INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT

OPEN ACCESS JOURNAL

Vol 13, Issue 4, (2024) E-ISSN: 2226-6348

Art College Teachers' Status and Experiences of STEAM Education at a University in China

Wang Siwen[1], Normaliza Abd.Rahim[2]

[1]Infrastructure University Kuala Lumpur, Malaysia, [2]Taylor's University: Malaysia

To Link this Article: http://dx.doi.org/10.6007/IJARPED/v13-i4/23004 DOI:10.6007/IJARPED/v13-i4/23004

Published Online: 20 October 2024

Abstract

STEAM education concept integrates the knowledge of a variety of disciplines, and gradually forms a new model of comprehensive and practical education. The introduction of STEAM education concept is a great help to the development of art education. The value of art in STEAM education has gradually been popularized and recognized, and some academic activities and observation activities have been favored by many researchers and front-line teachers. At the same time, art has shown a powerful function in promoting the cultivation of creativity, critical thinking and other abilities. A deep understanding of the role of the arts in the STEAM curriculum is essential to raise the awareness of the importance of art education in STEAM. So thus, it promotes the development of STEAM education. However, in the process of STEAM education implementation, art education has often been neglected, especially the experience of art teachers in STEAM development needs to be paid attention, to pave the way for the future development of STEAM education. This paper adopts narrative interviewing on two Chinese STEAM art teachers. It makes an in-depth understanding and research on the experience and current situation of art teachers at this stage. Meanwhile, it creates a certain significance for promoting the development of STEAM education in China.

Keywords: STEAM Education, STEAM Teacher's Status and Experiences.

Introduction

STEAM education, as a new interdisciplinary comprehensive education model and concept, has been paid more and more attention by the world education circles. China has put forward the strategy and requirements of "Exploring the application of information technology in new education models such as STEAM (Wang & Wang, 2023)." As the representative of "A", art, due to its visual, graphic, aesthetic, creative, cultural and other characteristics, has realized a new way to creatively discover problems, analyze problems, and solve problems in the STEAM project (Chen, 2023). At the same time, it also realizes the value of art education in educating people and serving society.

However, at present, there are some problems in our art teaching system, such as the simple teaching method, the lack of connection between disciplines, and the short of education platform informatization. First, relevant schools and institutions that independently study and implement STEAM education concepts need to be further developed, and STEAM education currently lacks unified and effective platform support (Cai, 2022; Chen, 2023); Second, at

present, there are few studies on the combination of STEAM education concept and art education, and in-depth studies on the specific implementation process need to be further strengthened. According to Cai (2022), some activities in the actual STEAM programs, are although ostensibly relying on art disciplines, but due to the serious impact of STEM education. It has been the lack of attention to art, or only stay in the form. Third, the teaching status of STEAM teachers is easy to be ignored, and the teaching experience gets less attention. (Wang & Wang, 2023) Therefore, it is meaningful to study the teaching status and experience of existing teachers, it can be the reference of the STEAM education development study.

Literature Review

STEAM education is short for Science, Technology, Engineering, Art, and Mathematics. In 1986, "Undergraduate Science, Mathematics and Engineering Education" in the United States proposed that STEM education is a comprehensive education model consisting of multiple disciplines and applying interdisciplinary thinking, and serves as a national strategy to provide comprehensive talents for the society (Wan, 2024; Wang & Wang, 2023). In 2006, American scholar Georgette Yakman added art elements to STEM education, thus forming the concept of STEAM education. As a new element of STEAM education, art has the function of enhancing students' aesthetic ability and creativity (Wei et al., 2023). The STEAM education concept emphasizes that students should start from the practical problems observed in study and life, flexibly apply science, technology, engineering, mathematics, art and other relevant knowledge to solve problems, and cultivate students' practical ability and problem-solving ability (Yue & Zhao, 2021).

In Wang &Wang (2023), article, it states that, by studying the development cases of STEAM education concepts in our country, we can find that the application of STEAM education concepts in art teaching is still in its infancy, and the popularity is increasing in recent years. According to the national conditions, China has put forward the vision of STEAM education in the future, and the policy of education popularization. STEAM education has been carried out in many first-tier cities and some second-tier cities. Nevertheless, in the studies of Wang et al. (2020) and Wan (2024), it is jointly mentioned that there is no unified standard for the standards and evaluation mechanism of STEAM courses and products, and the preparation for the construction of teachers is not complete, and they lack the ability to integrate disciplines. Moreover, the lack of STEAM teachers is also the biggest problem facing schools, and the professional teaching ability of teachers is the biggest bottleneck restricting STEAM courses.

In Locke’s study, it believes that, all knowledge is based on experience, which is summarized from the experience of events, and is the link between knowledge and theory (Yolton, 1963). In addition to theoretical guidance, empirical research is also necessary. From experience you can understand the current situation and development process of things, as well as the result (Wang et al., 2023). In STEAM teaching, besides mastering the feedback and results of students, it is also necessary to conduct in-depth analysis of the experience of front-line teachers in order to discuss the theories better.

China's new curriculum reform combines constructivism theory and multiple intelligence theory, which is closely related to the theoretical basis of STEAM education concept.

Constructivism Theory was introduced by Jean Piaget in 1966. It advocates the use of inquiry to discover problems and complete teaching objectives. STEAM education concept also emphasizes the initiative of students to acquire knowledge and build a new knowledge system while drawing conclusions (Chen, 2023). The setting of curriculum standards should be based on real life, help students to connect with life to perform art, form a good aesthetic ability, innovative thinking, creativity, and promote the overall development of students (Wan, 2024; Wang et al., 2020). The Multiple Intelligence Theory is an important theory published by Howard Gardner (1983). He believes that each person has multiple intelligences, but their manifestations or levels of development are different. The STEAM education concept guides students to change their learning methods, carry out inquiry learning, experience learning, etc., and promote the all-round development of students through a variety of learning methods (Cai, 2022). This suggests that teachers should fully respect students' personality and self-esteem in the process of education, give students space to give full play, let students design their own learning methods to complete tasks, and encourage students to imagine boldly, so as to enhance creativity.

The purpose of the study is to explore the art college teachers' status and experiences of STEAM education at a university in China. Therefore, there are two research objectives of the study, they are:

1. To investigate the art college teachers' status of STEAM education at a university in China.
2. To analyze the art college teachers' experiences of STEAM education at a university in China.

Methodology

Narrative interviewing is an approach to eliciting people's accounts, or stories, of their experiences. It is mostly valued as a style of interview that seeks to get close to what is most important to participants through allowing them to focus on their own perspectives and priorities, using the language and terms that they prefer. (Ziebland, et al. 2013) Meanwhile, Cresswell (2013) states that "narrative research is best for capturing the detailed stories or life of a single individual or the lives of a small number of individuals." Therefore, this study adopted narrative interview with two purposefully sampled interviewees in Shenyang Normal University in China. The selection criteria are full-time art teachers with experience in STEAM teaching, one old teacher and one young teacher. The demographic information of the interviewees shows as Table 1 below.

Table 1
The Interview Samples

Interviewee	Gender	Age	STEAM Teaching Experience (number of Years)	Teaching Experience (number of Years)
S1	Male	55	3	20
S2	Female	32	1	3

The process of the interview is to get the permission from the participants first. Second, set an interview time with the interviewees and record it with Tencent Meeting Application.

Third, organize all interviewees' materials and make written records. Finally, according to the research objectives, analyzed the results.

Around the research objectives of this paper, it is mainly divided into the research on the art college teachers' status of STEAM education, and the exploration on the art college teachers' experiences of STEAM education. In the exploration of teachers' experiences, in order to accurately achieve the research purpose and get the implementation of the interview, this study does a deep interview based on the different dimensions from the research "The inspiration of STEAM education concept to art education in China" by Wang& Wang (2023). The three dimensions are: 1. The inspiration of STEAM education concept to art teachers; 2. The inspiration of STEAM education concept to art students; 3. The inspiration of STEAM education concept to art course design. In this article, it plans to adopted three dimensions as the main interview topics. However, the two interviewees mentioned a lot of arguments about the future development of STEAM education during the interviewing. Thus, this research puts forward to have four dimensions as the teachers experiences summary in the research results, they are: 1. STEAM Education Developments for Art Teachers; 2. STEAM Education Developments for Art Students; 3. STEAM Education Developments for Art course design; 4. STEAM Education Developments for Future Art Study.

Results and Discussion

The Art College Teachers' Status of STEAM Education at A University in China

After years of development, STEAM education in China has achieved considerable results. Local governments are actively exploring the development model of STEAM education. At the same time, many relevant educational institutions have cooperated with universities to set up STEAM theme labs to promote the integrated development of STEAM educational theoretical research and practical application. This section responds to the research objective 1 of the article.

Firstly, STEAM education emphasizes connections and cooperation between schools and teachers. In response to the current situation of STEAM education, S1 says that "STEAM education is in a developing state in China, and all STEAM teachers are active when faced with challenges. Many regions have been supporting STEAM education in primary and secondary schools, allowing students to participate in this training from an early age. The increased contact and cooperation between schools and colleges and universities is very worthwhile." S2 agrees with S1's idea, and says that "I have seen many primary schools have started to carry out STEAM courses, and some teachers have studied STEAM academic issues with me, and we often have contact with each other and discuss phased research issues together. I don't think there's a grade level. It's a great way to learn from each other, and sometimes I get a lot of inspiration from the feedback from the primary students." It confirms that STEAM education currently has teachers cooperating with each other, establishing teacher networks and creating a national teacher professional community. Secondly, STEAM education began to increase funding support. S1 gives the idea of "STEAM education as a new education model, it needs to get a lot of capital investment to make it have the opportunity to tolerate mistakes. We are all trying and we all want it to develop well, so financial support is very important. At present, many enterprises have signed projects with the school, and the enterprises have invested money to ensure the progress of the project. At the same time, it is also helpful for the enterprise, because it has more talents and innovation." S2 and S1 have the same idea, "A

project needs a lot of money to be implemented, and the school's project is started by relying on the funding from enterprises. Right now, I have a series of plans with a programming company to complete a digital programming model this year, and without their support, I think it would be very difficult to proceed with the model." This shows that the help of funds will promote the development of new educational mechanisms, which is also the development goal of STEAM education in our country. Thirdly, our country has been in the stage of imitating and exploring for the teacher training strategy. S1 explained that "Our country's teacher training is mostly based on learning from foreign models. We have always been a traditional single-discipline education, and the addition of STEAM education makes us feel that there is a certain gap and there is a lack of operability. We need a unified model of training, but also in a Chinese way and local way." Moreover, S2 adds the thought from S1, "We should not only borrow theoretical knowledge from abroad, but also develop our own set of models, even refined to each region and each province." Different regions have different situations, so we should proceed from reality and students' problems. This shows that STEAM education in China should have a unified training standard, continue foreign theories as guidance, combined with local education practice.

The Art College Teachers' Experiences of STEAM Education at A University in China

The exploration of education research is multifaceted, and in the study of teacher training programs, emphasis should be placed on the existing teachers (Wang et al., 2020). The teaching experience of the current teachers is first-hand, research-oriented and valuable. This paper mainly focuses on the following four dimensions for the two interviewees. At the same time, this section responds to the research objective 2.

STEAM Education Developments for Art Teachers

Teachers feel that more effort is needed to prepare for STEAM teaching. S1 says that, "In the past, we only needed to teach basic art techniques and skills, and then extend knowledge and increase creativity. I think it is more focused on art itself. But now, the addition of STEAM system is not an easy thing for us old teachers. In the preparation of the lesson, more time needs to be added, more work, because it takes time to prepare the study plan besides the art. It makes me complain sometimes." However, S2, as a young teacher, has a different idea, she likes the new teaching model under STEAM, and says that, "The traditional teaching method is the foundation, but I think the STEAM teaching method is not to completely change the tradition, but to extend it on the basis of it, the teacher from the narrator to the guide, which is actually difficult, because you know that the students will not do exactly according to your plan, but when you throw a question, they will have countless ideas waiting for you to respond, which is interesting. It also broadens my vision. Just like in programming class, I set up a car that is going forward in 2 dimensions. It can turn, can move back and forth. But the students make a three-dimensional trajectory, and the car could travel into the sky and spin around at will. This makes me satisfied, and I feel more excited than ever, because I am also following their innovation. Within the scope of updating knowledge. I'm more concerned that I'm making progress while I'm giving knowledge." This may indicate that age and years of teaching experience can affect teachers' feelings about the STEAM education system. Older teachers find multidisciplinary education challenging and prefer traditional teaching methods and lesson preparation. Young teachers believe that multi-disciplinary education is a challenge, but it can be renewed in self-innovation.

STEAM Education Developments for Art Students

Teachers think that some students tend to confuse the knowledge of multiple subjects. S1 said, "For students, I think they learn multi-subject knowledge, it is easy for them to confuse the focus. Some students are easy to be attracted by the knowledge they are interested in, ignoring that art is the focus of the course. For example, in the course of '3D Max Design', I guided them to make fan models, and some of them spent a large proportion of their time thinking about how to make the fan rotate in order to succeed, rather than thinking about the art design of the fan itself and mastering the skills of using the software. It made me feel like I didn't have enough class hours and even wonder if I was an art or science teacher." However, S2 has a different view on knowledge confusion. She thinks that I don't think so about knowledge confusion, because everything can't appear alone. "Even with fine art, you have to study whether charcoal or pencil is better for your picture and the emotions and ideas you want to express. Their textures are different. However, I think the combination of disciplines needs to have a focus for students, and the proportion of art as the leading role cannot be reduced. In this way, students will naturally not be troubled." Moreover, teachers also believe that most students are active and enjoy the interdisciplinary education process. S2 says that, "Most of the students enjoy the interdisciplinary model, these people are very positive thinking. They love learning, the challenge it brings and the spread of creative thinking." However, some students hold a negative attitude. S2 adds that, "Indeed, some students often say that they have no ideas and just want to copy existing works. They don't know how to think and are unwilling to think. For these students, I think it should be a sad experience." At this time, the teacher's guiding responsibility seems to be more important. S1 and S2 have the same idea: "Teachers should guide the students with negative thinking more actively and make them change." This shows that the idea with student-centered and guiding has been formed and implemented.

STEAM Education Developments for Art Course Design

Art comes from life and reflects social life. In the teaching of art, teachers should follow the STEAM education concept, let students find and solve problems in life, and improve students' comprehensive ability. In the STEAM curriculum, teachers can use a variety of teaching methods to improve learning efficiency and encourage students to learn independently. Regarding uniform standards for the curriculum, S1 argues that there should be a uniform standard, and states that "there is no uniform standard. Schools, education bureaus, and even the country do not have a unified plan and policy. This makes all teachers very passive, can only follow their own experience and imagination, coupled with some books and literature guidance, which is not perfect. I think if it has new ideas to carry out reform, it needs a unified system to strictly regulate, rather than by trial and error. Besides, everyone's experience is different, and student groups are different, to different degrees." However, S2 has different idea on the unity of curriculum setting. She believes that curriculum setting should be unified after sufficient experience is accumulated, and says that, "Although the state has not issued a uniform setting requirements, but I think this is actually a right thing. Because each province, each city, and even each school has its own actual situation, our STEAM education is still in the initial development stage, how can we reach a unified standard so quickly? If everyone had the same model, I wouldn't be able to spread knowledge the way I want to, and I'm a very thoughtful person." Moreover, on the connection between disciplines, S1 believes that it is difficult to form a close connection between multiple disciplines, he states, "The specialty system has been in place in our country since the beginning, and each discipline has a strong

focus. In addition, I believe that only by focusing on learning can we have a deeper understanding and commitment to the subject and have good results. On the connection between disciplines, S1 believes that it is difficult to form a close connection between multiple disciplines, he states that, "The specialized disciplinary system has been in place in our country since the beginning, and each discipline has a strong focus. In addition, I believe that only by focusing on learning can we have a deeper understanding and commitment to the subject and have good results. As for the connection between disciplines, for me personally, I like to connect only one discipline other than fine arts, such as science, physics or mathematics, in an interdisciplinary course, and it is very simple and basic, because I do not understand too much about the complexity, I do not have the confidence to link other disciplines too much." Nevertheless, S2 offers a different idea, and she believes that the connection between multiple disciplines is a positive enhancement, she states that, "STEAM focuses on synthesis and span, so that knowledge is combined. When preparing the lesson, I found it very interesting, because not only art was used as the basis, but also many other knowledge, such as engineering, mathematics, computation, etc. I think it is like drew a circle, while art as the dot and other disciplines as the radius, so all the knowledge in this circle could be used as knowledge acquisition and to enrich the area of knowledge. In the course setting, I would ask experienced teachers for previous teaching experience first, the way students like to teach and what they are not interested in, and then add my own ideas. I think the design of each of my courses is good and meets the expectations of the curriculum, the student feedback is very good, and the classroom atmosphere is very active and energetic." This may indicate that S1 and S2 have different ideas about curriculum due to their age and educational experience.

STEAM Education Developments for Future Art Study

The cultivation of students' learning ability requires that students not only have specific knowledge and skills, but also need the willingness and ability of lifelong learning, so as to continuously enrich their ability structure and form the ability to solve problems. Therefore, the future development of art education in STEAM education is very important. Both S1 and S2 agree that this is a challenge but full of possibilities, and that the future development of STEAM education is expected. S1 says that, "Although I complain a lot about the difficulty of interdisciplinary or comprehensive research, I think it is a good thing, it is more adapted to the environment and ideas of the new society, and it is the trend of the future development of education." However, S1 thinks it can be stressful and challenging for older teachers, "Even though I understand that this is a new educational trend, but it does not mean that I can accept the pressure it brings me, in this change in curriculum design, I think we are the experimenters, I provide experience and data to future scholars, but this is only a few points of experience, I do not know how useful it will be." In any case, I still hope that STEAM has a good future, because now the society has developed very well, we need more comprehensive talents." In addition, S2 gives some ideas on the future employment of students developed by STEAM, "Now the society needs interdisciplinary talents, only to learn a single knowledge is one-sided. Among our art graduates, they can only work as artist or art teacher after graduation, but graduates in the past two years have more career choices, such as interior designer, art programming programmer, product designer and so on. Because they are exposed to more knowledge in the interdisciplinary teaching of the school and learn more about the possibilities that the fine arts open up." This shows that as “A” links in STEAM, although it is a late addition, it is the beginning of more possibilities.

Summary of Results

In the development of STEAM education, teachers believe that there is a strong cooperation between them, which is consistent with the views of Wang, et al. (2020) and Wang & Wang (2023). In the process of college art education, higher education and basic education are inseparable. Students start interdisciplinary education from an early age and accumulate experience, so that higher education can be rewarded and continued accordingly. Secondly, STEAM education, as a new education model, is innovative and unknown. Therefore, a large amount of financial support is needed. The current model of school and enterprise alliance in our country is mutually beneficial. Companies provided the money, and schools provided the research and talent. In Wan's (2024), article, it mentions the same awareness, these cooperation models are formed spontaneously, without a large amount of unified capital investment by the state, and need attention at the national level. Third, in terms of STEAM teacher training, China has no unified curriculum standards and training models. Foreign theories and experience are only in the exploratory and research stage. The way of STEAM teacher training and the quality of normal university students need to be improved, so that it can form a combination of localization and internationalization.

In terms of teachers' teaching experience, although both S1 and S2 says that they needed more energy and time to prepare for the course, there were differences in attitudes. The old teachers think that this is in contradiction with the traditional art education, but the new teachers think that the STEAM education model is an extension of the direction of education, but also to improve their own ability. This point is responds to Cai (2022), and Chen (2023). This may indicate that one's own age and teaching age have a certain cognitive impact on the STEAM educational experience.

When teachers discuss students' experience, S1 thinks that it is a problem that students tend to confuse multi-disciplinary knowledge which is corresponds to Wei et al (2023). However, S2 has the same idea with Chen (2023), believes that the proportion of art in the curriculum can be adjusted to make art the leading subject, so that students can reduce the worry of confusion. Moreover, teachers believe that most students are positive towards innovative thinking and interdisciplinary learning, and a small number of students who are negative need to be guided.

For teachers' views on curriculum design, the unified standard of curriculum setting, S1's views is consistent with Wan (2024), and Wang & Wang (2020). They believe that it is necessary to have a unified set of standards and evaluation system, so as to make the STEAM education system complete, teachers will have better theoretical support. However, S2, as a young teacher, believes that it is precisely because there is no unified model in the initial exploration stage that this new type of education will be more localized, personalized, and have more possibilities and values.

For the future development of art education in STEAM education, respondents give a positive evaluation. The arguments are aligned with Cai (2022). Consistent, believing that through STEAM education, arts and STEM are integrated, demonstrating value and contribution to contemporary curriculum and teaching. Make students have the spirit of adventure and exploration, stimulate students' creativity. There are more choices for students' future employment. Although this is challenging, it is certain and expected.

Conclusion

In the development of modern society, art education should attach importance to the use of interdisciplinary educational thinking, pay attention to the integration of horizontal and vertical knowledge in the process of teaching design, guide students to understand knowledge from a comprehensive perspective, cultivate students' critical thinking and creativity, help students connect knowledge into knowledge networks, and improve students' thinking ability. At the same time, teachers should combine science and technology, enrich teaching forms, innovate education methods, and encourage students to carry out independent inquiry mode learning. At the same time, teachers should also pay attention to the social function of art education, improve students' aesthetic ability and enhance students' confidence in learning. Schools should also pay attention to improving teachers' teaching skills, carry out systematic STEAM education lectures, training, etc., so that teachers have a deep understanding of STEAM education concepts, and can put them into practice in the teaching process, and play the role of mentors.

Through the study of the current status and experience of art teachers in STEAM education, there is a driving effect on interdisciplinary integration, an innovative impact on teaching methods, an integrative role in educational resources, a positive influence on the cultivation of student abilities, an enhancement of teacher professional development, and simultaneously, it also improves educational quality and promotes educational reform. Specifically, in the STEAM education environment, art teachers need to change traditional teaching methods and adopt more inspiring and inquiry-based teaching approaches. By designing interdisciplinary comprehensive projects, they guide students in interdisciplinary comprehensive learning, fostering team cooperation awareness and problem-solving abilities. Therefore, the study of this article can provide the current phase of educational status for STEAM art teachers, thereby providing theoretical support and practical guidance for the future development of STEAM education in China.

References

Cai, T. (2022). The place of art in the STEAM curriculum. *Culture and Art*, 3 (24), 246-247.

Chen, X. Y. (2023). The strategy and practice of creative thinking training in high school art education. *College Entrance Examination*, 162-164.

Chen, Z. F. (2023). Practice research on improving students' thinking ability based on STEAM teaching method. *Examination Weekly*, (23), 1-6.

Cresswell, J. W. (2013). Qualitative inquiry and research design: Choosing among five approaches. New Delhi: Aage.

Wan, Z. Q. (2024). On interdisciplinary integration of fine arts and STEAM education. *Art Observation*, 3 (24), 63-64.

Wang, J. Y., & Wang, D. M. (2023). The inspiration of STEAM education concept to art education in China. *Art Education Research*, 3(23), 77-79.

Wang, W. Q., Ding, J., & Li, J. X. (2020). Analysis of the current situation of STEAM education teacher training in China in the recent ten years. *Educational Modernization*, 7(24), 42-47.

Wei, Z., Li, H., & Zhong, C. Z. (2023). The current situation, significance, and feasibility of STEAM course construction for general normal college students in higher vocational colleges based on interdisciplinary literacy. *Quality Education in the West*, 9(24), 31-34.

Yolton, J. W. (1963). The concept of experience in Locke and Hume. Journal of the *History of Philosophy,* 1(1), 53-71.

Yue, S., Li, X. & Zhao, M. (2021). Research on the Cultivation of Innovative Ability of College Students Based on STEAM Education Concept. *Science and Technology Management*, 22-23.

Ziebland, S., Coulter, A., Calabrese, J. D., & Locock, L. (Eds.). (2013). Understanding and using health experiences: Improving patient care. Chapter 5, "Narrative interviewing," 38-48. Oxford University Press.