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Design and Develop a Learning Innovation Based on Design Thinking to Promote Creative Thinking Of Freshmen Majoring in Film and Television

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ABSTRACT

The purposes of this study were (1) to design and carry out the learning innovation based on design thinking to promote the creative thinking of freshmen majoring in film and television, (2) to study the creative thinking ability of freshmen majoring in film and television before and after using design-based learning innovation, and (3) to investigate learners' satisfaction with design-based learning innovation. The sample included: (1) 6 experts in 3 aspects; and (2) 15 freshmen from a film and television university in China were randomly selected for practical teaching. Research tools included: (1) theoretical framework record sheet and design framework record sheet; (2) expert questionnaire from three aspects: content, media and design; (3) before and after assessment of students' creative thinking ability (fluency thinking, thinking flexibility, creative thinking, and detailed thinking); and (4) students' satisfaction with learning innovation questionnaire based on design thinking. This study adopted the research method of Richy and Kline (2007), which included three stages: design, development and evaluation.

The results showed that: (1) the innovative learning environment based on design thinking was consistent with the theoretical framework record table and the design framework record table; (2) both the pre-test and post-test of the four dimensions of creative thinking showed differences ($p<0.01$), that was, students' creative thinking ability improved significantly after teaching; (3) integrating the three aspects, the mean score ($\bar{x}$) was 4.10 and the standard deviation (S.D.) was 0.59, indicating that students were satisfied with the learning innovation based on design thinking.

Keywords: Design Thinking, Learning Innovation, Creative Thinking

Introduction

In July 2009, the promulgation of China's first special plan for the cultural industry marked that the cultural industry has become a national strategic industry. ("Cultural Industry Revitalization Plan", 2009) With the development of society, China's film and television professional education has become an

indispensable part of domestic higher education. With the development of social economy, people's spiritual consumption demand has increased, which has promoted the rapid development of the film and television cultural industry, and has put forward higher requirements for the quality level of drama, film and television professionals. Especially in the modern network information age, the drama, film and television cultural industry continues to internationalize ization, there is an urgent need for more film and television professionals with strong professional capabilities and innovative abilities (Lu Y H., 2016). Art colleges and film and television majors, as bases for cultivating and delivering film and television talents, are also faced with how to improve and innovate professional education methods in the process of marketization.

For film and television education and teaching, film and television professional courses have the characteristics of rich theoretical knowledge and strong practical operability. The main courses involved include audio-visual language, script creation, TV program production, micro-film creation, non-linear editing and other courses. These courses The ultimate goal is to train film and television majors to become outstanding film and television professionals after graduation. This requires college film and television major graduates to have the following abilities: First, be proficient in the most basic theoretical knowledge of the film and television majors and the most cutting-edge related technologies. development; the second is to have strong artistic accomplishment and keen creative thinking, and the ability to use film and television technology-related means to express ideas and recreate. To ensure that students majoring in film and television art can match the development needs of the film and television art industry in the later stage, laying a solid foundation for them to conduct in-depth study of the film and television art major or enter related industries to work in the next step. (Wang Dong, 2022) It can be seen that creative thinking ability is crucial to the learning of film and television majors.

However, research shows that the film and television professional abilities of most film and television major graduates cannot match market demand, so that not many can directly engage in the film and television industry, and even hundreds of thousands of graduates every year do not actually participate in the film and television major. At work (Gao Y., 2019). The reason is that the current education and teaching of film and television majors in colleges and universities still adopt the traditional classroom teaching model. Teachers are always in the main position in teaching, students are in a passive state to learn knowledge, and there is a lack of good interaction and cooperation between teachers and students. The classroom atmosphere of this learning model is dull and the teaching method is boring and single. This passive learning method is not conducive to stimulating learners' interest in learning, and they cannot devote themselves to further learning efficiently and focused. On the other hand, the film and television major course has Strong practicality and operability. The current teaching habits of film and television majors still divide the process of theoretical learning and practical operation into two independent stages, resulting in learners being unable to combine theory and practice well in the creative process. Blended together.

The process of design thinking can solve this problem very well. By constructing rich and flexible teaching interaction forms, it can form a two-way promotion of teacher-student relationship and promote

interaction and cooperation between teachers and students. The DEIPT model of design thinking at the Stanford Graduate School of Design is divided into five stages: empathize, define, ideate, prototype, and evaluate. Some researchers define design thinking as being able to analyze problems in real society based on human needs, design novel ideas through existing knowledge and skills, and continuously iteratively improve products in the process of solving problems until they are formed. The process of creating innovative works. (China Education Informatization. 2020(13)) This coincides with the goal of the film and television professional courses.

The focus of learning innovation lies in the process of learner-centered knowledge construction and practical application, rather than the traditional model of teachers unilaterally imparting knowledge and learners passively accepting knowledge. Therefore, this study aims to design and develop learning innovations based on design thinking, introducing design thinking methods into the reconstruction of course content and structure, through the collaboration of real situational problems, multi-level collaboration methods, multi-dimensional methods and tools, and innovative core concepts. Complete the learning practice, use the constructivist learning theory to change the learner's identity from passive to active, take the learner as the center, and combine the media characteristics to better apply the existing knowledge and skills foundation to creation and practical operations, and at the same time Promote learners' independent learning and thinking abilities, and stimulate learners' creative thinking and sustainable learning abilities.

This research can stimulate learners' interest in learning and promote learners' independent learning ability and creative thinking. At the same time, film and television professional educators can also use the research results as samples for education and teaching. Film and television professional learners or people working in film and television can learn from this learning method for lifelong learning.

Objective

1. Design and develop learning innovations based on design thinking to promote creative thinking of freshmen majoring in film and television;

2. Measure and evaluate the creative thinking of freshmen majoring in film and television;

3. Investigate learners' satisfaction with learning innovation based on design thinking to promote creative thinking ability.

Conceptual Framework

This study uses model research and adopts the research method of Richy and klein (2007), which is divided into three stages: design, development and evaluation, as shown in Figure 1 below.

Hypotheses:

Stage 1 (Design): How to design and develop learning innovations based on design thinking to promote the creative thinking of freshmen majoring in film and television

Stage 2 (Development): Expert evaluation of learning innovation based on design thinking, mainly in three aspects: content, media and design.

Stage 3 (Assessment): 1.Internal verification: Expert evaluation of learning innovation based on design thinking, mainly in three aspects of content, media, and design.

External validation: Initial variable: Learning innovation based on design thinking; Dependent variable: (1) Learners' creative thinking ability (4 dimensions); (2) Learners' satisfaction with learning innovation based on design thinking

Research Methodology

Stage 1 (Design): In this stage, literature research, context analysis and other methods are used

Stage 2 (Development): In this stage, questionnaire survey method is mainly used

Stage 3 (Assessment): Internal validation: Expert research methods

External verification: (1) Using pre-test and post-test methods to measure learners' creative thinking ability before and after using design thinking based learning innovation; (2) Questionnaire on students' satisfaction with learning innovation based on design thinking Population and Participants

1) 6 experts in three aspects (2 in content, 2 in media and 2 in design) to verify the quality of learning innovation in content, design and media;

2) 15 freshmen majoring in film and television in grade 2023 of an art university in China were taken as research samples to further conduct practical teaching verification of learning innovation based on design thinking.

Research Instruments

1) Conceptual framework record sheet and Design frame record sheet

2) Expert questionnaire based on content, media and design

3) Pre-test and post-test of students' creative thinking ability; (1) fluency thinking; (2) Flexibility thinking; (3) originality thinking; (4) elaboration thinking

4) Survey on students' satisfaction with learning innovation based on design thinking

Data collection

1) Investigate and analyze relevant literature, principles and theories, including design thinking, creative thinking, learning innovation, constructivism theory, etc., make a conceptual framework record sheet, and make a design framework record sheet based on the conceptual framework record sheet

2) Submit a learning innovation and evaluation form based on design thinking to experts, and conduct internal verification and evaluation of products mainly from three aspects: content, media, and design

3) Review the literature, principles and research related to creative thinking, as well as the content related to professional courses, based on the four dimensions of creative thinking (according to (1) fluency

thinking; (2) Flexibility thinking; (3) originality thinking; (4) elaboration thinking Elaboration of pre-test and post-test evaluation criteria

4) Student Satisfaction evaluation form is used to evaluate students' satisfaction with teaching and learning innovation based on design thinking, in order to improve the creative thinking of freshmen majoring in film and television

Data Analysis

In this study, literature research, quantitative and qualitative data analysis methods were used, which can be described as follows:

1) Theoretical framework and design framework.

2) On the basis of summarizing the quality of three main aspects of learning innovation based on design thinking and improving the creative thinking ability of freshmen majoring in film and television, the data received from experts is analyzed.

3) The pre-test and post-test reading comprehension were analyzed by matching sample t test (paired sample t test), mean score ($\bar{x}$) and standard deviation (S.D.).

4) Using the five-component scale method of mean Rensis A. Lkert (1932), the mean ($\bar{x}$) and standard deviation (S.D.) were used to analyze the evaluation scores of students' satisfaction. The results are explained as follows:

4.15 - 5.00 = Very satisfied

3.45 - 4.14 = Satisfactory

2.45 - 3.44 = Normal

1.50 - 2.44 = Not satisfied

1.00 - 1.49 = Very dissatisfied

Results

1 ・ Theoretical framework

Through the study of theories, principles, literature and related research, combined with the teaching characteristics of film and television majors, the theoretical framework for learning innovation based on design thinking and promoting the creative thinking ability of freshmen majoring in film and television majors is drawn (as shown below), which includes five bases: (1) Psychological basis, (2) teaching basis, (3) technical basis, (4) context basis, (5) creative thinking ability, (6) design thinking.

Design framework

the design framework has four components, including (1) Stimulates the creation of cognitive structures and promotes creative thinking skills; (2) Supporting cognitive balance (3) Promote the strengthening of cognitive structure and creative thinking; (4) Helps cognitive balance, which consists of five

elements: (1) problem base and learning task; (2) Learning resources; (3) Collaboration center; (4) Scaffolding; (5) Coaching.

2 • Experts assess the investigation

Content level: Experts reviewed the content of the learning environment according to the three main components of content characteristics, quantity and presentation, and the results showed that the content of film and television courses was consistent, the learning resources covered the early, middle and late stages of film and television shooting, and the presentation was simple and interesting. On the other hand, experts believe that multiple forms of resource presentation can be added.

Media level: Experts' review of this aspect found that the hyperlink text form supported by H5 technology can be quickly transferred and reduce space occupation, and the navigation device of mobile learning is correspondingly fast, can quickly open links, help learners find information easily, and the column design is clearly marked, and learners can quickly master the navigation and use methods.

In terms of design: (1) Problem base is the basic element of learning environment, which helps students to participate in the learning process, and learning tasks promote learners to analyze problems and find out the main reasons; (2) Learning resources provide students with the basic information to learn and use it to solve problems and complete learning tasks. (3) The collaboration Center aims to provide learners with the opportunity to collaborate with each other, provide learners with online editing templates and reference ideas, and jointly complete the corresponding learning tasks through cooperation. (4) Scaffolding can help learners outside the zone of immediate development (ZPD) to independently perform learning tasks. (5) Coaching, that is, the teacher changes his or her role to that of a coach.

3 • Pre-test and post-test of creative thinking

Creative thinking	evaluation	N	Full mark	Mean value ($\overline{x}$)	Standard deviation (S.D.)	t	p
fluency thinking	Pretest	15	15	7.27	2.69	-4.532	0.000 * *
	Post-test	15	15	10.27	1.1		
Flexibility thinking	Pretest	15	15	7.13	2.5	-6.696	0.000 * *
	Post-test	15	15	11.87	1.3		
originality thinking	Pretest	15	15	7.4	2.16	-6.325	0.000 * *
	Post-test	15	15	11.4	1.24		
elaboration thinking	pretest	15	15	8.6	1.99	-7.246	0.000 * *
	Post - test	15	15	12.6	1.18		

* $p<0.05$ ** $p<0.01$

As can be seen from the above table, when paired T-test is used to study the differences of experimental data, a total of 4 pairing pairs of data will show anisotropy (0.000 * * , $p<0.01$). The fluency level between the pre-test and post-test is 0.01 ($t=-4.532$, $p=0.000$), and the mean value of the pre-test (7.27) is obviously lower than that of the post-test (10.27). Flexibility thinking showed 0.01 level of significance between pre-test and post-test ($t=-6.696$, $p=0.000$), and the mean value of pre-test (7.13) was

lower than that of post-test (11.87). originality thinking showed 0.01 level of significance between pre-test and post-test (t=-6.325, p=0.000), and the mean value of pre-test (7.4) was lower than that of post-test (11.4). elaboration thinking there is 0.01 level of significance between the pre-test and post-test (t=-7.246, p=0.000), the average value of the pre-test (8.6) is lower than the average value of the post-test (12.6), and all 4 pairs of data will be variable.

5. Student satisfaction survey

Evaluation aspect	Mean value ($\bar{x}$)	Standard deviation (S.D.)	explain
Content level	4.02	0.59	satisfaction
Design level	4.01	0.57	satisfaction
Media level	4.27	0.61	Very satisfied
Entirety	4.10	0.59	satisfaction

Of the three evaluation aspects, the media aspect had the highest mean score ($\bar{x}$) of 4.27 and standard deviation (S.D.) of 0.61, indicating that students were very satisfied with the media aspect of the learning environment. The mean score for content was 4.02 and the standard deviation (S.D.) was 0.59. The mean score for design was 4.01 and the standard deviation (S.D.) was 0.57. It shows that students are satisfied with these two aspects. Finally, the average score ($\bar{x}$) is 4.10 and the standard deviation (S.D.) is 0.59, which shows that the students are satisfied with the learning environment.

Discussion

1) Based on the learning innovation of design thinking, the theoretical framework for improving the creative thinking ability of freshmen majoring in film and television consists of five bases: (1) psychological basis, (2) teaching basis, (3) technical basis, (4) situational basis, (5) creative thinking ability, and (6) design thinking. the design framework has four components, including (1) Stimulates the creation of cognitive structures and promotes creative thinking skills; (2 Supporting cognitive balance (3) Promote the strengthening of cognitive structure and creative thinking; (4) Helps cognitive balance, which consists of five elements: (1) problem base and learning task; (2) Learning resources; (3) Collaboration center; (4) Scaffolding; (5) Coaching.

2) Both the pre-test and post-test of the four dimensions of creative thinking show differences ($p<0.05$), that is, students' creative thinking ability improved significantly after teaching; This is consistent with previous research results, Yu Hongyan & Zhu Guanghui.(2019), Chen Yanyan & CAI Wenyi. (2020), CAI Lingyu & Tai Jie.(2024) et al. conducted research from the perspective of design thinking, and the results showed that students' creative thinking ability could be improved. In addition, Kwangmuang, P., Jarutkamolpong, S., Sangboonraung, W., & Daungtod, S. (2021) studied the influence of constructivist learning environment on creative thinking ability from the perspective of learning innovation, and found that, The learner's creative thinking ability has been improved.

3) In the three evaluation aspects of satisfaction, the average value is all > 3.45, which proves that learners are satisfied with the overall learning innovation based on design thinking. The average score of

media is the highest (4.27), and the standard deviation (S.D.) is 0.61, indicating that students are very satisfied with the media aspect of the learning environment. Satisfaction at the design level and content level is relatively weak, which may be due to the lack of detailed design and the lack of forms presented by learning resources, both of which need more improvement.

Conclusion/Limitations

1) The innovative learning environment based on design thinking is consistent with the theoretical framework record table and the design framework record table;

2) Both the pre-test and post-test of the four dimensions of creative thinking show differences ($p<0.01$), that is, students' creative thinking ability improved significantly after teaching;

3) Integrating the three aspects, the mean score ($\bar{x}$) is 4.10 and the standard deviation (S.D.) is 0.59, indicating that students are satisfied with the learning innovation based on design thinking.

Recommendations

1) Future studies can be more abundant in the design of learning resources, providing different forms, latest and cross-field learning materials to ensure sufficient learning resources;

2) In the future research application, consider using more advanced and diversified learning innovation tools to help learners gain a better sense of experience in the school process;

3) This form of learning can be widely applied to the film and television industry, not just on campus, to help film and television industry workers improve their work ability.

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