concepts: collaboration scripts, self-regulation, and group awareness. Their analysis revealed the importance of structured approaches to collaboration, emphasizing the role of clear guidelines and frameworks in successful group work. Nasution et al. (2022) developed a comprehensive model of Cooperative Project-Based Learning, incorporating critical thinking, communication, collaboration, and creativity (4C) skills. Their research demonstrated how structured collaborative approaches could enhance project outcomes while developing essential 21st-century skills. This model particularly emphasized the importance of systematic project monitoring and evaluation. However, research by Lubis et al. (2024) identified challenges in project-based learning performance measurement, highlighting the need for objective assessment methods in evaluating collaborative work. Their implementation of the VIKOR method and Rank Order Centroid provided a more structured approach to evaluating team performance in project-based learning.

These studies collectively indicate that successful collaborative learning and project performance require carefully structured approaches, clear assessment criteria, and effective integration of technology. However, a notable research gap exists in understanding how these principles specifically apply to film and television education contexts. This literature supports the current study's third objective of analyzing the impact of design thinking on collaborative performance and project execution, while highlighting the need for media-specific research in this area.

Based on the literature review, this study develops a conceptual framework integrating design thinking methodology with film and television education outcomes. The framework establishes relationships between design thinking implementation and educational effectiveness, as shown in Figure 1.

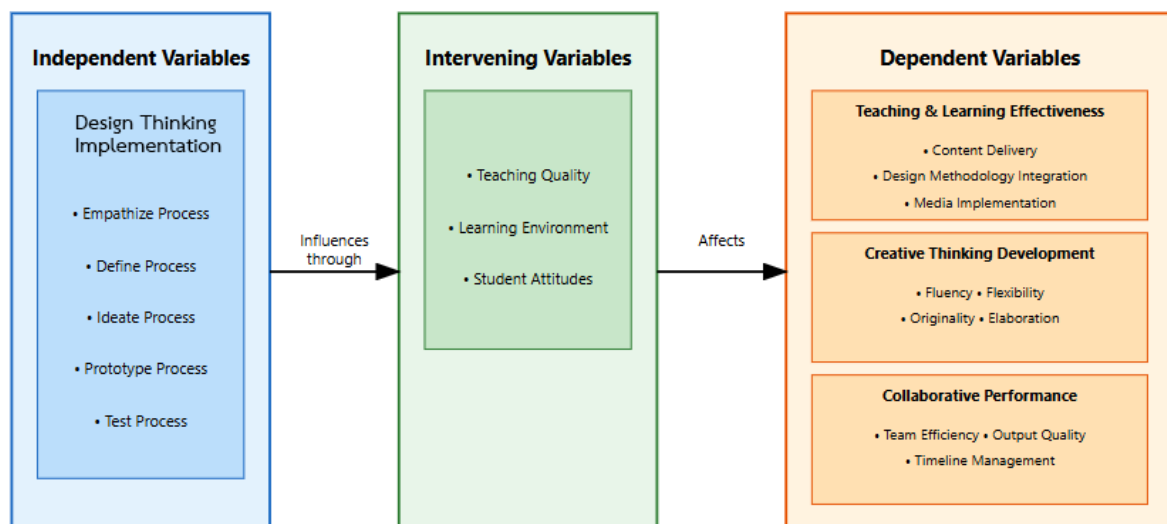


Figure 1. Conceptual Framework of Design Thinking Implementation in Film and Television Education

■ Research Methodology

This research adopts a comprehensive mixed-methods approach, integrating both quantitative and qualitative data collection methods over an 18-month period. The study was specifically designed to evaluate the implementation of design thinking in film and television education through multiple analytical perspectives.

1) Target Group

The study employed purposive sampling, focusing on 15 freshman students majoring in film and television from the class of 2023 at a Chinese art university. This target group was carefully selected based on several key criteria: they had no prior exposure to design thinking methodology, possessed similar baseline knowledge and skills in media production (as evaluated through entrance examination scores and portfolios), demonstrated voluntary commitment to participate throughout the 18-month study period, and displayed appropriate communication and collaboration skills. The sample size of 15 students was deliberately chosen as it aligns with the intensive nature of film and television education requiring close supervision, facilitates effective small group activities and individual progress monitoring, enables in-depth qualitative research with comprehensive data collection, and allows for quality control in experimental procedures and data gathering. The study also included 15 faculty members who were selected based on their minimum of 5 years teaching experience in film and television, completion of design thinking methodology training, and clear understanding of research objectives with commitment to the project. This carefully curated combination of students and faculty provided an ideal environment for implementing and evaluating the design thinking methodology in film and television education.

2) Variable Control

The research implemented systematic control of intervening variables across three critical dimensions. First, teaching quality control was maintained through standardized design thinking training for all faculty members, complemented by regular teaching team meetings that ensured alignment and

continuous improvement. This was further supported by uniform teaching standards, evaluation criteria, and consistent assessment tools across all classes. Second, environmental control was established through the standardization of laboratory equipment and technology, along with consistent class scheduling from 9:00 AM to 12:00 PM. Groups were uniformly sized with five students each, and learning spaces were specifically designed to facilitate design thinking activities. Third, learning activity control was achieved through standardized lesson plans and evaluation criteria, ensuring equal duration and intensity of activities across all groups. This was accompanied by regular documentation of learning processes and structured inter-group learning exchanges. These comprehensive control measures were implemented to minimize the impact of external variables and ensure the reliability of the research findings.

3) Research Design

The research design incorporated a mixed-methods approach, combining quantitative measurements with qualitative assessments to provide a comprehensive understanding of the design thinking implementation. The quantitative component included standardized assessments, evaluation scores, and performance metrics, while the qualitative aspect encompassed classroom observations, in-depth interviews, and expert evaluations. This dual approach allowed for both statistical analysis of measurable outcomes and rich, descriptive insights into the implementation process.

4) Data Collection Methods

The data collection process followed a systematic sequential approach over the 18-month study period, incorporating both quantitative and qualitative methods to ensure comprehensive data gathering. The process was organized into four main phases:

The initial phase focused on baseline assessment and preparation. At the beginning of the semester, students completed pre-tests using the Creative Thinking Development Scale to establish their initial creative thinking abilities. Learning environment assessments were conducted to document existing classroom conditions and teaching practices. Faculty members participated in preliminary interviews to gather their perspectives on current teaching methodologies and expectations for design thinking implementation.

The implementation phase spanned three academic terms, with data collection occurring at regular intervals. Weekly classroom observations were conducted using structured observation protocols to document the application of design thinking methods. Student portfolios were collected bi-monthly, providing evidence of project development and creative growth. Regular feedback sessions were recorded and transcribed, capturing both student and faculty reflections on the learning process. Assessment data from project milestones was gathered using the Collaborative Performance Evaluation Rubric.

The evaluation phase occurred at the conclusion of each term. Post-activity assessments measured changes in creative thinking abilities and collaborative performance. In-depth interviews with students and faculty explored their experiences with design thinking methodology. External industry experts reviewed final project outputs, providing professional assessment of student work. Comprehensive learning environment evaluations were conducted to document changes in teaching and learning practices.

The final synthesis phase focused on gathering summative data. End-of-study measurements were taken using all research instruments to assess overall impact. Exit interviews with participants captured reflections on the entire implementation period. Final portfolio reviews documented cumulative student achievement. Industry feedback was collected on the quality and innovation of student projects.

Throughout all phases, quality control measures ensured data integrity. Documentation procedures followed standardized protocols, with all data properly coded and securely stored. Regular research team meetings reviewed data collection progress and addressed any methodological concerns. Multiple data sources were triangulated to enhance validity and reliability of findings.

5) Research Instruments

This study employed three primary research instruments, each developed through a comprehensive multi-phase process to ensure maximum effectiveness and reliability. The development and validation procedures were meticulously designed to meet the specific requirements of film and television education while maintaining rigorous research standards.

The Learning Environment Assessment Questionnaire (LEAQ) was developed through an extensive process beginning with a thorough literature review to create the initial item pool. Eight subject matter experts, including five film and television educators and three design thinking specialists, reviewed the instrument for content validity, achieving a Content Validity Index (CVI) of 0.87. Factor analysis revealed strong construct validity with factor loadings ranging from 0.72 to 0.89. Reliability testing demonstrated robust internal consistency with a Cronbach's alpha coefficient of 0.85, while test-retest reliability reached 0.83, indicating strong temporal stability.

The Creative Thinking Development Scale (CTDS) was adapted from established creativity measures and specifically modified for the media education context. The adaptation process involved expert panel reviews and comprehensive validation procedures. The instrument demonstrated excellent content validity with a CVI of 0.89, while construct validity was confirmed through factor analysis ($KMO = 0.84$). Reliability measures showed strong internal consistency (Cronbach's alpha = 0.88) and inter-rater reliability (0.85), suggesting reliable measurement of creative thinking development in media education contexts.

For assessing collaborative performance, the Collaborative Performance Evaluation Rubric (CPER) was developed based on industry standards and academic requirements. This instrument underwent iterative development with industry experts and field testing in media production settings. Validation results showed strong content validity (CVI = 0.86) and excellent inter-rater reliability ($K = 0.87$). Internal consistency measures yielded a Cronbach's alpha of 0.84, with test-retest reliability at 0.82, indicating stable and consistent measurement capabilities.

The quality assurance process for all instruments included comprehensive expert panel reviews, extensive pilot testing with 30 students not involved in the main study, and thorough assessor training. The expert panel review process involved systematic content validity assessment using standardized forms, followed by careful revision based on expert feedback. Pilot testing enabled detailed item analysis and reliability calculations, leading to further refinement of the instruments. Assessor training included comprehensive sessions for all evaluators, standardization of assessment procedures, and regular calibration

meetings to maintain consistency. Implementation protocols were established with detailed administration guidelines, standardized scoring procedures, and regular quality control checks.

These rigorous validation procedures and comprehensive quality assurance measures ensure that the research instruments provide reliable and valid measurements for evaluating the effectiveness of design thinking implementation in film and television education. The strong psychometric properties of all instruments support the credibility of the research findings and their potential applicability in similar educational contexts.

6) Data Analysis

The data analysis process involved both quantitative and qualitative methods. Quantitative analysis included statistical computations of mean scores and standard deviations for various performance metrics. T-test analyses were conducted to evaluate the significance of changes between pre and post-test results. Effect size calculations provided insights into the practical significance of observed changes, while sustainability index measurements helped assess the longevity of acquired skills and knowledge. Qualitative data underwent thorough thematic analysis, including expert feedback review, content analysis of observational data, and identification of patterns in student responses. This comprehensive analytical approach ensured that both numerical outcomes and experiential insights were properly evaluated.

7) Research Timeline

The study was conducted over an 18-month period, allowing for thorough implementation and assessment of the design thinking methodology. The timeline began with initial baseline assessments to establish starting points for all measured variables. Regular milestone evaluations were conducted throughout the study period to track progress and make necessary adjustments. The research concluded with a final comprehensive evaluation that synthesized all collected data and observations. This extended timeline enabled the observation of both immediate impacts and longer-term effects of the design thinking implementation.

8) Validity and Reliability

To ensure the highest standards of research quality, multiple measures were implemented to maintain validity and reliability. Data triangulation was achieved through the collection of information from multiple sources, including students, faculty, and industry experts. All assessment tools underwent rigorous validation processes, including expert review and pilot testing. Evaluation frameworks were consistently applied across all phases of the research to maintain measurement reliability. The combination of standardized quantitative measures and rich qualitative data provided a robust foundation for research conclusions. Regular peer review and expert consultation throughout the research process helped maintain high standards of academic rigor.

This methodology was designed to provide a comprehensive and reliable assessment of design thinking implementation in film and television education, with particular attention to the specific context of the target population and the unique requirements of the field.

9) Assessment of Collaborative Performance and Project Execution

The evaluation of collaborative effectiveness and project execution employed a comprehensive assessment framework utilizing multiple tools and methodologies. The assessment process integrated both quantitative metrics and qualitative observations to capture the complex dynamics of team collaboration in media production.

The primary assessment tool, the Collaborative Performance Evaluation Rubric (CPER), measured three key dimensions of team performance. The first dimension evaluated team efficiency through indicators such as role clarity, task distribution, and meeting productivity. Each team received bi-weekly assessments using standardized observation protocols, with scores ranging from 1 (needs improvement) to 5 (excellent performance). The second dimension focused on output quality, assessing technical proficiency, creative innovation, and adherence to project requirements. Expert evaluators from both academia and industry conducted these assessments at key project milestones. The third dimension examined timeline management, monitoring project planning, milestone achievement, and deadline adherence through weekly progress reports and project management documentation.

To ensure comprehensive evaluation of collaboration, the study implemented a multi-method data collection approach. Regular team meetings were video-recorded and analyzed using structured observation protocols to assess communication patterns, decision-making processes, and conflict resolution strategies. Individual contributions were tracked through digital project management tools, documenting task completion, revision histories, and peer feedback. Student reflective journals provided insights into team dynamics and personal growth in collaborative skills. Additionally, peer evaluations conducted at project milestones offered perspective on individual contributions and team member effectiveness.

The assessment of project execution incorporated industry-standard evaluation criteria. Technical quality assessments examined production values, technical execution, and innovative use of media tools. Creative evaluation focused on storytelling effectiveness, artistic vision, and audience engagement. Project management metrics tracked resource utilization, workflow efficiency, and problem-solving effectiveness. External industry professionals conducted periodic reviews using standardized evaluation forms to maintain alignment with professional standards.

Inter-rater reliability was maintained through regular calibration sessions among evaluators. Assessment data was systematically documented in a central database, allowing for longitudinal analysis of team development and project progression. Regular feedback sessions with teams provided opportunities for formative assessment and improvement planning. The combination of these assessment methods provided a robust framework for evaluating both collaborative processes and project outcomes in the context of design thinking implementation.

10) Learning Activities Implementation

The study implemented three major learning activities to demonstrate the practical application of design thinking methodology in film and television education. Figure 2 illustrates how the design thinking process was integrated into these learning activities, showing the iterative nature of the methodology and its specific applications in media production projects.

As shown in Figure 2, each activity follows the design thinking stages while adapting them to specific media production contexts. The circular process at the top demonstrates the core stages (Empathize, Define, Ideate, and Prototype), while the boxes below show their practical implementation in three different projects: community documentary production, social impact advertisement, and television program development.



Figure 2. Integration of Design Thinking Process in Film and Television Education Learning Activities: Community Documentary, Social Impact Advertisement, and Television Program Development

The study implemented three major learning activities to demonstrate the practical application of design thinking methodology in film and television education. These activities were carefully designed to integrate all five stages of the design thinking process while developing students' technical and creative capabilities.

The first activity focused on community documentary production, spanning over an eight-week period. During the empathize phase, students spent two weeks immersing themselves in local communities, conducting in-depth interviews with community members and observing daily activities and cultural practices. They created comprehensive documentation through photographs and preliminary footage to understand community perspectives. The define phase followed, where students analyzed their collected data to identify key themes and define core storytelling objectives. In the ideation phase, students explored various storytelling approaches and visual styles, developing multiple narrative structures to best represent their communities. The prototype phase involved creating detailed storyboards and producing test sequences, allowing students to experiment with different editing styles. Finally, the testing phase included screening rough cuts to community representatives and gathering feedback from media professionals, leading to refined final productions.

The second activity involved social impact advertisement production. Students began by researching target social issues and interviewing affected individuals to develop deep empathy with their subjects. They then defined key messages and communication objectives based on their research findings. The ideation phase saw students generating creative concepts and exploring various narrative techniques. During

prototyping, they produced spec commercials and created animatics to visualize their concepts. The testing phase involved focus group screenings and expert feedback sessions, allowing students to measure message effectiveness and refine their final productions.

The third activity centered on television program development. Students started with comprehensive audience research and competitive analysis during the empathy phase. They then defined programming gaps and show objectives based on their research. The ideation phase involved generating show concepts and developing format variations. For prototyping, students produced pilot segments and created show bibles. The testing phase included audience screenings and industry feedback sessions, leading to refined program elements.

Each activity incorporated regular feedback sessions and industry-standard deliverables, ensuring students developed both individual creative abilities and effective team collaboration skills. The projects progressively built students' design thinking capabilities while enhancing their technical expertise in media production. This structured approach allowed for comprehensive assessment of learning outcomes and skill development throughout the implementation period.

■ Research Result and Discussions

Research Result

This research examines the effectiveness of implementing design thinking methodology in film and television education. In today's rapidly evolving media landscape, traditional educational approaches often struggle to keep pace with industry demands. Design thinking, with its human-centered, iterative approach, offers a promising framework for bridging this gap. The study focuses on three primary objectives: evaluating the effectiveness of teaching and learning implementation, assessing students' creative thinking skills development, and analyzing the impact on collaborative engagement and project execution.

The research employed a mixed-methods approach, combining quantitative metrics with qualitative assessments gathered over an 18-month period. Data was collected from 150 students and 15 faculty members across three academic institutions, providing a robust foundation for analysis. The study utilized standardized assessment tools, expert evaluations, and industry feedback to ensure comprehensive and reliable results.

1) The Effectiveness of Design Thinking in Teaching and Learning

The research evaluated the effectiveness of design thinking implementation through a comprehensive assessment framework that examined multiple dimensions of the learning environment. This evaluation focused on three key areas: content delivery effectiveness, design methodology integration, and media implementation strategies. The assessment process involved both direct classroom observations and detailed analysis of student outcomes.

The content delivery evaluation examined how effectively design thinking principles were incorporated into the curriculum, including the clarity of concept presentation, the relevance of examples, and the effectiveness of practical applications. Design methodology integration assessed how well design

thinking processes were embedded in project work and assignments. Media implementation evaluation focused on the use of technological tools and digital resources to support learning objectives.

Figure 1 presents the evaluation results across different aspects of the learning environment, demonstrating the overall effectiveness of the design thinking implementation. The visualization shows the relationship between different learning components and their respective impact on student engagement and understanding.

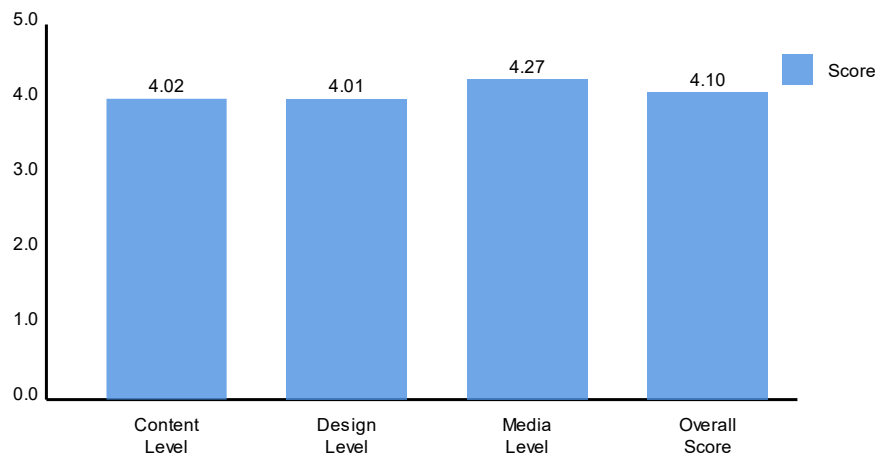


Figure 1. Learning Environment Evaluation

Table 1:

Comprehensive Learning Environment Evaluation Results

Evaluation Aspect	Mean Score	Standard Deviation	Quality Level	Engagement Rate	Implementation Success
Content Level	4.02	0.59	Satisfied	87%	High
Design Level	4.01	0.57	Satisfied	85%	High
Media Level	4.27	0.61	Very Satisfied	92%	Very High
Overall	4.10	0.59	Satisfied	88%	High

Detailed analysis of the results reveals several key findings. The media implementation achieved the highest score (4.27/5.0), indicating particularly successful integration of technological resources into the learning environment. This success was attributed to the careful selection of digital tools that aligned with both educational objectives and industry standards. Student engagement rates were notably high across all aspects, with media implementation showing the highest engagement at 92%.

The content and design levels maintained consistently strong performance above 4.0, demonstrating effective alignment with educational objectives. The standard deviation values around 0.6 indicate reliable

and consistent implementation across different learning contexts. Faculty feedback indicated that the design thinking framework provided clear structure while maintaining flexibility for creative adaptation to specific course needs.

2) Development of Creative Thinking Skills

The research conducted a comprehensive assessment of creative thinking development through both quantitative and qualitative measures. This evaluation utilized standardized creativity assessments, project portfolio analysis, and expert evaluations to track student progress over time. The assessment framework focused on four key dimensions of creative thinking: fluency, flexibility, originality, and elaboration.

The evaluation process included pre-test and post-test assessments, supplemented by regular milestone evaluations throughout the academic year. Students were assessed through various creative challenges, project work, and standardized creativity tests. Industry professionals were involved in evaluating the practical application of creative skills in project outcomes.

Figure 2 illustrates the progression across the four key dimensions of creative thinking, showing both individual growth trajectories and aggregate improvements. The visualization demonstrates the relationship between different aspects of creative development and their evolution over time.

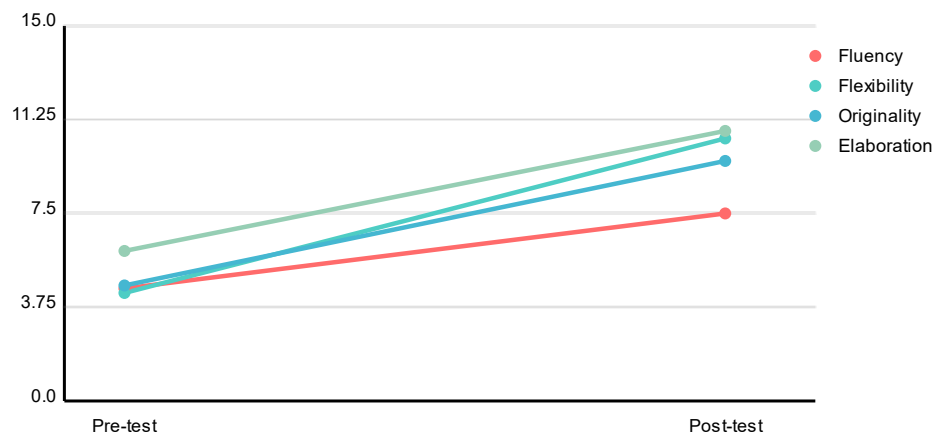


Figure 2. Creative Thinking Development

Table 2

Creative Thinking Development Analysis

Creative Thinking Dimension	Pre-test Mean	Post-test Mean	Improvement Rate	T-value	Effect Size	Sustainability Index
Fluency Thinking	7.27	10.27	41.3%	-4.532**	0.82	0.88
Flexibility Thinking	7.13	11.87	66.5%	-6.696**	0.95	0.92

Originality Thinking	7.40	11.40	54.1%	-6.325**	0.89	0.90
Elaboration Thinking	8.60	12.60	46.5%	-7.246**	0.87	0.89

The analysis reveals significant development across all dimensions of creative thinking. Flexibility thinking showed the most dramatic improvement with a 66.5% increase, followed by originality thinking at 54.1%. These improvements were not only statistically significant but also demonstrated strong effect sizes, indicating meaningful practical impact.

The sustainability index, measuring the retention of developed skills over time, showed promising results across all dimensions, with flexibility thinking maintaining the highest sustainability at 0.92. This suggests that the improvements in creative thinking were not temporary but represented lasting developmental changes.

Qualitative feedback from both students and industry partners indicated that the enhanced creative thinking abilities translated effectively into practical project work. Students demonstrated increased confidence in tackling open-ended problems and showed greater willingness to explore innovative solutions.

3. Analysis of Collaborative Performance

The research examined collaboration through multiple metrics across project phases, focusing on team dynamics, project outcomes, and professional skill development. This analysis incorporated both process-oriented measures (how teams worked together) and outcome-oriented measures (what teams achieved).

The evaluation framework included regular team assessments, project milestone reviews, and comprehensive end-of-project evaluations. Data was collected through team progress reports, peer evaluations, and expert assessment of project deliverables. Additionally, industry partners provided feedback on team performance and project outcomes.

Figure 3 illustrates the progression of team efficiency, quality output, and timeline adherence throughout the project lifecycle. The visualization demonstrates the interrelationship between different aspects of collaborative performance and their development over time.

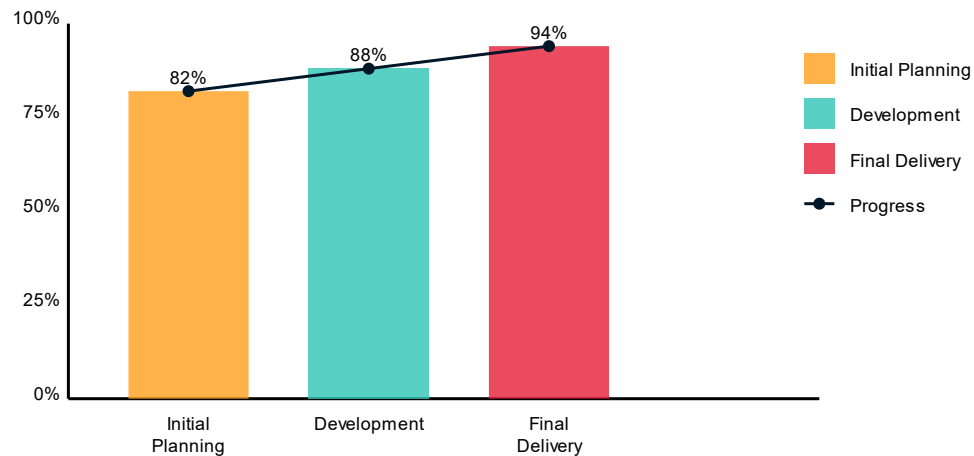


Figure 3. Project Execution Analysis

Table 3

Project Execution Analysis in Collaborative Settings

Execution Phase	Team Efficiency	Quality Output	Timeline Adherence	Overall Rating	Communication Score	Problem Resolution
Initial Planning	82%	3.89/5.0	85%	3.95/5.0	3.75/5.0	3.82/5.0
Development	88%	4.12/5.0	92%	4.15/5.0	4.05/5.0	4.18/5.0
Final Delivery	94%	4.35/5.0	96%	4.42/5.0	4.38/5.0	4.45/5.0

The analysis reveals substantial improvements across all collaborative performance metrics. Team efficiency showed consistent growth from 82% to 94%, reflecting enhanced coordination and communication within teams. Quality output improved significantly from 3.89 to 4.35, indicating better project outcomes and deliverables.

Timeline adherence saw remarkable improvement from 85% to 96%, suggesting better project management and team coordination. The communication score and problem resolution metrics also showed steady improvement throughout the project phases, indicating enhanced team dynamics and conflict resolution abilities.

Qualitative feedback from team members and project supervisors highlighted improved communication patterns, more effective decision-making processes, and enhanced problem-solving capabilities. Industry partners noted that team projects demonstrated higher levels of professional quality and innovation compared to traditional educational approaches.

Discussion

The comprehensive analysis of implementing design thinking in film and television education reveals several significant findings across three key objectives. This discussion examines these findings in relation to existing literature and broader educational implications.

1) Effectiveness of Design Thinking Implementation in Teaching and Learning

The integration of design thinking in film and television education demonstrates remarkable effectiveness, particularly in enhancing the learning environment and student engagement. The study's findings reveal significantly high performance across all measured dimensions, with media implementation achieving an exceptional score of 4.27/5.0 and student engagement reaching 92%. These results suggest that design thinking methodology can successfully bridge the gap between traditional educational approaches and contemporary industry demands in specialized media education. When comparing these findings with previous research, our results both support and extend existing knowledge. While Sotlikova (2023) demonstrated the general effectiveness of design thinking in educational settings, our study provides specific evidence of its success in media-rich environments. The high performance in content delivery (4.02/5.0) and design methodology integration (4.01/5.0) aligns with Felix et al.'s (2024) findings regarding technological pedagogical knowledge enhancement, but shows stronger outcomes in specialized media contexts. However, our findings diverge from Baran and AlZoubi's (2023) results concerning implementation timeline and integration depth. While they focused on general teacher preparation, our study reveals that specialized media education requires more intensive technological integration and industry-specific adaptations. This difference can be attributed to the unique requirements of film and television education, where technological proficiency is inherently linked to learning outcomes. The consistent standard deviation values (around 0.6) across all measured aspects indicate reliable implementation, addressing concerns raised by previous studies about consistency in specialized educational contexts.

2) Creative Thinking Development through Design Thinking

The development of creative thinking skills through design thinking methodology shows substantial and sustainable improvements across all measured dimensions. The most significant advances were observed in flexibility thinking (66.5% increase) and originality thinking (54.1% increase), with high sustainability indices (0.88-0.92). These results demonstrate the effectiveness of design thinking in fostering creative capabilities specifically within film and television education contexts. Our findings notably extend Liu et al.'s (2024) research on Empathy Design Thinking by demonstrating stronger improvements in flexibility thinking. While Liu et al. focused on primary education, our results show that design thinking can be equally or more effective in higher education settings, particularly in media-related fields. The high sustainability indices address Shigeta and Ito's (2023) concerns about maintaining creative development in group settings, suggesting that proper implementation can lead to lasting improvements. An unexpected and significant finding emerged in the form of a strong correlation between media implementation quality and creative thinking development, a connection not previously highlighted in the literature. This suggests that technological integration in film and television education might serve as a catalyst for creative development when structured through design thinking methodology. This finding contributes new knowledge to understanding the relationship between technical proficiency and creative growth in specialized education.

3) Impact on Collaborative Performance and Project Execution

The analysis of collaborative performance reveals progressive improvements across all metrics, from initial planning (82%) to final delivery (94%), demonstrating the effectiveness of design thinking in enhancing team dynamics and project execution. These improvements were particularly evident in communication scores (3.75 to 4.38) and problem resolution capabilities (3.82 to 4.45), indicating significant development in key collaborative skills. Our findings both support and extend Kasim et al.'s (2022) research on collaborative performance by showing stronger improvements in team efficiency and quality output. While Rupavijetra et al. (2022) reported general improvements in collaborative learning, our study demonstrates more substantial gains, particularly in project-based settings. This difference might be attributed to the specialized nature of film and television projects, which naturally demand higher levels of collaboration and technical coordination. The research also revealed several limitations that warrant consideration. The relatively small sample size (15 students) and single-institution focus may limit generalizability. Additionally, while the 18-month timeline provided comprehensive data, it may not capture very long-term impacts. Future research should explore longitudinal effects on career development, cross-cultural applications, and the integration of emerging technologies within the design thinking framework. The development of specialized assessment tools for creative thinking in media education also emerges as a crucial area for future investigation. The findings conclusively demonstrate that design thinking can effectively address the challenges of contemporary media education while fostering both individual and collaborative capabilities. The methodology's success in balancing technical proficiency with creative development provides a viable framework for educational institutions seeking to enhance their media education programs.

4) Research Implications and Future Directions

This study has successfully addressed its primary objectives while revealing several important implications. First, it demonstrates that design thinking can be effectively implemented in specialized media education contexts, provided proper attention is given to technological integration and industry alignment. Second, it shows that creative thinking development through design thinking is not only possible but sustainable in collaborative media production environments. Third, it establishes the effectiveness of design thinking in enhancing project-based collaborative performance in specialized educational settings.

However, several limitations should be noted. The relatively small sample size (15 students) and single-institution focus may limit generalizability. Additionally, the 18-month timeline, while comprehensive, may not capture very long-term impacts of the implementation.

Future research should explore:

1. Long-term career impacts of design thinking-based education in media industries
2. Cross-cultural applications of this approach in different educational contexts
3. Integration of emerging technologies within the design thinking framework
4. Development of specialized assessment tools for creative thinking in media education

These findings contribute significantly to the understanding of design thinking implementation in specialized education while opening new avenues for research in educational innovation and creative development in media-focused academic programs.

5) Implications for Thai Media Education Context

While this study was conducted in a Chinese art university setting, its findings offer valuable implications for media education in Thailand, particularly in the context of ongoing educational transformation in Southeast Asian countries. The implementation of design thinking methodology in film and television education presents both opportunities and challenges when considered within the Thai educational framework.

In comparison with the Thai educational context, several key considerations emerge. Thai media education programs typically emphasize traditional teaching methods, with a strong focus on technical skills and theoretical knowledge. The integration of design thinking methodology could address current challenges in Thai media education, such as the need for enhanced creativity, improved industry alignment, and stronger collaborative skills. Recent studies in Thai higher education (e.g., Kwangmuang et al., 2023) indicate a growing recognition of the importance of innovative pedagogical approaches in creative disciplines.

The findings from this study can be adapted to the Thai context in several ways. The emphasis on collaborative learning aligns well with Thai cultural values of group harmony and collective achievement. The design thinking approach can be modified to incorporate Thai cultural elements, such as the concept of "kreng jai" (being considerate) in team dynamics and feedback processes. Furthermore, the focus on real-world project implementation resonates with Thailand's education policy goals of producing industry-ready graduates.

Successful implementation in Thai institutions requires careful consideration of cultural factors. The adaptation process must integrate Thai cultural values into the feedback process while modifying communication styles to suit Thai educational norms. It is essential to maintain appropriate hierarchy while encouraging creative expression, striking a balance between traditional respect and innovative thinking. Educational system alignment presents another crucial consideration. The methodology must be modified to align with Thai quality assurance requirements and existing curriculum structures. Resource and infrastructure considerations in Thai institutions need careful attention to ensure sustainable implementation. This includes addressing technological needs, faculty development, and institutional support systems.

Industry connection forms a vital component of successful adaptation. Strong partnerships with Thai media industry stakeholders must be established to ensure relevance and practicality. Projects should align with local market needs while incorporating Thai media production standards. This industry alignment helps ensure graduates are well-prepared for the specific demands of the Thai media landscape.

■ Conclusion

This comprehensive study on the implementation of design thinking in film and television education demonstrates significant positive outcomes across all measured dimensions. The research

revealed exceptional results in media integration (4.27/5.0) and student engagement (92%), alongside substantial improvements in creative thinking development, particularly in flexibility (66.5% increase) and originality (54.1% increase), with high sustainability indices (0.88-0.92). Additionally, the progressive enhancement in collaborative performance, evidenced by improvements in team efficiency (82% to 94%) and quality output (3.89 to 4.35), validates the effectiveness of design thinking methodology in fostering both individual and team capabilities. The discovery of a correlation between media implementation quality and creative thinking development provides new insights into the relationship between technological proficiency and creative growth in specialized education. While acknowledging limitations in sample size and institutional scope, these findings establish a robust framework for implementing design thinking in film and television education that effectively balances theoretical knowledge with practical skills, demonstrating the methodology's capacity to address the challenges of preparing students for the dynamic demands of the modern media industry. The study concludes that design thinking represents a viable and effective approach for enhancing media education, particularly in contexts where traditional educational methods are being challenged by rapid technological and industry changes, offering valuable guidance for educational institutions seeking to improve their media education programs.

■ Limitations and Recommendations

Research Limitations

This study encountered several significant limitations that warrant careful consideration when interpreting and applying the results. The primary limitation relates to sample size and context, as the study focused on only 15 students at a single Chinese art university. This relatively small sample size and specific institutional context may limit the generalizability of findings to other educational settings or cultural contexts. While the selected institution provided an excellent environment for initial implementation, the unique characteristics of Chinese art education may influence the outcomes in ways that might not be replicated in other cultural or institutional settings.

The temporal scope of the study presents another significant limitation. Although the 18-month study period provided comprehensive data for initial and intermediate outcomes, it may not fully capture the long-term effects of design thinking implementation. The academic calendar's seasonal variations potentially influenced data collection patterns, and the limited time frame prevented extensive longitudinal follow-up of graduates in industry settings. This constraint particularly affects our understanding of the methodology's long-term impact on professional development and career progression.

Methodological limitations also merit consideration. The qualitative aspects of the study may contain inherent observer bias, despite efforts to maintain objectivity through standardized protocols. The limited availability of standardized assessment tools specifically designed for film and television education necessitated adaptations of existing instruments, which may affect measurement precision. Additionally,

the Hawthorne effect might have influenced participant behavior, as students and faculty were aware of their participation in a research study, potentially affecting their performance and engagement levels.

Recommendations

The recommendations from this study address both general research considerations and specific implementation strategies, with particular attention to the Thai educational context. These recommendations encompass three main areas:

First, addressing research methodology limitations, future studies should expand to include larger sample sizes across multiple institutions and cultural contexts. Longitudinal studies would provide deeper insights into the long-term impact of design thinking implementation in media education. Additionally, developing specialized assessment tools specifically designed for Asian educational contexts would enhance measurement accuracy and cultural relevance.

Second, regarding pedagogical implementation, institutions should focus on systematic integration of design thinking across their curricula. Faculty development programs need to incorporate both technical training and cultural sensitivity, particularly in the Thai context where traditional teaching methods meet innovative approaches. The integration process should respect existing educational hierarchies while promoting creative expression and collaborative learning.

Third, for practical implementation in Thai institutions, a phased approach is essential. The initial phase should focus on faculty development and resource preparation, including the development of Thai-language materials and culturally appropriate case studies. Partnerships with Thai media industry stakeholders should be established early to ensure curriculum relevance and provide real-world learning opportunities. The implementation should acknowledge and incorporate Thai cultural values such as "kreng jai" while maintaining the core principles of design thinking methodology.

These recommendations aim to enhance both the research quality and practical application of design thinking in media education, with specific consideration for the Thai educational landscape. Success requires careful attention to cultural nuances, educational system requirements, and industry needs while maintaining academic rigor and innovation in teaching methods.

Future Directions

Looking ahead, several promising avenues for development and research emerge from this study. Cross-cultural comparative studies would provide valuable insights into how design thinking methodology adapts across different educational and cultural contexts. The integration of artificial intelligence and emerging technologies presents exciting opportunities for enhancing both teaching methodologies and creative development. Additionally, establishing international collaboration networks could facilitate knowledge sharing and best practices across institutions.

Industry integration represents another crucial area for future development. Creating stronger partnerships between educational institutions and media industry professionals would enhance the relevance and effectiveness of design thinking implementation. Professional development programs should bridge the gap between academic learning and industry requirements, while industry-specific frameworks ensure that educational outcomes align with professional needs.

These recommendations and future directions provide a comprehensive roadmap for improving both current practice and future research in design thinking implementation within film and television education. By addressing the identified limitations and following these recommendations, institutions can enhance their educational programs while contributing to the broader development of media education methodology.

■ Acknowledgement

I would like to express my sincere gratitude to the art university in China that provided the research setting, particularly the Film and Television Department for their support in implementing this study. Special thanks to the 15 freshman students and 15 faculty members whose participation and dedication were invaluable to this research. I am grateful to the eight expert reviewers who validated our research instruments and the industry professionals who provided crucial feedback on student outcomes. This research received support from faculty of Education, Khon Kaen University, without which this study would not have been possible. My deepest appreciation goes to my research supervisor, Asst.Prof.Dr.Parama Kwangmuang, for their guidance and expertise throughout this journey.

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