

Research on Innovative Communication Strategies of Zigong Lanterns under the STEAM Education Concept

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Abstract: Coloring lanterns are a resounding business card of Zigong City's culture, and are known as "Look at Zigong with Chinese colored lanterns". The dynamic inheritance and innovative development of lantern craftsmen are the core strength of Zigong lanterns' eternal vitality. Based on the interdisciplinary perspective of pedagogy and communication, an innovative communication development model of STEAM education concept+ Zigong lanterns is proposed, in which the emphasis on art can make the lantern craftsmen trained more "traditional+modern+future" "An open way of thinking. This article starts from the process of making lanterns, explores how the "design-based learning" model is integrated into the training process of craftsmen, and combines the "cognition and behavior" model in communication studies to explore the role of art education in cultivating the thinking and practice of craftsmen, and the role in constructing a living communication model under living inheritance. By inheriting the cultural genes of lanterns, strengthening the art education features integrated into STEAM, and cultivating the innovative abilities of craftsmen, we can realize the new physical design of lantern handicrafts and enhance the influence of lantern cultural communication.

Keywords: STEAM; Zigong Lanterns; Cognition and Behaviour

1. Introduction

In 1990, Zigong lanterns went global for the first time and appeared in Singapore, where they were given the title of "the best lantern in the world". In 2008, the Zigong Lantern Festival was included in the second batch of national intangible cultural heritage

representative projects, and was selected as the "most nationally influential" festival by the International Festival Association. In recent years, the Zigong Lantern Festival has continued to "break out of the circle", allowing more people to understand and love lanterns. At the same time, the practical activities of "intangible cultural heritage on campus" in colleges and universities have enabled more highly qualified talents with cultural heritage and innovative awareness to join the path of active inheritance of lantern intangible cultural heritage.

The core strength of the living inheritance of Zigong lanterns is people, and we focus on cultivating the new generation of lantern people, especially the "college student group" inheritors. Learning traditional skills and applying them to contemporary art is an impact way to work toward cultural sustainability.[1] This means that integrating the research and development of lantern technology with contemporary aesthetic design is a new innovative development idea for realizing intangible heritage. The art integration model in STEAM education emphasizes the importance of art, and exploring practical teaching methods that integrate science and art is a challenge to educators. Based on the concept of STEAM education, this article looks for the balance point between cultivating inheritors and adapting to social needs of traditional handicraft products "lanterns", looking for the integration path of lanterns and art education, and through specific teaching practice and social practice Expand the dissemination influence of lantern culture and let more young people be exposed to the theoretical study and practical application of lanterns, in order to achieve the purpose of "learning + practice + inheritance".

2. The Possibility of Combining STEAM Education Concept and Lantern Innovation

The STEM acronym emerged in the 1990s as an initiative promoted by the National Science Foundation to bring together science, technology, engineering and mathematics.[2] Adding art to STEM has been developed in recent years and has expanded the fields of art, humanities, society and other fields. The integration of art generally refers to humanities, language, form, music, art, handicrafts and other humanities and art disciplines. Art can be understood as big artistic concepts, artistic interpretations, visualization processes, design thinking, aesthetic literacy, and humanistic colors. In early childhood education, the integration of STEAM are advocated as contemporary educational goals.[3] STEAM is in pre-school give kids: Problems wide comprehensive to understand, Creative thinking, Engineering approach, Critical thinking, Scientific methods to understand and to apply, Design the basics understand.[4] In

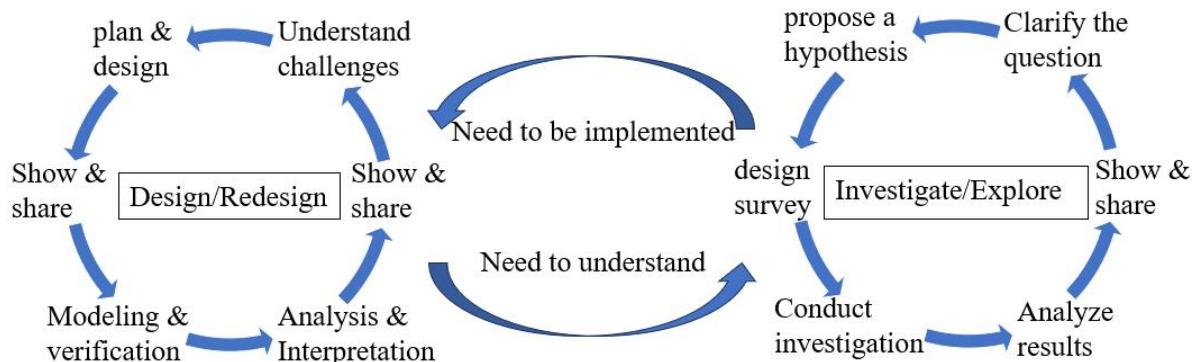


Figure 1. Design-based Learning Process

In the process of teaching lantern production, you first need to "understand the challenges", including understanding the abstract and concrete concepts of lantern design, clarifying the use of symbolic elements, frame proportions, color matching and other issues that need to be solved, expected constraints, production requirements and works Effect. After understanding the challenge and clarifying the goals and tasks, students need to "investigate and explore." In the cycle of investigation and exploration, students first clarify design ideas, propose implementable plans, hand-draw design drawings according to design needs, explore the cultural value expressed by symbolic elements, supplemented by computer design, preset effect presentation, and enter the implementation stage. And analyze how to

this process, it is essential that pedagogues, teachers, students, parents, and others be aware of international research on STEM education and have the skills to apply it in practice.[5]

Chinese research on STEAM education concept began in 2013. Currently, some relatively mature STEAM education models have been formed abroad, such as "project-based learning", "design-based learning", "5E learning loop", and "blended learning". [6] The process of making lanterns is essentially the process of designing products. Design-based learning is also called learning by design (LBD), which allows students to learn professional knowledge in design and develop the ability to solve complex problems by designing a specific situation. During the implementation process, students need to go through the two most basic cycles of the "design + redesign" cycle and the "investigation + exploration" cycle (e.g., Figure 1 design-based learning process). [6]

integrate the artistic characteristics of "shape, color, sound, light, movement", "exquisiteness, strangeness, skill, beauty and novelty" into a reasonable and limited space. Finally, we enter "Display and Sharing", where students share the results of communication and exploration and summarize general principles and experiences. General principles and experiences will become the content of "design/redesign", and then enter the "planning and design" and other recycling cycles. Generally speaking, characteristics of Zigong lantern craftsmanship (e.g., Table 1. Zigong lantern production process).

Zigong lanterns can ultimately present beautiful lanterns with different forms. Artists are the key players. The style of lanterns, the construction of the skeleton, the matching of fabrics, and the connection during the

assembly process all require the participation of artists. The artist's design of lantern products reflects the aesthetic characteristics of lanterns, which constitute human beings' "sense of home", that is, the return and watchfulness of spiritual home. Lantern culture explains that "beauty is a kind of release", giving people a sense of spiritual freedom and liberation. Stimulated by the needs of modern social life, lanterns, as traditional handicrafts, have experienced the inheritance of knowledge and skills and integrated into the aesthetics of modern art. They have quantitative standards and are full of the flexibility of humanities and art.

Table 1. Zigong lantern production process

Process steps	details
Artist gives drawings	The "front view" and "side view" of the lantern design renderings are printed on the computer according to the actual operating size of 1:1, and the detailed production process needs to be marked at key locations.
Fitter making shapes	The lantern frame is made of 16# to 8# iron wire and 6mm to 8mm steel bars to convert the lantern components into a three-dimensional shape.
Mechanical transmission	Install a motor on the lantern frame to achieve local dynamic effects.
Electrician installing lights	That is, "doing inner penetration". Built-in LED light source, as well as power distribution lines, lighting fixtures and other enhanced anti-leakage protection devices. Prevent accidents caused by electric leakage and injuries in rainy and snowy weather.
coat with paste	Using satin or eight-metal satin, the colorful fabrics are flatly pasted on the surface of the lantern frame, and sometimes gold threads of various colors are used for wrapping.
Artist coloring	Use an airbrush, airbrush, and acrylic paint to spray corresponding gradient colors on the surface of the mounted lantern.

3. Cognition and Behavior of “Art”: Artistic Agency in Lantern Products

The inheritance of lantern craftsmanship is mediated by the craftsmen themselves. The human being itself includes both the active body and the cultural ontology cultivated in specific situations. The practice of lantern craftsmanship is the embodiment of the two dimensions of "cognition" and "behavior". Cognition is the connection between the craftsman's thinking, brain and sensory expression, and behavior is the craftsman's technical skills and the linkage of the five senses. Connections between body functions. Therefore, only by achieving the unity of "cognition" and "behavior" in the inheritance and innovation of lantern techniques, that is, "linkage of internal and external functions", can the development of lantern art remain vital.

With the help of art, lanterns have gained new vitality and have a broader development space and inheritance background. Artistic thinking promotes rigor and creativity while allowing teachers to teach in a variety of ways, which in turn creates more avenues for thinking and the possibility of greater knowledge retention. [7] In addition to improving key "cognitive" abilities, the integration of art can also attract people, bring fun to learning, and thus promote "behavior". "Whether they are painting with free gestures or playing improvisational theater games, artists initiate creative work through activities that are fun, uninhibited, subversive, whimsical and without specific goals." [8] So when artists are immersed in process-based In the process of creating lantern artworks that are orientation-oriented, it is possible to create and think about serious works while maintaining a certain degree of playfulness.

The elements of STEAM education concept are applied in four aspects of lantern art education: 1. Cognitive culture, closely connecting knowledge and skills with complex and uncertain reality. 2. Stimulate interest in learning and provide innovative directions, and formulate and clarify key issues to be solved in the "Understanding Challenges" link. 3. Develop drawings, skeleton dimensions, and dynamic effect plans, control them based on actual problems, and finally form a plan that is implementable and easy to promote. 4. Make products according to the plan. After

displaying and communicating the products, absorb effective opinions or suggestions and constantly reflect on and improve the products. The integration of the role of artistic elements in STEAM and the practice of lantern crafts through "cognition" and "behavior" can form a joint innovation model. The specific model is analyzed (e.g., Figure 2. Analysis of the joint model of STEAM concept and lantern technology).

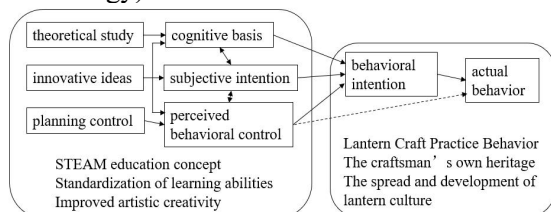


Figure 2. Analysis of the Joint Model of STEAM Concept and Lantern Technology

4. The Docking and Matching Path of "A+ Lantern" in STEAM

The integration of art in the STEAM education concept focuses on the impact and construction of students' thinking consciousness. The studio thinking proposed by Hetland et al. summarizes the role of art education in improving students' enthusiasm by studying the characters and skills developed by visual art habits. Eight aspects: learning craft, practice and persistence, imagination, expression, observation, feedback, expansion and exploration, and understanding the art world. [9]

In the process of cultivating the "cognition-behavior" of lantern craftsmen, studio thinking can be used to stimulate their creativity. Goodwin & Miller believe that "from a research perspective, 'creativity' tends to be an amorphous construct defined in a variety of ways, such as divergent thinking, heuristic problem solving, and right-brained thinking." [10] Craftsmen in Skills required to learn, explore and practice craft goals through divergent thinking and heuristic problem solving. For example, in the Interstellar Roaming Lantern themed exhibition, the characteristic elements of "Egyptian Palace Dance + Dreaming of the Tang Dynasty + Interstellar Roaming" are conceived, integrated and presented on lantern products, and combined with different artistic aesthetic knowledge to form lantern products appearance ideas. Craftsmen can focus on a

task for a sustained period of time, maintaining a mental image of what they want and are involved in, reflecting and correcting throughout the process, and persisting until they complete their goals, demonstrating engagement and persistence Propensity. The display of lantern products requires reflection on what you are doing and what it conveys to the audience. For example, the trunk of the "Tree of Life" banyan tree is an image of a "tree god" with both Eastern and Western facial beauty and ambiguous gender. The 2/3 eye-opening transmission is the visual perception of God, a Buddha-like gentle gaze but compassion. It conveys the primitive awe of life in nature and is the connection between art and reality.

Deeper meaning can be found through observation and investigation. Observe how the use of line, depth, color and shape described in the excavation art affects their creative mood and inspiration. For example, the Shan Hai Yi Zhi lantern themed exhibition is inspired by the Classic of Mountains and Seas. Art designers need to transform the mythological images, colors, and stories described in "The Classic of Mountains and Seas" into the language of lanterns, that is, through the folkloric lantern art to create a strong artistic atmosphere suitable for the night, creating a visual shock and impact. When a production designer is immersed in lighting design, self-evaluation becomes an ongoing part of the creative process. Reflection time gives designers the opportunity to examine their theoretical reserves and creative experiences and ask any questions they may have. Therefore, designers dare to question, dare to show their own personalities, and dare to express their different opinions. Based on understanding the power of meta-cognition, designers know that their development as future innovators are crucial during the creative process. In the process of modeling design drawings, expanding and exploring various themes will involve various aspects of knowledge, such as history, nature, folklore, region and even technology, etc. Artistic expansion is carried out on the basis of these seemingly independent concepts, it will go far beyond the superficial knowledge of independent concepts, and designers will interpret the world metaphorically through art.

5. Conclusion

The phenomenon of Zigong lanterns frequently "out of the circle" in the past two years did not happen overnight. As an old industrial city in southern Sichuan, it is based on more than 30 years of exploration of the lantern industry. The faces and hands of the previous character lanterns were originally directly assembled with glass, it looks stiff and fragmented. After constant changes and innovations, the routing of steel wires has become delicate and smooth. For example, "Goddess Jingwei" has exquisite facial makeup, distinct eyelashes, and expressive eyes, which perfectly integrates traditional craftsmanship with beauty fashion. Her eyes are integrated with the latest portrait collection technology, and can simultaneously present all the captured tourists to the live broadcast of the lantern festival by opening and closing them. It is a successful move in the innovative practice of "lanterns + culture + technology".

Since the training of Zigong lantern craftsmen, more than 80% of the art and technical backbone in the industry are professional talents trained by Sichuan Light Chemical University. Since the lantern art direction was established in 2018, more than a hundred people trained will basically choose the lantern industry as their first choice for employment. In the process of cultivating talents in higher education, art and technology programs focus on cultivating undergraduates with necessary skills to enter the workforce or continue education. The process of art learning in the STEAM education concept is to make students feel happy and fresh while retaining the content of traditional art. In art technology projects, students give less feedback on the act of creation and more on the thinking aspect of experiential learning, which also provides space for a balanced integration of "cognition and behavior" in their future career choices. Therefore, learning outcomes for college students include more than just the incorporation of arts or technology, but also include critical thinking, social engagement, and information literacy. These projects have a broad focus on combining practice and theory and are well aligned with the University's mission and vision. College students have the opportunity to participate in social practice projects led by teachers while they are in school. When they graduate, they can

accumulate good lamp-making experience and even form a team to do light exhibitions. Not only do they earn considerable income, but they also bring new energy to the lantern industry. They apply their knowledge to create a new generation of lantern aesthetics, craft production, cultural inheritance, and even external communication to tell Chinese stories well.

The "Report of the Zigong in 2023" also mentioned the need to implement lantern culture inheritance and development actions, make international brands such as the "Chinese Lantern Festival" and "Global Lantern Festival" more refined, and implement more than 70 overseas light show projects. In the process of external communication, high-level cooperation between individuals or teams from different backgrounds is the source of vitality for integrity and innovation in the lantern market. In addition, various forms can be adopted to integrate art and communication, allowing craftsmen to fully and comprehensively understand the essence of Chinese culture and the connotation of foreign cultures, and create brand power of lanterns. Craftsmen must continue to enhance their creativity, broaden their horizons, and discover unknown advantages, ultimately forming a new and evolving field with a large number of unique partnerships and high-quality lantern projects.

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