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Practical Research on Project-Based Learning (PBL) in Film and Television Production in Xiamen Vocational Education

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Article History	Abstract
	The film and television industry plays a crucial role in the development of the global cultural sector. In recent years, vocational education in the field of film and television has experienced rapid growth in China. However, the current talent training model for this profession fails to meet the demands of the fast-paced industry development and lacks effective support for its advancement. Project-based learning is a student-centered teaching approach that employs authentic projects as the primary medium for learning. This study presents an empirical investigation conducted in a vocational college in Xiamen, where project-based learning was incorporated into the film and television production courses to assess its effectiveness. The findings of this research demonstrate that the implementation of project-based learning in the context of film and television production is viable. In comparison to traditional didactic instruction, project-based learning significantly enhances students' motivation to learn, practical skills, critical thinking abilities, and teamwork abilities. Consequently, it holds significant value in cultivating applied talents.

1. Introduction

The cultural industry, a sunrise sector in the 21st century, is the preferred choice for nations seeking to transform their economic development strategies. It serves as a crucial avenue to optimize industrial structures and a significant impetus for future economic growth [1]. The film and television industry, being an indispensable component of the cultural industry, has been garnering increasing attention in the context of economic globalization. The prominent role of the film and television industry in international competition is becoming increasingly evident, as major developed countries worldwide are actively devising strategies and fostering the growth of their domestic film and television sectors to harness them as a novel engine for economic growth [2].

With the rapid growth of China's socio-economic status, vocational education in the field of film and television has garnered unprecedented attention and expansion. According to statistics from the National Film Administration, China's annual film production in recent years has been as follows: 970 films in 2017, 1082 films in 2018, 1037 films in 2019, 650 films in 2020, 740 films in 2021, and 650 films in 2022. The total box office revenue for these years is as follows: RMB55.83 billion yuan in 2017, RMB60.7 billion yuan in 2018, RMB64.16 billion yuan in 2019, RMB20.42 billion yuan in 2020, RMB47.26 billion yuan in 2021, and RMB30.067 billion yuan in 2022. China is the second largest film market globally, with total box office revenue surpassing North America in the past two years. The pursuit of spiritual civilization and cultural life among our people has never been more ardent. Guided by the national innovation-driven development strategy, vocational colleges have further enhanced their personnel training and actively adapted to the emerging needs of national economic and industrial restructuring. Nonetheless, the training mode of film and television professionals has failed to keep pace with the rapid growth of the film and television industry, thereby struggling to effectively support and cater to the development of the sector. According to statistics, cultural and creative talents account

for a mere 0.1% of total employment in Shanghai. In comparison to other cultural capitals such as Tokyo (15%), London (14%), and New York (12%) [3,4], China is sorely lacking in talents dedicated to cultural and creative fields.

The inception of film and television education in China was witnessed in the early 1980s, when it started to gain traction in ordinary colleges and universities. As per incomplete statistics, approximately 250 such institutions currently offer film and television courses. At present, undergraduate education predominates China's film and television landscape, constituting the lion's share of the sector. The primary objective of this education is to cultivate well-rounded film and television professionals, equipped with fundamental knowledge, skills, and cultural sophistication. However, the current landscape is characterized by a surplus of theoretical talent and a dearth of applied talent, which serves as a bottleneck to the growth of Chinese film and television education. The constraints of traditional film colleges and universities in cultivating talent cannot satisfy the comprehensive needs of the market audience, resulting in a persistent shortage of industry professionals that has become a contemporary phenomenon [5]. In essence, while film and television theory research and knowledge system construction are being pursued, the implementation of practical education remains underdeveloped. Furthermore, the vocational education of film and television is still in its exploration phase [6].

In 2019, the Ministry of Education pointed out that it is necessary to implement the construction of courses that can cultivate innovative and multidisciplinary talents, which is specifically manifested in the integration of multiple disciplines, the integration of practices and theories, and the strengthening of interactive exchanges and cooperation between teachers and students, in order to reform and improve the teaching and learning process. The Ministry of Education highlighted that project-based learning and research-based learning can be employed to stimulate interest and motivation in learning. Diversified assessment methods are employed to deepen the learning experience and achieve the goal of authentic learning [7]. Thus, the application of project-based learning to reform the curriculum construction of film and television education aligns with the national education reform policy. Project-based learning has become an essential measure of curriculum reform and a specific path towards national curriculum reform.

Xiamen is a significant locale for the advancement of the film and television industry, having received considerable backing from the state in recent years with the objective of establishing an international film and television metropolis. On April 9, 2019, the China Film Association declared that the China Golden Rooster and Hundred Flowers Film Festival would be permanently situated in Xiamen, fostering the growth of the city's film and television sector. In April 2021, Xiamen University commemorated its 100th anniversary by announcing the establishment of a film school, followed by several vocational colleges founding film schools and film industry schools to cultivate talent for Xiamen's film and television industry. The Xiamen film and television industry is currently undergoing rapid development. In the context of the film and television industry's trend towards content quality, diversification, and specialization, applied film and television professionals are in critically short supply, struggling to keep pace with the accelerating pace of industrial growth.

In this study, students majoring in film and television production in a vocational college in Xiamen are selected as the research objects. This study is intended to cross the curriculum boundaries through project-based learning, promote the growth of students in cooperation, and promote the joint improvement of professional abilities of teachers and students, in order to provide certain references for the establishment of the training model for applied talents in film and television.

The rest of this paper is organized as follows: Section 2 provides the theoretical basis; Section 3 focuses on the application research of project-based learning in the field of film and television production; Section 4 presents the empirical results and provides an analysis of them; Section 5 is the discussion and conclusion.

2. Theoretical Basis

Definition of Project-Based Learning

Scholars from various countries have expounded on the meaning of "project-based learning" from diverse perspectives. The Buck Institute for Education in the United States defines project-based learning as the completion of a project that addresses real-world problems, with a focus on problem-solving [8]. Rudolf from the University of Munich, posits that project-based leaching can integrate theory into practical project execution, enabling students to actively and independently participate and acquire pertinent knowledge, skills, and social abilities [9]. International scholars generally concur that project-based learning represents an innovative and systematic learning or teaching approach.

Scholars in China studying project-based learning have also contributed to its definition. Liu Jingfu and Zhong Zhixian posit that project-based learning is an inquiry-based learning approach that initiates from subject concepts and principles, and relies on various resourceful methods to address relevant issues within a designated timeframe [10]. Gao Zhijun and Tao Yufeng suggest that project-based learning encapsulates the learning process where students employ surrounding resources for a specific project, internalize and innovate through practical exploration, ultimately mastering relevant knowledge and skills [11]. Xia Xuemei further refines this concept from the perspective of core literacy, proposing that project-based learning is a teaching method designed to foster students' core literacy by leveraging their own knowledge base and abilities to solve problems derived from either daily life or academic disciplines, thereby achieving desired learning outcomes [12]. Although domestic scholars may have varying perspectives on defining project-based learning, their interpretations of the concept's significance are largely consistent: students develop relevant abilities through exploration and problem-solving processes to achieve the desired educational outcomes.

Based on the concept and core elements of "project-based learning" discussed previously, this study defines project-based learning as a student-centric approach that emphasizes individual or collaborative exploration of complex, real-world, research-driven problems in authentic contexts, which values students' comprehensive utilization of various resources and tools to creatively address challenges and demonstrate their accomplishments.

Constructivism

The foundational theoretical underpinning of project-based learning is constructivism, which is a teaching philosophy with its roots in the cognitive development theories of influential Swiss psychologist, Jean Piaget. He posited that learning is a process where learners construct their understanding and generate meaning from new knowledge, based on their existing knowledge and experiences, highlighting the learner's subjective agency[13]. In accordance with constructivist theory, knowledge is acquired by learners through self-construction within specific social contexts, with assistance from others and the utilization of various learning resources. Consequently, teachers facilitating students' acquisition of knowledge should shift their role from mere knowledge transmitters to guiding and facilitating mentors, who assist students in organizing their knowledge and promote their cognitive development through experiential learning.

Application of Project-based Learning in Domestic and International Settings

The European Union nations initiated educational reforms in the 1980s, with vocational schools in numerous countries actively exploring the implementation of project-based learning in classrooms, which has yielded positive outcomes. The United States has consistently prioritized education and the cultivation of application-oriented talent. Its vocational education predominantly operates under a cooperative education model, wherein qualified workers are trained through collaborations with enterprises, service departments, and other external institutions. The integration of theoretical learning and practical operation is seamlessly executed in this method, enabling students to concurrently acquire theoretical knowledge and engage in practical operation. Currently, project-based learning is extensively employed in American primary, secondary, and university professional courses. Instructors mandate that students conduct small-scale project research in a team context, in conjunction with their courses, and disseminate their findings to others [15].The objective of German vocational education is to cultivate skilled frontline workers. Project-based teaching is extensively employed in this context, with the "dual system" serving as its fundamental modality. Students in this educational framework possess a dual identity, concurrently functioning as scholars in academia and apprentices in industry. These students allocate 30% of their academic time to receiving theoretical instruction, and upon obtaining their graduation credentials, they select an enterprise and devote 70% of their schedule to acquiring practical skills within the company. This vocational educational model has significantly contributed to the economic advancement of Germany [16].

The investigation of project-based learning in China is intimately connected to the advancement of vocational education. In 2001, Dr. Richard, a founding father of project-based learning from the United States, delivered a lecture on this topic in Beijing, advocating that project-based learning should be employed as the predominant instructional method in vocational education. This proposal garnered significant attention within the educational community. Policymakers at Dongcheng Vocational High School in Dongguan, Guangdong Province have implemented a teaching reform for computer major courses, focusing on four specialized subjects: "Computer Basics", "Flash5.0", "Network Design and Maintenance", and "VisualFoxPro6.0 Programming". This reform involves project-based learning experiments, yielding positive educational outcomes. Similarly, Hubei Vocational College has also

adopted project-based learning, establishing a distinctive web design course that significantly enhances teaching quality. Their project course "Web Making" has even been recognized as a provincial excellence course. In this approach, students initially gain hands-on experience at enterprises, learning about website design processes and project planning book production. Subsequently, they return to the academic setting to further their theoretical knowledge, combining work and study to achieve superior results.

Feasibility of Implementing Project-Based Learning in Film and Television Production Courses

The curriculum of film and television production courses is rooted in visual communication design theories and audiovisual principles. These courses aspire to foster students' proficiency in film editing equipment operation, editing techniques, and special effects production. Emphasis is placed on practical learning, aiming to cultivate not only students' technical skills but also their creative awareness. This is due to the increasing demands on film and television professionals, as people's aesthetic sensibilities and visual appreciation evolve. Traditional teaching methods possess certain limitations in fostering students' practical abilities, particularly in nurturing their innovative capabilities. Conversely, project-based learning accentuates the development of practical skills while concurrently focusing on cultivating innovation awareness and comprehensive qualities. Thus, project-based learning is a more suitable approach to fulfilling the educational requirements of film and television production courses.

Application Research of Project-based Learning in Film and Television Production Courses

For this project-based learning exercise, the chosen curriculum is film and television production courses. The target learners are students who enrolled in a vocational college in 2021 in Xiamen and are currently enrolled in the film and television production courses. To enable comparative analysis, two classes with identical levels taught by the same instructor were chosen as research subjects within the same grade. Each class comprises 50 students, with one class serving as the control class employing traditional teaching methods, while the other class functions as the experimental class utilizing the project-based learning approach.

Prior to initiating this educational exercise, a comprehensive survey was administered to evaluate the current teaching conditions and students' proficiency levels, with the objective of comprehending the existing educational landscape and student capabilities. Drawing upon the survey findings and considering the practical aspects of film and television production courses, a project-based learning curriculum framework was developed. Ultimately, a systematic analysis and evaluation mechanism was established to scrutinize the outcomes of this educational endeavor.

Survey on the Current Status of Film and Television Production Courses

In order to cultivate applied talents more effectively, educators should not only focus on students' academic performance, but also pay attention to their satisfaction with the educational environment and enhancing students' abilities across various domains. Consequently, this survey is divided into 2 sections: one examines the current teaching conditions of film and television production courses, while the other assesses students' comprehensive abilities. The survey initially employs a questionnaire method for statistical analysis. Drawing upon the results of the questionnaire survey, supplemented by interviews and on-site observations, this survey identifies the existing issues in the current teaching approach.

Survey Questionnaire Design

This survey was conducted in the form of a questionnaire, with the design of the questionnaire drawing inspiration from relevant studies by previous scholars. The Teaching Satisfaction Survey Questionnaire (refer to Appendix 1) consists of 6 dimensions: teaching methods, course content, student learning conditions, teaching resources, teaching evaluation, and suggestions for teaching reform, which is designed with 26 items, all of which are single-choice questions scored on a scale of 1 to 4. The Student Ability Survey Questionnaire (refer to Appendix 2) encompasses 8 dimensions: learning enthusiasm, self-directed learning ability, problem-identification ability, information acquisition ability, information processing ability, problem-solving ability, collaborative cooperation ability, and thinking skill, which contains 20 items, all of which are single-choice questions scored on a scale of 1 to 5.

Survey on Teaching Satisfaction

In this survey, a total of 100 questionnaires were distributed to the student population. Upon completion, all 100 questionnaires were collected without any exclusions. Subsequently, data from these one hundred questionnaires were analyzed and statistically processed. The questionnaire encompassed 26

questions, each with 4 possible options, assigned corresponding scores: 4 points, 3 points, 2 points, and 1 point. The sum of scores for each student in each dimension was calculated, and the data was subsequently categorized into two distinct groups: high score and low score. This categorization was implemented to facilitate a more intuitive analysis of the subject matter. For data processing and statistical analysis, SPSS and Excel software were employed.

The section assessing satisfaction with teaching methods encompasses 5 questions, all of which are scored positively. Ratings extending from 5 to 12 denote low satisfaction, while those ranging from 13 to 20 signify high satisfaction. According to statistical data, 68% of students express dissatisfaction with the current teaching methods, whereas 32% express satisfaction. The primary reasons for dissatisfaction include infrequent utilization of information technology in teaching, insufficient allocation of time for student reflection and consolidation during class, an inadequate structure in the teaching process, and teaching methods that inadequately align with the characteristics of the course materials and students' actual needs. This suggests that the overall satisfaction with the teaching methods in the film production courses is comparatively low. The existing teaching methods are overly simplistic, lack practical relevance, possess inadequate structure, and do not allocate sufficient time for stimulating learning motivation.

The section assessing satisfaction with course content encompasses 5 questions, wherein questions 6 and 9 are reverse-scored, while the others are positively scored. Scores ranging from 5 to 12 signify low satisfaction, and 13 to 20 denote high satisfaction. According to the data, merely 31% of students express a moderate level of satisfaction with the course content, whereas a significant 69% are dissatisfied. The primary reasons for this dissatisfaction include the perception of the courses' theoretical aspects as overly abstract and difficult to comprehend, the ineffectiveness of classroom cases in stimulating student motivation, the lack of coherence within the course content leading to forgetfulness, the dissonance between the content and future work requirements, and the absence of integration between theory and practice. Moreover, even after studying the material, students struggle with applying their knowledge to real-world problems. This indicates that there is a lack of interest, logic, and practicality in the course content.

In terms of the satisfaction with student learning conditions, 5 questions were crafted for this section, all of which are scored positively. Scores ranging from 5 to 12 signify low satisfaction, while scores ranging from 13 to 20 denote high satisfaction. According to the statistics, only 35% of students exhibit relatively high satisfaction with their learning, while the remaining 65% express low satisfaction. The factors contributing to this low satisfaction include students' inability to actively construct knowledge systems, infrequent engagement in critical thinking or knowledge expansion, passive participation in classroom discussions, and reluctance to collaborate with peers. This finding indicates that students continue to occupy a passive role in the classroom, exhibiting low levels of participation.

The section evaluating satisfaction with teaching resources comprises 3 questions, all of which are scored positively. Scores ranging from 3 to 7 denote low satisfaction, while scores ranging from 8 to 12 signify high satisfaction. According to statistical data, 67% of students express dissatisfaction with the available teaching resources, whereas 33% demonstrate relative satisfaction. The factors contributing to the low satisfaction levels include the persistent use of outdated textbooks, mismatches between learning content and future career requirements, and the lack of support for students in developing systematic knowledge structures and practical skills. This finding suggests that the current classroom teaching resources are both limited and outdated, posing challenges in their updating and hindering students' progress in knowledge acquisition and skill development.

The section assessing satisfaction with teaching evaluation is composed of 4 questions, all of which are scored positively. Scores ranging from 4 to 10 are considered low, while scores ranging from 11 to 16 are considered high. According to statistics, only 30% of students express relative satisfaction with the current teaching evaluation method, whereas a significant majority (70%) voice dissatisfaction. The primary reason for this dissatisfaction is the exclusive reliance on final assessments for evaluating students' competencies in film and television production courses, which does not provide a comprehensive assessment of their abilities. A majority of students perceive the proportion of theoretical knowledge and practical knowledge in the final assessment as unfair. This suggests that the current teaching evaluation method is overly narrow and does not align with the current focus of vocational education talent development.

The section on suggestions for teaching reform encompasses 4 questions, all of which are evaluated positively. Scores ranging from 4 to 10 denote the low-scoring group, while scores ranging from 11 to 16 indicate the high-scoring group. According to statistical analysis, 60% of students advocate the

implementation of project-based learning, while 40% do not fully comprehend its significance. The majority of students perceive project-based learning as viable and anticipate that this teaching approach will augment their personal interest and motivation. This finding suggests that students exhibit a high level of enthusiasm for implementing project-based learning and are predominantly willing to give it a trial.

Survey on Students' Abilities

In this survey, a total of 100 questionnaires were distributed among students, yielding a comprehensive dataset without any exclusions. Upon completion, all questionnaires were collected and subjected to data analysis and statistical processing. The questionnaire encompassed 20 questions, each with 5 possible options, assigned corresponding scores: 5 points, 4 points, 3 points, 2 points, and 1 point. The composite scores for each student were calculated based on their performance in various ability dimensions. Subsequently, these scores were dichotomized into two distinct groups - high score and low score - to facilitate a more intuitive analysis of the research issues. Lastly, SPSS and Excel software were employed for processing and analyzing the obtained data.

In terms of learning enthusiasm, 3 questions were designed, all of which were intended to elicit positive responses. Scores ranging from 3 to 9 signify low enthusiasm, while scores from 10 to 15 denote high enthusiasm. According to statistical analysis, only 13% of students exhibit high learning enthusiasm, with the remaining 87% displaying low enthusiasm. The primary factors contributing to low enthusiasm include a lack of interest in learning, low self-efficacy, and a suboptimal learning environment. These findings suggest that current teaching methods and content are insufficient to stimulate students' learning enthusiasm. Consequently, in the design of project-based learning, the project content should be derived from students' interests. The teaching process should provide frequent positive feedback on students' achievements to facilitate a sense of accomplishment and enhance self-efficacy. Moreover, teaching methods should emphasize teamwork and strive to improve the overall learning environment.

For the section examining self-directed learning ability, 3 questions were devised, all of which yield positive scores. Scores ranging from 3 to 9 are categorized into the low group, while scores between 10 and 15 are assigned to the high group. According to the findings, a significant majority of students (88%) exhibit lower levels of self-directed learning ability, with only a small percentage (12%) demonstrating higher levels. The primary reason for students' low autonomy is their inability to independently formulate and effectively execute learning plans during the learning process, coupled with their lack of self-monitoring and self-evaluation abilities. These results indicate that current teaching methods are inadequate in fostering self-directed learning ability, often over-relying on teachers while relegating students to passive roles. Therefore, in the design of project-based learning, it is imperative to prioritize students as active participants and facilitate their transition towards independent learning.

In the section examining students' problem-identification ability, 3 questions were devised. All 3 questions are scored positively, with scores of 3-9 indicating a low ability and scores of 10-15 indicating a high ability. According to statistical data, only 11% of students exhibit a high level of problem-identification abilities, while 89% demonstrate a low level. The reasons for students' deficiencies in problem-identification abilities are their decreased sensitivity, judgment skills, and ability to uncover the essential aspects of problems. This suggests that current teaching methods are inadequate in enhancing students' problem-identification abilities. Consequently, in the design of project-based learning, it is crucial to create project scenarios that stimulate students and establish discussion topics that pique their interest, exposing them to a variety of problems and fortifying their sensitivity and judgment skills towards such problems, as well as enhancing their capacity to unravel the core.

2 questions were crafted to evaluate students' information acquisition ability, both yielding positive scores. Scores ranging from 2 to 6 belong to the low-scoring subset, while those from 7 to 10 are categorized as high-scoring. Statistical analysis reveals that only 22% of students exhibit a high level of information acquisition ability, with the remaining 78% possessing a low level. The primary reason for the low information acquisition ability among students is their deficiency in initiating information gathering and retrieval. This finding suggests that current teaching strategies are inadequate in enhancing students' information acquisition ability. Consequently, project-based learning designs should incorporate student-independent filtering of project resource information to bolster their abilities in information gathering and retrieval.

Regarding students' information processing ability, 3 questions were devised, all of which were assigned positive scores. Scores ranging from 3 to 9 denote a group with lower capabilities, while scores ranging from 10 to 15 correspond to a group with higher capabilities. Based on the data, only 12% of

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students exhibit strong information processing abilities, whereas the remaining 88% demonstrate weaker abilities in this regard. The primary reason for students' lower information processing abilities is their insufficient proficiency in knowledge integration, construction, and application. This suggests that current teaching methods are inadequate in fostering students' information processing abilities. Consequently, in project-based learning designs, student autonomy should be prioritized by promoting independent thinking and facilitating the establishment of connections between existing and newly acquired knowledge. Under the mentorship of teachers, a systematic knowledge construction framework can be developed through practical applications, ultimately enhancing knowledge application.

In terms of evaluating students' problem-solving ability, 2 questions were devised, both of which were designed to elicit positive responses. Scores ranging from 2 to 6 were assigned to the low-scoring group, while scores from 7 to 10 were categorized as high-scoring. Statistical analysis revealed that only 15% of students demonstrated higher problem-solving abilities, with the remaining 85% exhibiting lower problem-solving abilities. The primary reason for the deficiency in students' problem-solving abilities was their inability to concretize problems effectively. This finding suggests that current teaching methods are inadequate in enhancing students' problem-solving abilities. Consequently, in the design of project-based learning, it is imperative for students to confront project tasks that are aligned with future practical work, thereby facilitating problem concretization. The project tasks assigned by teachers should incorporate interdisciplinary knowledge and be more conducive to enhancing students' comprehensive application skills and problem-concretization abilities.

In terms of students' collaborative cooperation ability, 3 questions were designed, all of which are scored positively. Scores ranging from 3 to 9 denote a group with lower collaborative cooperation abilities, while scores ranging from 10 to 15 indicate a group with higher collaborative cooperation abilities. According to statistics, 82% of students exhibit lower collaborative cooperation abilities, with only 18% demonstrating higher collaborative cooperation abilities. The primary factors contributing to students' lower collaborative cooperation abilities include deficiencies in communication with peers and instructors, a propensity to surrender when confronting challenges, and reluctance to seek assistance. These findings suggest that current teaching methodologies are insufficient in fostering students' collaborative cooperation abilities. Consequently, project-based learning designs should incorporate corresponding group collaboration activities. During these activities, students should exchange opinions and ideas, and work collaboratively through mutual support and division of labor to solve problems collectively. This approach will enhance students' communication skills and their capacity to seek help.

To assess students' thinking skill, 2 questions were formulated, both of which necessitate positive scoring. Scores ranging from 2 to 6 are categorized into the low-scoring group, while scores between 7 and 10 belong to the high-scoring group. Statistically, 89% of students exhibit lower thinking skill, with only 11% demonstrating higher thinking skill. The underlying reason for students' limited thinking skill is a dearth of strong logical and innovative thinking. This suggests that current teaching methodologies are inadequate for enhancing students' thinking skill. Consequently, in the design of project-based learning, a certain logical framework should guide students to comprehend these connections, thereby constructing a comprehensive knowledge system. Throughout the project completion process, students must execute tasks in stages, starting with simpler ones and progressing towards more complex ones. This systematic and rhythmic approach fosters their ability to consider effective project completion strategies while nurturing their logical thinking skill. Projects encompass experiential processes that necessitate multiple attempts to achieve optimal results. It is during this trial-and-error process that students are likely to generate new insights and develop divergent thinking skill as they cultivate their innovative mindset.

Survey Conclusion

Drawing upon the survey questionnaire study mentioned above, a random selection of 20 students was conducted for in-depth interviews to further delve into the pertinent issues elicited by the survey questionnaire. Concurrently, a observation of the classroom performance of students from two classes was undertaken.

Through surveys, interviews, and observations, it has been determined that certain deficiencies exist in the teaching methods, course content, learning conditions, teaching resources, and teaching evaluation

of film and television production courses at this vocational college in Xiamen. The students' abilities in various aspects are found to be subpar. In the traditional instructional process, where knowledge is merely disseminated to students, they tend to follow the teacher's pace and collaborate with them throughout the entire teaching process. Consequently, the students' status as active learners is not adequately reflected, as the teacher assumes a leading role, while the students play supporting roles. Teachers demonstrate operational steps through traditional teaching methods, with students merely following along. While it appears that students have learned, they are unable to independently complete tasks without step-by-step instructions from textbooks. This traditional form of instruction leads to students merely imitating what they observe, without exploring or innovating on their own. As a result, their problem-solving and analytical abilities are found to be relatively weak, with practical training components for students being notably lacking. In conventional educational settings, it is frequently observed that students are asleep or engaged with their mobile devices rather than actively participating in the learning process. Through discussions with these students, the author found that their disinterest in film and television production courses was not due to a lack of appreciation for the subject matter, but rather, they found the lectures monotonous and the demonstrations uninspiring. They disapprove of the didactic teaching approach, where instructors dominate the classroom, hindering students from expressing their own viewpoints and opinions. The transmission of knowledge is unidirectional, with limited interaction between teachers and students. Consequently, students exhibit a lack of enthusiasm for learning, as well as limited opportunities for peer communication. The development of collaboration and teamwork skills is also neglected.

By examining the current state and existing challenges in the instruction of film and television production courses at this vocational college in Xiamen, the author identifies the limitations of conventional teaching methods. The incorporation of project-based learning can significantly address these issues. Project-based learning posits students as the primary focus, aligning meticulously with their inherent characteristics. The instructional content is novel, engaging, and eminently practical. It accentuates student autonomy and collaboration, with teachers acting as facilitators to supplement the learning process, thereby fostering a more stimulating and independent academic environment. In the face of practical work projects, students should independently analyze problems, identify issues, and collect and process pertinent information to solve problems. This fosters students' abilities in problem identification, information acquisition, information processing, and problem-solving. Under the guidance of educators and through teamwork, students are capable of addressing complex issues and enhancing outcomes, enabling them to comprehend the significance of interpersonal communication and collaboration, which bolsters their collaborative abilities. The teaching process adheres to a progressive philosophy, incorporating logically structured content designed to foster students' thinking skill.

Based on the aforementioned analysis, the author endeavors to implement project-based learning in the film and television production courses at this vocational college in Xiamen, with the objective of ameliorating the current teaching circumstances.

Principles and Steps for Applying Project-based Learning

Principles for Applying Project-Based Learning

Film and television production courses represent an interdisciplinary domain that fuses art and technology. Instructors should be mindful of students' multiple intelligences, proactively design scenarios, and strive to foster their practical skills and innovative spirits. The objective of these courses is to effectively facilitate practical teaching activities, enabling students to comprehend the pertinent theoretical knowledge of film and television production, master special effects production and audio-video post-production capabilities, cultivate their innovation awareness and exploration abilities, as well as enhance their aesthetic sensibilities and teamwork communication skills. Project-based learning should prioritize the student as the main subject. Teachers should compile pertinent data and integrate the educational curriculum to design project content that is directly linked to students' real-world experiences and aligns with the occupational requirements of industries and businesses. The implementation of project-based learning in film and television production courses must be predicated on the characteristics of vocational colleges and students, adhering to these four principles.

(1) Project-based learning should be student-centered. Project-based learning should prioritize students as the primary participants, effectively leveraging their proactive engagement and enthusiasm. The disdain for traditional teaching methods among students stems from the passive dissemination of knowledge from teachers, which generates substantial pressure through repetitive assessments, leading to student burnout and a decline in learning interest. Project-based learning enables students to

experience autonomy in their education, as they independently determine project execution plans, engage in inquiries, present outcomes, and reflect on evaluations. Teachers primarily function as mentors, offering guidance, support, and management assistance while posing timely questions related to the projects that stimulate further intellectual exploration for students. This approach facilitates the acquisition of increased knowledge and skills through project-based learning.

(2) Project-based learning should be centered around practical experience. Traditional methods merely focus on the dissemination of knowledge, requiring students to sit passively in classrooms and listen to lectures. Students often rely on rote memorization to comprehend information from textbooks, resulting in limited opportunities for hands-on practice and the development of practical skills. Genuine growth can only be achieved through action, practice, and engagement with the environment. The significance of project-based learning lies in its integration of practical experience into teaching, enabling students to acquire knowledge and skills through hands-on practice, thereby enhancing their overall abilities. Consequently, when designing project content, it is crucial to incorporate tasks that are highly applicable in real-life situations, embodying the principle of placing practice at the core.

(3) Project-based learning should emphasize collaborative learning. Cooperative consciousness imposes heightened demands on teaching, which is reflected in the interactions among teachers and students, and among students themselves during instructional activities. The success or failure of cooperation has a direct impact on the completion outcomes and influences the effectiveness of practical activities, underscoring the importance of teamwork skills. Project-based learning specifically cultivates students' capability to collaborate with others. Throughout the process of project determination and execution, team members must engage in comprehensive communication, negotiation, and collaboration within their groups, harnessing each member's strengths to ensure optimal project completion. Although cooperative learning occurs in group settings, it distinguishes itself from ordinary group learning. Group members are expected to fully leverage their intelligence and collaborate with others towards mutual success.

(4) Project-based learning should connect theory with practice. The defining feature of vocational education is its emphasis on the acquisition of professional skills rather than theoretical knowledge. In project-based learning, the selection of project content should mirror real-world job requirements to facilitate the application of current learning for future use. Throughout the entire project implementation process, teachers should exercise their guiding role towards students. They should comprehensively assess students' levels of engagement, teamwork, and problem-solving abilities during project execution.

Steps for Applying Project-based Learning

Project-based learning is an educational approach that fosters collaborative growth between educators and learners through the completion of projects. In the realm of vocational education, it is imperative to investigate the scientific and efficient application of project-based learning to enhance the effectiveness of film and television production courses. Drawing upon prior research, the author posit that the application of project-based learning should be divided into the following six steps: project design, plan formulation, collaborative inquiry, product creation, product presentation, and summary and evaluation.

(1) Project Design

The design of projects should be predicated upon teaching objectives and curriculum content, aligning with students' cognitive attributes to stimulate their enthusiasm for learning. The merits of the project should be contemplated, along with an assessment of students' capability to complete it. Additionally, adjustments should be made in accordance with the actual teaching environment. A well-conceived project originates from a comprehension of the industry. Only those projects compatible with socio-economic and industrial demands can outfit students with the knowledge and skills sought by society. Consequently, project design can revolve around the job responsibilities of different positions, opting for projects that facilitate the more efficient accomplishment of future occupational tasks. Furthermore, the school's skill training facilities should also be taken into account. Project design needs to correspond with the current status of hardware and software equipment at schools.

Project-based learning necessitates a foundation in real-world scenarios, encompassing suitable course resources that are not exclusive to theory but derived from practical experiences and actual production processes in enterprises or businesses. Upon conducting preliminary research on multiple companies, the author identified that a considerable proportion of graduates specializing in film and television production are engaged in multimedia-related technical roles, such as film and television, advertising,

layout design, and animation. From an employer's standpoint, there is an urgent demand for skilled professionals in multimedia production, photography/videography, digital video editing, and special effects creation among television stations, wedding planning companies, and advertising agencies. The author has meticulously identified the essential skills by analyzing the job responsibilities of diverse associated professions. These core skills are primarily categorized into three groups: a) Lens assembly, encompassing the assembly of fixed lenses and motion lenses; b) Special effects production, including 3D effects and composite effects; and c) Sound processing, such as audio effects and sound editing. After conducting a thorough assessment of both the enterprise requirements and students' cognitive abilities, this research has meticulously incorporated these essential skills into six distinct projects, as delineated in Table 3-1. These projects, characterized by their proximities to students' educational experience and daily routines, exhibit a high degree of practicality.

Table 3-1. Project Content

Number	Project Theme	Core Skills
1	Freshman Military Training	video editing, scene transitions, subtitle effects, video effects, sound processing
2	Teacher's Day	interview video recording, footage editing, transition effects, voiceover and music synchronization, subtitle design
3	School Sports Meeting	video shooting, image editing and composition, sound processing
4	National Day	Logo design, subtitle creation, text animation effects, material 3D layout, video editing and special effects
5	School Art Festival	video editing and composition, subtitle design, audio processing, and intro/outro production
6	Campus Microfilm	plot creation, script writing, scene and character design, storyboard design, scenery and camera techniques, editing and compositing

(2) Plan Formulation

The project plan constitutes a comprehensive, detailed strategy for teaching. Instructors facilitate students in devising individual project plans, derived from the overarching teaching plan. This includes tasking students with workload allocation, personnel function assignment, task decomposition time scheduling, and task coordination among team members. Feasibility plans are devised to ensure the unhindered progression of the project.

The content of this study revolves around the implementation of project-based learning in the film and television production courses. Project-based learning serves as a primary research method, complemented by traditional teaching approaches such as lectures, demonstrations, and integrated teaching techniques. This research involves collective lectures over a three-week period, focusing on the explanation of software applications like After Effects, Premiere, and Audition, followed by practical instruction employing project-based learning.

To enhance teaching effectiveness and achieve educational objectives, this study primarily employs a group teaching approach. This method takes into account individual differences among students and their personal preferences. Due to the fact that the teacher in charge of the experimental class has been teaching for two semesters and is familiar with the students, it was decided that the grouping process would be led by this teacher. During the grouping process, individual preferences of students were taken into consideration. Eventually, all 50 students in the experimental class were divided into 5 groups, each consisting of 10 members.

Throughout the project-based learning process, instructors facilitate students in devising individual project plans that align with the broader instructional blueprint. The procedural steps include: a. in accordance with the instructional schema, instructors initially assume the role of clients and delegate project assignments to each group, outlining explicit expectations for project outcomes; b. the group leaders are assigned the role of project managers to facilitate task allocation, and these project managers are responsible for elucidating the project's content and detailed production requirements to their respective team members; c. the project managers and team members from each group collaborate to meticulously analyze the project, establish the script and overall style, allocate specific tasks, and deliberate on the project plans and implementation strategies; d. project managers submit their project plans to the instructors who provide expert guidance, and the instructors revise the project plans iteratively based on requirements until satisfaction is achieved.

(3) Collaborative Inquiry

This section constitutes the core of project-based learning, where students assume the role of primary actors, drawing upon their existing knowledge and resources to investigate novel domains of knowledge and skills. Upon initiation of the project plan, each group member must delineate their respective roles and responsibilities and collaborate in a synchronized manner to accomplish the objectives of the project. Throughout this collaborative inquiry process, students' proficiency in independent learning and teamwork is consolidated. The guidance provided by teachers in this section is indispensable. They should offer timely support based on students' progress, emphasize salient aspects, analyze and address difficulties collaboratively with students, and propose actionable solutions for reference. This approach can aid underperforming students in circumventing pitfalls and ensure the seamless execution of projects.

(4) Product Creation

Students, assigned specific roles and implementation plans within their groups, employ their acquired knowledge and skills to undertake the production of their products. In film and television production courses, the typical format for presenting products is through short videos. Students individually undertake tasks such as cinematography, audio recording, video effects, and animation, in accordance with their assigned roles. Ultimately, group members integrate their individual contributions into a cohesive short video, and provide descriptions and presentations of their project products to demonstrate their learning outcomes in a project-based learning environment.

(5) Product Presentation

After completing the product, each team will submit a comprehensive report and present their product. The report can adopt various formats, such as written documents or multimedia presentations using slides. Initially, each group should conduct a self-assessment of their product and summarize the challenges faced and accomplishments achieved throughout the process. Subsequently, there will be a classroom exchange of products, where they can share the joys and experiences gained from the product-making process. Additionally, this exchange will help identify and address their shortcomings.

(6) Summary and Evaluation

For the specific design of the evaluation system for project-based learning, please refer to section 3.3.

3.3. Design of Teaching Evaluation System

Teaching evaluation, an integral and crucial aspect of the teaching process, refers to establishing scientific criteria derived from teaching objectives, which encompasses utilizing all effective methods to assess and quantify the process and outcomes of teaching activities in order to derive evaluative insights. Teaching evaluation performs diagnostic, motivational, and regulatory functions. By means of teaching evaluation, we can pinpoint issues within project-based learning, evaluate the effectiveness and shortcomings of this teaching method, and make necessary adjustments to achieve superior teaching outcomes.

In project-based learning, a comprehensive evaluation that encompasses both outcome assessment and process assessment is crucial. This study separates the teaching evaluation into 3 components: firstly, the evaluation of course assessment, which includes process evaluation and outcome evaluation; secondly, the evaluation of teaching satisfaction, which employs a questionnaire survey method to assess the improvement in teaching satisfaction, thereby comprehending the effectiveness of instructional application; thirdly, the evaluation of student ability, which utilizes a questionnaire survey method to evaluate the enhancement of students' diverse abilities.

Evaluation of Course Assessment

The course assessment is designed to evaluate students' academic performance upon completion of the course, encompassing both outcome assessment and process assessment. The assessment score for the film and television production courses is composed of 3 components: project participation, project outcomes, and knowledge assessment.

Project participation evaluates students' performance during project execution, including their level of engagement, contribution to the project, teamwork spirit, and innovation. This evaluation consists of peer evaluations from group members and assessments by teachers, accounting for 25% of the total score.

Project outcomes refer to the evaluation of project products by both peer groups and teachers, accounting for 25% of the total score. The evaluation criteria include content theme, character performance, filming techniques, overall quality of project, and presentation.

Knowledge assessment, comprising 50% of the total score, assesses students' understanding of fundamental knowledge in film and television production at the end of the semester through written exams conducted under closed-book conditions. This component evaluates students' mastery of the basic professional knowledge.

Evaluation of Teaching Satisfaction

Employing the questionnaire survey method, the evaluation of the teaching satisfaction is conducted. The same questionnaire that was previously used in the prior survey on teaching satisfaction (refer to Appendix 1) will be utilized. A comprehensive assessment of the improvements in teaching methods, course content, student learning conditions, teaching resources, and teaching evaluations is conducted to demonstrate the effectiveness of project-based learning when applied to film and television production courses.

Evaluation of Students' Abilities

This study employs the questionnaire survey method to evaluate the improvement of students' abilities. The identical questionnaire employed for the prior survey on students' abilities will be employed (refer to Appendix 2). By evaluating the improvements in students' learning enthusiasm, self-directed learning ability, problem-identification ability, information acquisition ability, information processing ability, problem-solving ability, collaborative cooperation ability, and thinking skill, a comprehensive assessment of students' ability enhancement will be conducted. This is intended to demonstrate the feasibility of implementing project-based leaching in film and television production courses.

Implementation and Evaluation of Project-Based Learning in Film and Television Production Courses

Implementation of Project-Based Learning in Film and Television Production Courses

The objective of this study is to integrate project-based learning into the film and television production curriculum, and to comparatively examine the efficacy of project-based learning versus traditional instruction methods in enhancing teaching outcomes, amplifying students' interest and motivation towards learning, boosting their academic performance in foundational film and television production knowledge, elevating the caliber of their film and television pieces, and fostering their overall abilities.

The target learners are students who enrolled in a vocational college in 2021 in Xiamen and are currently enrolled in the film and television production courses. For the purpose of comparative analysis, 2 classes with similar levels, taught by the same instructor within the same grade, were selected as the research objects. Each class comprises 50 students, with one class serving as the control class employing traditional teaching methods, while the other class functions as the experimental class utilizing the project-based learning approach. The instructional content and duration are identical for both classes.

Evaluation of Project-Based Learning in Film and Television Production Courses

After the end of the semester, a comprehensive evaluation of both control and experimental classes will be executed, encompassing course assessment, teaching satisfaction survey, and student ability survey. Combining sampling interviews and on-site observations, the ultimate teaching evaluation outcomes will then be derived.

Comparative Analysis of Course Assessment Score

At the end of the semester, a course assessment was conducted for both the control class and experimental class. The score for the experimental class's course assessment consists of 3 components: project participation score (25% weight), project outcomes score (25% weight), and knowledge assessment score (50% weight). In contrast, the course assessment score for the control class is derived from classroom performance score (25% weight), homework score (25% weight), and knowledge assessment score (50% weight). Data analysis was performed using the independent samples t-test method with SPSS 20.0 statistical software. The course assessment scores of both classes were depicted in Table 4-1. The average score for course assessment in the experimental class stands at 85.32 points, in contrast to 72.14 points for the control class.

Table 4-1. Statistical Analysis of Course Assessment Scores for Experimental and Control Classes

Class Category	Number of Students	Mean	Standard Deviation
Control Class	50	85.32	7.8535
Experimental Class	50	72.14	8.5146

An independent samples t-test was conducted on the course assessment scores of two classes, as detailed in Table 4-2. The significance level for Levene's test of homogeneity of variances (a type of variance equality test) reached 0.603, exceeding the threshold of 0.05. This indicates that the variances of the two sample groups are homogeneous. Additionally, the significance value for the t-value (two-tailed) was 0.001, falling below the criterion of 0.05. Therefore, a significant difference between the two groups is suggested.

The findings reveal a significant improvement in course assessment scores for classes employing project-based leaching, as compared to those utilizing traditional lecture-based methods. This indicates that the implementation of project-based leaching in film and television production courses significantly enhances students' motivation to learn and their level of professional knowledge.

Table 4-2. Independent Sample t-test Analysis of Course Assessment Scores

	Levene's Test for Homogeneity of Variances		Independent Samples t-test for Means	
	F	**Significance**	**t**	**Significance (2-tailed)**
Assuming Equal Variances	0.282	0.592	-3.382	0.001
Without Assuming Equal Variances			-3.382	0.001

Comparative Analysis of Improvement in Teaching Satisfaction

Prior to the implementation of the project-based learning approach, a comprehensive survey was administered to assess the current teaching conditions in both the experimental and control classes. This prior survey evaluated students' satisfaction with respect to teaching methods, course content, student learning conditions, teaching resources, and teaching evaluation. A post survey utilizing the identical questionnaire was distributed to both classes at the end of the semester. The prior survey was administered to both the experimental and control classes, with 50 questionnaires distributed to each class and 50 valid questionnaires collected from each class. Similarly, the post survey was administered to both the experimental and control classes, with 50 questionnaires distributed to each class and 50 valid questionnaires collected from each class.

Based on the classification of students into high- and low-scoring groups according to their teaching satisfaction scores, the proportions of students in the high-scoring group for each dimension are considered the statistical entities. The proportions of students scoring 13-20 points in teaching methods, course content, and student learning conditions are computed as indicators of satisfaction with these respective dimensions. The proportions of students scoring 8-12 points in teaching resources are computed as indicators of satisfaction with teaching resources. Similarly, the proportions of students scoring 11-16 points in teaching evaluation are utilized to evaluate the satisfaction with teaching evaluation. By conducting a comparative analysis of the post survey results and prior survey results for both classes separately, an investigation into the improvements in teaching satisfaction can be conducted. The statistical outcomes are presented in Table 4-3.

Table 4-3. Statistical Analysis of Teaching Satisfaction Data

		Satisfied with Teaching Methods /%	Satisfied with Course Content /%	Satisfied with Student Learning Conditions /%	Satisfied with Teaching Resources /%	Satisfied with Teaching Evaluation /%
Prior Survey	Control Class	34	30	36	32	30
	Experimental Class	30	32	34	34	30

Post Survey	Control Class	34	32	38	32	30
	Experimental Class	56	54	58	44	50

According to Table 4-3, before the implementation of project-based learning, both classes exhibit comparable levels of satisfaction with respect to teaching methods, course content, student learning conditions, teaching resources, and teaching evaluation. Only a limited number of students from both classes' express satisfaction with the existing teaching circumstances. After the completion of project-based learning, there was minimal alteration in the teaching satisfaction for the control class, whereas a notable improvement was observed in the experimental class's teaching satisfaction.

Regarding teaching methods satisfaction, 30% of students in the experimental class expressed satisfaction prior to implementation, which increased to 56% post-implementation. This represents a 26% improvement compared to the control class, where satisfaction levels remained consistent before and after implementation. This significant enhancement can primarily be attributed to the project-based learning instructional model, which emphasizes student autonomy, reinforced by teacher guidance and collaborative efforts. This approach enhances students' learning experiences, leading to an increased satisfaction with teaching methods.

In terms of course content, a significant improvement of 22% was observed in the experimental class, with 32% of students expressing satisfaction with the course content prior to implementation, which increased to 54% post-implementation. In contrast, the control class experienced a minimal 2% increase. This substantial enhancement can primarily be attributed to the implementation of project-based learning, which bolstered the interest, logic, and practicality of the course content. By centering on real-life project tasks and guiding students to comprehensively apply their knowledge and skills, this approach enhanced students' overall knowledge and abilities while concurrently improving the practicality of the course content.

In terms of student learning conditions, the experimental class demonstrated a significant improvement, recording a 24% increase from 34% to 58% following the implementation of project-based learning. In contrast, the control class experienced a minimal 2% increase. This is attributed to the centrality of students in project-based learning, enabling them to directly engage in practical activities. Consequently, students developed a strong sense of ownership, resulting in their active participation throughout the learning process, and an enhanced level of satisfaction.

In terms of satisfaction with teaching resources, the experimental class demonstrated a significant improvement, with 34% of students expressing satisfaction with the teaching resources prior to implementation, which increased to 44% post-implementation. This represents a 10% enhancement compared to the control class, which showed no change in satisfaction levels before and after the intervention. This improvement can be attributed to the implementation of project-based learning, which fosters students' abilities for active learning. This approach enables them to independently acquire the necessary knowledge and skills required to complete projects through various channels, rather than being confined to passively receiving teaching resources provided by the school.

In terms of teaching evaluation satisfaction, 30% of students in the experimental class demonstrated satisfaction with the teaching evaluation prior to implementation, which increased to 50% post-implementation. This represents a 20% improvement compared to the control class, which showed no change in satisfaction before or after implementation. This outcome can be attributed to the implementation of a project-based learning model that employs diverse evaluation methods, emphasizing the development of students' overall abilities and respect for individual growth, rather than solely focusing on final grades.

These findings collectively demonstrate that implementing project-based learning in film and television production courses yields more pronounced benefits in addressing issues related to teaching methods, course content, student learning conditions, teaching resources, and teaching evaluation than traditional didactic approaches.

Comparative Analysis of Improvement in Students' Abilities

Prior to the implementation of the project-based learning approach, a comprehensive survey was administered to assess the current students' various abilities in both the experimental and control classes. A post survey utilizing the identical questionnaire was distributed to both classes at the end of the semester. The prior survey was administered to both the experimental and control classes, with 50 questionnaires distributed to each class and 50 valid questionnaires collected from each class. Similarly,

the post survey was administered to both the experimental and control classes, with 50 questionnaires distributed to each class and 50 valid questionnaires collected from each class.

Based on the stratification of students into high- and low-scoring groups in each ability dimension according to their questionnaire scores, the proportion of students in the high-scoring group for each dimension will be employed as the statistical object. The statistical outcomes for learning enthusiasm, self-directed learning ability, problem-identification ability, and information processing ability will be derived from the proportion of students scoring between 10-15 points. Similarly, the statistical results for information acquisition ability, problem-solving ability, collaborative cooperation ability, and thinking skill will be based on the proportion of students scoring between 7-10 points. A comparative analysis of student ability improvement will be completed by separately analyzing and comparing the post survey results for various aspects of abilities in both classes with the prior survey results.

(1) Learning Enthusiasm, Self-Directed Learning Ability, Collaborative Cooperation Ability, and Thinking Skill

A statistical analysis was performed to examine the changes in students' learning enthusiasm, self-directed learning ability, collaborative cooperation ability, and thinking skill in the experimental class and control class before and after the implementation of the project-based learning. The results of the statistical analysis are presented in Table 4-4.

Table 4-4. Statistics on Learning Enthusiasm, Self-Directed Learning Ability, Collaborative Cooperation Ability, and Thinking Skill

		High Learning Enthusiasm /%	High Self-Directed Learning Ability /%	High Collaborative Cooperation Ability /%	High Thinking Skill /%
Prior Survey	Control Class	12	14	20	12
	Experimental Class	14	10	16	10
Post Survey	Control Class	12	14	20	14
	Experimental Class	44	42	50	38

As depicted in Table 4-4, a pre-implementation analysis reveals that the students in both classes exhibit similar levels of learning enthusiasm, self-directed learning ability, collaborative cooperation ability, and thinking skill. Post-project-based learning, minimal changes were observed in the aforementioned learning abilities within the control class. Conversely, significant enhancements were noted in these learning abilities within the experimental class.

In terms of the learning enthusiasm, no significant improvement was observed in the control class before and after the teaching practice, whereas a 30% increase was detected in the experimental class. The enhancement of the learning enthusiasm can primarily be attributed to project-based learning, which modularizes knowledge points and provides novel classroom content closely related to real-life work situations. By creating authentic practical scenarios, this approach cultivates students' vocational abilities. Project-based learning enables students to actively participate in practical activities both online and offline, fostering a strong sense of agency during teaching activities as they engage in the entire learning process. Consequently, their motivation for learning is significantly ignited.

For the self-directed learning ability, a considerable enhancement in the development and execution of learning plans has been observed in the experimental class. This progress is reflected in the percentage increase from 10% to 42% in the pre- and post-teaching practice periods. The improvement can primarily be attributed to project-based learning that emphasizes student-centered approaches, fostering students' independent learning by encouraging critical thinking and problem-solving abilities. Furthermore, it promotes the development of individual study plans and their strict adherence. Throughout this process, self-monitoring and reflection are exercised, enabling students to accomplish the goal of independently addressing problems.

In terms of the collaborative cooperation ability, a significant improvement of 34% was observed in the experimental class, whereas no such enhancement was noted in the control class before and after the teaching practice. The enhancement of students' collaborative cooperation ability can primarily be attributed to the implementation of project-based learning, an instructional method that fosters group cooperation in completing project tasks. In this approach, students were organized into several small groups, requiring collaborative efforts to accomplish assigned project tasks. Throughout the project

execution, teachers provided timely guidance and assistance to help students overcome difficulties and challenges encountered. Under the project-based learning method, students not only gained more practical opportunities but also enhanced their communication and teamwork skills through frequent interactions with peers and teachers. They learned how to effectively allocate tasks among peers, efficiently utilize resources, and address various issues during project implementation.

In terms of the thinking skill, a significant improvement has been observed among those students in the experimental class who exhibit proficiency in critical thinking during the learning process. A 28% enhancement in their thinking skill was noted prior to and following the implementation of the project-based learning. This is attributed to the scientific principles of learning, which dictate that when students are exposed to familiar life or social situations and actively engage with them, their brains stimulate memories of past experiences associated with various objects. Subsequently, they link the newly acquired knowledge concepts with their existing understanding of those objects, facilitating long-term retention of the new information. This method is scientifically sound and effectively cultivates students' cognitive abilities. Regarding the development of the thinking skill, the project offers a process-oriented experience that necessitates a step-by-step approach throughout different stages. It requires comprehensive planning, smooth transitions between key points, and connections between different components. To successfully complete projects, students systematically and rhythmically consider how to access relevant information and efficiently execute tasks. Through multiple trial-and-error attempts during practical application processes, they progressively become aware of adjusting their own cognitive patterns.

These findings collectively demonstrate that, in comparison to conventional instructional approaches, the implementation of project-based learning in film and television production courses significantly enhances students' learning enthusiasm, self-directed learning ability, collaborative cooperation ability, and thinking skill.

(2) Problem-Identification Ability, Information Acquisition Ability, Information Processing Ability, and Problem-Solving Ability

A statistical analysis was performed to examine the changes in students' problem-identification ability, information acquisition ability, information processing ability, and problem-solving ability in the experimental class and control class before and after the implementation of the project-based learning. The results of the statistical analysis are presented in Table 4-5.

Table 4-5. Statistics on Problem-Identification Ability, Information Acquisition Ability, Information Processing Ability, and Problem-Solving Ability

		High Problem-Identification Ability /%	High Information Acquisition Ability /%	High Information Processing Ability /%	High Problem-Solving Ability /%
Prior Survey	Control Class	12	24	10	16
	Experimental Class	10	20	14	14
Post Survey	Control Class	12	24	12	20
	Experimental Class	44	42	40	52

According to Table 4-5, pre-project-based learning assessment reveals that the students in both classes exhibit similar levels of problem-identification ability, information acquisition ability, information processing ability, and problem-solving ability. Only a limited number of students from both classes frequently posed critical questions during the learning process, accessed pertinent learning resources based on the tasks at hand, and effectively leveraged these resources to resolve problems. Upon completion of project-based learning, minimal changes were observed in the aforementioned learning abilities for the control class; however, notable enhancements were noted in these abilities for the experimental class.

In terms of problem-identification ability, the control class's proportion remained stagnant at 12% both before and after the implementation of the project-based learning, indicating no improvement. In contrast, the experimental class's proportion surged from 10% pre-implementation to 44% post-implementation, showcasing a significant improvement of 34%. Regarding problem-solving ability, the control class experienced a modest increase from 16% to 20% post-implementation, amounting to a 4% improvement. Conversely, the experimental class demonstrated a notable escalation from 14% to 52% post-implementation, corresponding to a substantial improvement of 38%. Project-based learning is designed to integrate theoretical knowledge into practical problem-solving through modularization,

with the completion of projects serving as the ultimate goal. Students are encouraged to engage in hands-on activities that enhance their participation and stimulate their thought process. This approach fosters students' ability to employ various learning methods, enabling them to actively discover and effectively resolve problems. During teaching sessions, teachers employ a variety of scenarios and communication opportunities to demonstrate and guide students in mastering different combinations of learning methods, such as comparative analysis techniques, information retrieval strategies, verification procedures, and feedback mechanisms. These established methods not only enhance learning outcomes but also improve students' abilities to identify problems accurately and solve them effectively.

Regarding the information acquisition ability, the pre-implementation proportion in the control class stood at 24%, remaining unchanged at 24% post-implementation, indicating no improvement. In contrast, the experimental class demonstrated a significant increase from 20% to 42%, a rise of 22%. As for information processing ability, the pre-implementation proportion in the control class was 10%, marginally increasing to 12% post-implementation, suggesting a modest improvement of 2%. Conversely, the experimental class underwent a considerable enhancement from 14% to 40%, reflecting a notable increase of 26%. In project-based learning environments, students are required to actively seek knowledge and skills that contribute to project completion via multiple channels, rather than solely relying on teacher instruction. This fosters their ability to acquire information. Moreover, to effectively apply acquired information, students must filter and summarize it for further enhancement, thereby exercising their information processing skills.

The data presented above demonstrates a significant enhancement in students' capabilities, when employing project-based learning in film and television production courses, in terms of problem-identification, information acquisition, information processing, and problem-solving, as compared to traditional lecture-style teaching.

4. Conclusion
Summary of Practical Research

In this study, students majoring in film and television production in a vocational college in Xiamen are selected as the research objects. This study employs methodologies such as questionnaire surveys, interviews, and observations to compile an overview of the principal challenges within current teaching models. Drawing upon theories associated with project-based learning, this study redesigns the film and television production courses, establishes a new teaching evaluation system, and applies the redesigned curriculum content and newly established teaching evaluation system in teaching practice.

After conducting a thorough analysis of the outcomes of empirical research, it was found that project-based learning demonstrates a higher degree of effectiveness compared to conventional teaching methods. In film and television production courses, the implementation of project-based learning not only significantly improves students' satisfaction with teaching methods, course content, student learning conditions, teaching resources, and teaching evaluation, but also considerably enhances students' learning enthusiasm, self-directed learning ability, problem-identification ability, information acquisition ability, information processing ability, problem-solving ability, collaborative cooperation ability, and thinking skill.

Limitations of this Study

In light of the experience and expertise limitations, this study has also detected some shortcomings during the course of this empirical research, which can be addressed by improvements and expansion in the future.

Firstly, the design of the project and the evaluation criteria for project outcomes require further optimization. The objective of vocational education is to nurture applied talents; thus, the project content in project-based learning should directly correspond to job specifications and accurately mirror real-world work processes. In this specific project-based learning exercise, both the project design and the evaluation criteria for project outcomes are derived from the author's personal understanding of film and television production work land research on pertinent companies, which might lead to a disconnect from actual industry practices. If feasible, collaboration between educational institutions and enterprises could significantly enhance project design and elevate evaluation standards for project outcomes.

Secondarily, the current framework for group collaboration requires further refinement. Interviews and on-site observations reveal certain discrepancies within the group collaboration mechanism, such as an unfair or ambiguous distribution of tasks and instances of negative attitudes among students. This suggests a lack of real-time understanding by educators throughout the group collaborative inquiry process, as they only conduct evaluations after each project's completion. Consequently, the grouping

mechanism, task allocation within groups, and the evaluation system for group collaboration necessitate further optimization.

Discussion

This study demonstrates that project-based learning is a suitable approach for the film and television production courses in vocational colleges. Furthermore, through school-enterprise collaboration, the benefits of project-based learning can be amplified. Firstly, such collaboration facilitates the design of project content that is more aligned with actual work requirements. The project demands of frontline enterprises better represent the industry's development trends, and meeting these demands can enhance the effectiveness of students' relevant knowledge and skill development. Secondly, compared to schools, enterprises possess more advanced and professional software and hardware resources. Implementing school-enterprise collaboration can provide students with access to superior teaching resources. Lastly, through school-enterprise collaboration, students can directly communicate with employees from various positions in companies, gaining a more intuitive understanding of job responsibilities and working conditions. This facilitates students' identification of their interests in specific positions and enables targeted learning. In conclusion, this study posits that integrating school-enterprise collaboration into the project-based learning process merits further research.

References:

1. Hirsch, P. M. (1972). Processing Fads and Fashions: An Organization-Set Analysis of Cultural Industry Systems. *American Journal of Sociology*, 77(4), 639–659.
2. Manuel, P. (2019). Marxist Approaches to Music, Political Economy, and the Culture Industries : Ethnomusicological Perspectives. In *Theory for Ethnomusicology* (pp. 51–70).
3. DeWaard, A. (2020). Financialized Hollywood: Institutional Investment, Venture Capital, and Private Equity in the Film and Television Industry. *JCMS: Journal of Cinema and Media Studies*, 59(4), 54–84.
4. Newsinger, J., & Eikhof, D. R. (2020). Explicit and Implicit Diversity Policy in the UK Film and Television Industries. *Journal of British Cinema and Television*, 17(1), 47–69.
5. Liu Jun. (2017). The Pursuit of Excellence in the Multi-Screen Era: Reflections on talent Training in Chinese film Academies. *Contemporary Film* (02),4-8.
6. Zhong Dafeng. (2020). The Concept and Practice Trend of Polysemy Film and Television Education. *Modern Communication: Journal of Communication University of China*, 42(11), 6.
7. Ministry of Education . (2019). *Circular of the Ministry of Education and Five Other Departments on the Issuance of the Action Plan for the Revitalization of Teacher Education (2018-2022).* https://www.gov.cn/xinwen/2018-03/28/content_5278034.htm?tdsourcetag=s_pcqq_aiomsg
8. Zhang Siqi. (2016). *Research on the Design and Practical Effect of Project-Based Primary School Mathematics Learning Based on Network Environment*. (Doctoral Dissertation, Shaanxi Normal University).
9. Yang Wenming. (2010). The Connotation and Classification of Project-based Teaching. *Journal of Chinese Language Education: Foreign Language Education and Teaching*(7), 3.
10. Liu Jingfu, & Zhong Zhixian. (2002). Project Based Learning (pbl) Model. *Foreign Education Research* (11), 18-22.
11. Gao Zhijun & Tao Yufeng.(2009). Application of Project-Based Learning (PBL) Model in Teaching. *Research on audio-visual Education* (12), 92-95.
12. Xia Xuemei.(2019). From Design Teaching Method to Project-Based Learning: A century of Change, a Repeat of the Past or a Rebirth from Nirvana? *Chinese Journal of Education* (04), 57-62.
13. Li Na. (2013). The Application of Constructivism Theory in Nursing Education. *Examination Weekly* (18), 160-161.
14. Hoagland, M. A. (2000). *Utilizing Constructivism in the History Classroom*. ED482436.
15. Liu Y. (2013). Feasibility of Project-Based Teaching in China from the Perspective of Foreign Vocational Education. *Heilongjiang Traffic Technology* (11), 153.
16. Han Fengqin & Yu Wenjie.(2016). The Cultivation of German "Craftsman Spirit" and its Inspiration to China: From the Perspective of Vocational Education Management Model. *Local Finance Research* (09), 101-106+112.

Appendix 1: The Teaching Satisfaction Survey Questionnaire

1. Teachers of film and television production courses often utilize information technology methods for teaching.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
2. During the teaching process, teachers will provide you with sufficient time for reflection and consolidation of knowledge.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
3. The existing structure of teaching segments is reasonable, rigorous, and well-organized.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet

4. The current teaching methods in the film and television production courses are effective in improving your learning outcomes and align well with your practical needs.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
5. The teaching methods of the film and television production courses currently align with the characteristics of the curriculum.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
6. The teaching content of the film and television production courses is abstract and difficult to learn.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
7. The cases used in the teaching process of film and television production courses are interesting.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
8. The existing teaching content is logical and easy to understand.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
9. The current curriculum is designed based on students' learning patterns and future job requirements.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
10. During your internship in a company or training factory, you are able to apply the knowledge from the courses to solve practical problems.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
11. In the process of learning, you tend to actively construct a knowledge system and take on the role of being the subject in teaching.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
12. In the process of learning, you are not just passively receiving knowledge from teachers, but also actively engaging in thinking and expanding upon it.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
13. During your learning process, you will actively ask questions or answer questions.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
14. You actively participate in classroom discussions and frequently collaborate with classmates during the learning process.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
15. In classroom teaching, teachers can constantly monitor your learning progress and provide tailored instruction based on individual needs.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
16. You are satisfied with the existing teaching resources and do not find them outdated or limited.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
17. The teaching resources used in the course instruction are frequently updated.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
18. It is easy for individuals to develop a systematic knowledge structure or practical skills through the use of current teaching resources.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
19. You are satisfied with the current teaching evaluation method.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
20. The teaching evaluation of the film and television production courses will assess aspects beyond students' course grades.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
21. The teaching evaluation of the film and television production courses assesses students' overall abilities improvement or their learning attitudes.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
22. You think the proportion of theoretical knowledge and practical skills in course assessment is fair.
A. Fully meets B. Relatively meets C. Generally meets D. Does not meet
23. Are you open to project-based learning?
A. Fully accept B. Accept to some extent C. Indifferent D. Cannot accept
24. Can adopting the project-based learning approach in film and television production courses enhance your interest and motivation for learning?
A. Completely possible B. Mostly possible C. Average/Generally possible D. Not possible
25. Do you think it is feasible to break down the content of film and television production courses into several projects for learning?
A. Completely feasible B. Mostly feasible C. Average D. Not feasible
26. Would you be willing to allow teachers to conduct experiments using project-based learning in film and television production courses?
A. Very willing B. Quite willing C. Indifferent D. Unwilling

Appendix 2: The Student Ability Survey Questionnaire
1. I enjoy discovering and exploring issues related to film and television production in life.
A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant
2. I believe that through hard work, I will definitely achieve excellent results.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

3. My classmates around me are all passionate about studying, which can motivate my enthusiasm for learning.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

4. I have established a clear learning plan for myself, including the duration of study and short-term goals.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

5. After I learn a new concept, I will self-assess to see if I have truly mastered it.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

6. After completing a chapter, I will evaluate my learning outcomes through self-assessment.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

7. I have a strong thirst for knowledge and constantly raise new questions during the learning process.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

8. During the learning process, I am able to accurately identify which knowledge point a problem is referring to.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

9. When encountering problems, I am always able to identify the root cause of the issue.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

10. After the teacher assigns learning tasks, I am able to choose appropriate online and offline resources and utilize various internet search tools to gather the necessary information.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

11. I am able to identify the most advantageous information for problem-solving among all the gathered data.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

12. When learning new knowledge, I often connect it with my previous knowledge.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

13. At the end of each chapter, I will summarize and distill the knowledge covered in that chapter, forming a network of knowledge.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

14. After completing the study of a knowledge point, I am able to independently apply it to problem-solving.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

15. I am adept at concretizing abstract knowledge for better understanding.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

16. When encountering complex issues in film and television production, I often try to break them down into smaller, simpler problems.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

17. I often discuss issues related to film and television production courses with other classmates or teachers.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

18. When encountering unfamiliar problems in my studies and daily life, I will promptly seek guidance from teachers and classmates.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

19. In the process of problem-solving, I usually address general issues first before tackling specific ones.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant

20. In the process of problem-solving, I usually come up with multiple solutions for a single problem.

A. Fully compliant B. Comparatively compliant C. Essentially compliant D. Basically non-compliant E. Completely non-compliant