



Review of Literature on Cultivating Innovative Practical Abilities of Students Majoring in Art Design in Local Universities

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Abstract

This article uses a systematic review to comprehensively sort out the literature results related to the cultivation of innovative practical ability of students majoring in art and design. Through sorting out relevant research papers, books, and academic articles, it sorts out related theoretical studies and sorts out the influencing factors of innovative practical ability. Sort out useful information from the theoretical and practical perspectives to establish a link between theory and practice. Through critical method research, this article identifies the gaps and deficiencies in previous research, explores further research directions, and puts forward research suggestions for improving the innovative practical ability of art and design students.

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1. Introduction

Article 5 of the "Higher Education Law of the People's Republic of China" stipulates: "The mission of higher education is to cultivate high-quality professionals with a sense of social responsibility, innovative spirit and practical ability, promote science and technology culture, and promote socialist modernization [1]. Therefore, school education must focus on talent training, innovate the talent training mechanism in colleges and universities, comprehensively improve the quality of higher education, and use the cultivation of students' innovative spirit and practical ability as a breakthrough. "Ministry of Education's Notice on Accelerating the Construction of High-level Undergraduate Education to Comprehensively Improve Talent Cultivation Capabilities" The basic principles in "Opinions" focus on promoting the all-round development of students, not only focusing on "teaching well", but also focusing on "learning well", stimulating students' learning interest and potential, stimulating students' patriotism spirit, being inspirational, realistic and practical, and strengthening students' The sense of social responsibility, innovative spirit and practical ability [2]. In summary, the national policy guidance shows that it is imperative to strengthen the cultivation of college students' innovative practical ability. Research on the cultivation of college students' innovative practical abilities has always been a key topic that scholars pay attention to. Countries also attach great importance to the cultivation of students' innovative practical abilities in educational policies and practical teaching. According to statistics from the China Journal Full-text Database (CNKI), it is known that in 2019, China Research on the cultivation of college students' innovative practical abilities has reached its peak, with a total of more than 20,000 articles.

The following research directions can be summarized from the existing research. On the one hand, it is a study of the characteristics of practical teaching in art design majors. On the other hand, it is a study of the current situation of practical teaching in art design majors. In addition, it is a study on solving the problems of art design majors. Research on measures to design professional practical teaching issues, as well as research on factors influencing college students' innovative practical ability and measures on how to improve college students' innovative practical ability.

The content of art design is composed of natural subjects, humanities and other multi-disciplinary directions, aiming to cultivate students to effectively master the knowledge and skills of natural subjects and humanities

through learning, and cultivate students' aesthetic ability, creative ability and innovative skills [3]. The art design major includes graphic design, environmental design, industrial design, new media design, etc. The art design major requires students to have computer design capabilities, work design capabilities, hands-on practical abilities, etc., and attaches great importance to the cultivation of students' innovative practical abilities.

Due to the particularity of the art design discipline, in the teaching of art design majors in higher education, we should attach great importance to teaching reform, the cultivation of students' innovative practical abilities, practical teaching, improve the practical teaching system, increase the proportion of practical teaching, be student-centered, and improve Students' innovative practical ability.

As early as 1919, the German Bauhaus period provided a good paradigm for art design teaching. It valued the combination of theory and practice, combined technology and art, and relied on real projects to train students' innovative practices in project-based teaching. ability. The Bauhaus education system had a profound impact on subsequent art and design education, establishing a modern design education system with a "new unification of art and technology" [4]. Germany advocates that vocational education should be based on the " dual system " education model. A large part of students' learning is completed in enterprises or companies, and the remaining small part is carried out in schools [5]. College education in the United States attaches great importance to the integration of industry, learning, and research. Corporate mentors serve as part-time teachers in colleges and universities, and students can obtain practical ability guidance under the guidance of corporate mentors.

The United States is the first country to realize the professionalization of design, and American universities are pioneers in linking academics and enterprises. Britain was the first to develop industrial design, and British universities have a systematic education system for art design. The art design major in Vienna hires experts in the industry or field to guide students, aiming to effectively play the role of educational guidance [6] .

The art design major is a highly practical major with clear teaching objectives, vivid teaching content, flexible teaching methods, open teaching links, and comprehensive teaching evaluation. However, there are still some problems in the practical teaching of art design majors, and there is an imbalance between demand and resources. Specifically, first, the basic teaching conditions are not sound enough, second, the teaching content is not perfect enough, and third, the practical instructors lack practical experience. There is a lack of practical ability and quality, and the fourth is improper management of practical teaching management measures [7]. Due

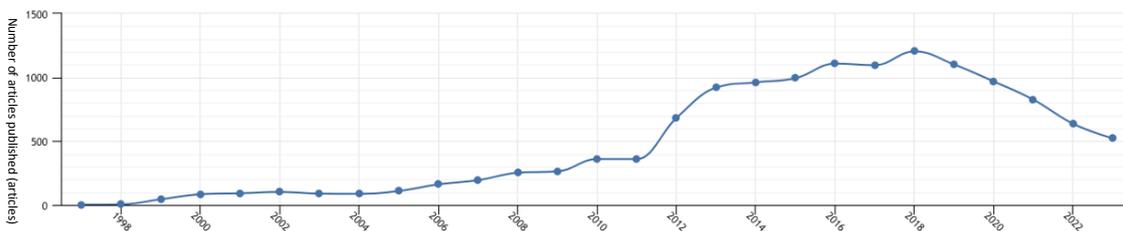
to the insufficient match between the number of students in the art design major and the allocation of teaching resources and the number of instructors, the organization and management of practical teaching are still extensive; the form of practical teaching is single and the content is outdated; the structure and quality of practical teaching teachers are lacking; and the practical resources in the school are relatively unknown. Problems such as shortage and low utilization rate [8].

Local universities are an important part of my country's higher education system, and they shoulder the important mission of cultivating applied talents. It is imperative to strengthen the education reform of art design major in local colleges and universities.

2. Methodology

This study uses system analysis and meta-analysis as the main research methods, specifically uses the literature research method, and uses "innovative practical ability", "practical teaching", "applied talents" as keywords, and through the Chinese Journal Full-text Database (CNKI) , Baidu Academic, Scopus, ERIC and other academic platforms to search to understand the latest research results in different dimensions and ensure that you know more different research perspectives.

Mainly based on the CNKI database, the literature research scope in it is from the end of the 20th century to the present. In the field of higher education, focusing on the cultivation of innovative practical abilities, there are more than 13,000 related studies, accounting for the total research volume in the entire subject distribution. 39.6%.



more solid theoretical support. Through literature research, the theoretical research perspective of cultivating innovative practical capabilities was sorted out. As well as the influencing factors of innovative practical ability, specific training strategies, and search for specific theories that can support the argument. In the literature research, PRISMA was used as a guide, a comprehensive search strategy was adopted, and articles containing theoretical frameworks and empirical data were used, including quantitative and qualitative research articles. The above different research directions and angles can more clearly demonstrate the research on cultivating innovative practical capabilities. This study hopes to contribute to a deeper understanding of this research field through a systematic analysis of existing academic articles.

3. Results and Discussion Results and Discussion

3.1 Theory driven

3.1.1 Constructivist theory

Constructivist theory emphasizes that students learn by actively participating in practical problems, solving problems, collaborating, and building their own understanding. This learning method can have a positive impact on students' innovative practical abilities. Students help construct their own knowledge and understanding through active participation, and students should become problem solvers, discoverers, and innovators rather than just passive recipients of knowledge. Papert advocated the use of tools such as computers and programming to support students' constructivist learning, believing that this would help cultivate students' innovative abilities [9]. The constructivist education method encourages students to actively think, explore and create, and cultivates students' innovative thinking and practical abilities when solving complex problems and facing new challenges.

3.1.2 Humanistic Learning Theory

Humanistic learning theory emphasizes paying attention to students' needs, interests and emotions, and creating a positive learning environment to promote students' innovative practical abilities. From the perspective of autonomy and self-motivation, Carl Rogers proposed the concepts of self-concept and self-realization, which emphasize students' active self-development and innovation capabilities in the learning process. Carl Rogers believes that in an educational environment that supports student autonomy, respects student needs and emotions, and encourages self-expression, students are more likely to develop innovative practical abilities.

Education should be student-centered, paying attention to students' needs and interests, and encouraging them to actively participate in the learning process . Educators are not only transmitters of knowledge, but also guides and supporters of students. Educators should create a supportive learning environment that promotes students' self-actualization [10]. From the perspective of emotional factors, the hierarchy of needs theory proposed by Abraham Maslow believes that satisfying physical and psychological needs is the prerequisite for learning, while satisfying social needs and self-actualization needs can promote innovative thinking and practice. From the perspective of individual differences, humanistic learning theory pays attention to the individual differences of students and believes that each student has his own learning style and rhythm. Scholar Carl Rogers emphasized the need for educators to understand the uniqueness of students in order to meet their needs. Humanistic learning theory encourages students to self-evaluate and reflect in order to better understand their own learning needs and goals, which helps students develop the ability to think innovatively and practice innovatively.

3.1.3 “Learning by doing” theory

John Dewey's "Learning by Doing" theory emphasizes that learning is obtained through actual participation and practical activities. This theory emphasizes that students accumulate knowledge and skills through practical experience, hands-on operations and practical activities [11] .

The "learning by doing" theory emphasizes practical experience and the stimulation of innovative thinking . Students may face problems and challenges in practice and need to find innovative solutions , which helps cultivate students' innovative abilities . The "learning by doing" theory emphasizes practical operations, and students have the opportunity to learn and master practical skills. The "learning by doing" theory provides opportunities for feedback . Students gain feedback and experience in actual projects, which helps students continuously improve and improve their innovative practice capabilities . Feedback can help them identify problems and try new methods. The "learning by doing" theory can promote interdisciplinary learning . Through interdisciplinary practical activities, students have the opportunity to integrate knowledge and skills in different fields , which helps to cultivate interdisciplinary innovative thinking and practical abilities.

3.1.4 STEAM theory

Through STEAM education, students have the opportunity to apply multi-disciplinary knowledge and skills to solve real-world problems, which helps cultivate students' innovation and creativity. STEAM education emphasizes interdisciplinary cooperation and teamwork, encouraging students to use knowledge and skills in different fields when solving practical problems. STEAM education also emphasizes practical learning and project-driven methods to enable students to put their ideas into practice, which helps students develop innovative practical abilities [12].

3.1.5 Multiple intelligence theory

The theory of multiple intelligences was proposed by Howard Gardner, which holds that humans have many different types of intelligence rather than just a single intelligence factor. These multiple intelligences include linguistic intelligence, logical-mathematical intelligence, visual-spatial intelligence, musical intelligence, motor intelligence, interpersonal intelligence, self-cognition intelligence, etc. The main impact of multiple intelligence theory on students' innovative practical ability is that it encourages the development of individuals in different intellectual fields, thereby contributing to multi-faceted innovation performance.

The theory of multiple intelligences has changed the way education is conducted, making educators pay more attention to individual differences and diversity, and no longer defines students solely by their performance on traditional intelligence tests. By fully developing students' different types of intelligence, educators can cultivate students' innovative practical abilities so that they can demonstrate creativity and problem-solving abilities in various fields. **Error! Reference source not found.** The theory of multiple intelligences emphasizes that each person has different types of intelligence, which provides diversity and richness for innovation [13]. Different types of intelligence can play a role in the innovation process, helping individuals come up with new ideas and solutions in various fields [14].

3.1.6 Sternberg's creativity investment theory

Robert J. Sternberg explores the relationship between wisdom, intelligence and creativity and proposes the creativity investment theory. He believes that investment in creativity is a gradual accumulation process that can be cultivated through learning, exploring and practicing different fields. Investment in creativity can improve the performance of individuals in innovative practices, and they can integrate knowledge and experience from different fields to come up with new ideas and solutions [15].

3.1.7 Deming cycle management method

The Deming cycle management method is a management method based on the PDCA (Plan-Do-Check-Act) cycle, which is usually used for quality management and improvement in organizations and enterprises. Although this method is mainly used in the field of organizational management, it can also be applied in the field of education to improve students' innovative practical abilities. John H. Clarke discusses how the Deming Cycle management approach can be applied to higher education institutions to create entrepreneurial universities (Entrepreneurial Universities). The Deming cycle management method emphasizes continuous improvement and feedback, which can help universities continuously adjust and improve their teaching, curriculum and management methods. This helps to improve students' practical skills and innovative abilities. Students learn in a continuous improvement environment and have the opportunity to participate in the solving process of practical problems [16]. The Deming cycle management method can help students conduct systematic learning and reflection, thereby improving their innovative practice capabilities. Students can plan learning goals and methods (Plan), then actually implement the learning activities (Do), then check the learning results and effects (Check), and finally make adjustments and improvements based on feedback information (Act). This process helps students develop autonomy Learning and problem-solving abilities that are critical to innovative practice [17].

3.1.8 Reflective practice theory

Educators and students can develop innovative solutions through continuous reflection and consideration of real-world problems. Schon proposed a cyclical process of "reflection-practice", which encourages learners to continuously think, experiment and improve in practice, thereby improving their innovative practice capabilities [18]. During the reflection process, students can gain a deeper understanding of the problem, explore potential solutions, and continuously improve in practice. This helps develop innovative thinking and practical capabilities.

3.2 Influencing factors

3.2.1 Educational resources (school resources, off-campus resources, facilities, teaching staff, teacher-student ratio, etc.)

Educational resources include school resources, off-campus resources, facilities, teaching staff, teacher-student ratio, etc., which have an important impact on students' learning participation and academic performance. A comprehensive analysis of international and domestic studies found that one of the most important factors in educational resources is the quality of teachers. The quality and professional development of teaching staff has a direct impact on student engagement and academic achievement. The quality of school facilities and resources can also influence student engagement in learning. Having a good learning environment and educational facilities can provide a better learning experience. The student-teacher ratio is another important factor that can influence how much attention a teacher gives to each student. A better teacher-student ratio usually helps improve student engagement. Out-of-school resources, such as family and community, corporate resource support, can have an impact on students' learning participation and academic performance [19].

Excellent teachers can stimulate students' interest in learning, improve students' academic performance, and encourage them to participate in innovative practices. The quality and quantity of teaching staff, as well as the school's educational facilities, can affect students' learning experience and participation, thereby having a positive impact on students' innovative practical abilities [20].

3.2.2 Teacher quality

On the one hand, teacher quality refers to the teacher's professionalism and ability, on the other hand, it refers to the teacher's attitude, views, ideas and other psychological qualities. Research on the impact of educators on students' learning activities involves educational psychology, educational management, educational evaluation and other fields. The cooperative learning method is helpful for students' learning participation and learning effects. Students can stimulate their interest in learning through collaborative learning. Teachers should emphasize on collaborative learning [21]. The comprehensive quality of teachers has a direct impact on teaching effectiveness and learning experience [22]. Improving the comprehensive quality of teachers will have a positive impact on education and teaching. The art and design profession attaches great importance to knowledge updating. Educators need to continuously improve their own quality to improve learning participation and learning effects. Teachers' professional knowledge and teaching methods and the ability to stimulate students' creative thinking can directly affect students' learning participation and learning effects. The interaction between teachers and students and teachers' educational philosophy have a subtle impact on students' creative development [23].

3.2.3 Student quality

Student quality consists of students' professional abilities and attitudes. Students themselves show different learning performance due to differences in creativity and imagination, differences in independent learning abilities, differences in subject knowledge and skills, differences in learning motivation, etc. Factors such as students' academic preparation level, learning motivation and self-regulation ability have a significant impact on learning participation and learning results [24]. Carol Dweck proposed the concepts of "fixed mindset" and "growth mindset", believing that students' beliefs and attitudes will affect their learning participation and performance [25]. Students can influence learning engagement and improve learning effectiveness through self-regulation and goal setting [26]. Students' learning strategies and metacognitive skills have an important impact on the learning process and effectiveness [27]. Student learning engagement has a direct impact on learning effectiveness [28]. Self-determination theory emphasizes the importance of student motivation to learning engagement. Meeting students' basic psychological needs can promote learning motivation and thereby improve learning effectiveness [29]. Students' learning strategies, goal orientation and self-monitoring skills have an important impact on learning participation and learning effectiveness [30].

3.2.4 Educational environment

The educational environment includes the cultural institutional environment and physical facility environment. The academic environment, social environment and campus culture in the university environment have an important impact on student learning and development [31]. The university environment will have an impact on students' cognition, emotion and behavior, including academic challenges, educational resources and social interaction, etc., affecting students' learning participation and learning performance [32]. The educational environment affects academic challenge, participatory learning, academic support, and social interaction, etc., affecting students' educational practices [33].

3.2.5 Course design

Curriculum design is the core link in the learning process, which directly affects the learning content and learning form. The curriculum design of the art design major should keep pace with the times, be in line with the times, adapt to market needs, constantly update knowledge content, and innovate teaching forms. Course design plays a key role in the student learning process, including how to stimulate students' active participation and

improve learning effects [34]. Learning understanding should be paid attention to in course design, and the understanding-centered course design method can promote students' deep understanding and active learning [35].

3.2.6 Educational evaluation

Educational evaluation is the evaluation of teaching design, teaching process and teaching effects. Through teaching evaluation, problems in each link and element of teaching can be fed back. The purpose of educational evaluation is to truly feedback teaching information and improve the entire process of education and teaching. Effective educational assessment can promote students' active participation and improve learning outcomes [36]. Scientific and valid educational assessment has positive impacts, including but not limited to improving student engagement and learning effects [37]. Teaching evaluation needs to be scientifically designed, and reasonable teaching feedback can improve learning participation and learning effects [38].

3.3 Specific measures

Through the study of previous research results, the following measures need to be taken to improve students' innovative practical abilities in terms of ability cultivation of art and design students.

3.3.1 Pay more attention to it, from the government and schools to teachers and students

The government has increased financial support, schools have strengthened the construction of supporting facilities, strengthened the staffing of teachers, improved the overall quality of teachers, strengthened incentive policies, and stimulated students' interest.

3.3.2 Improve various elements of teaching and enhance their positive impact

Strengthen the proportion of practice in the teaching process, pay attention to the practice link, build a high-quality practice base, attach importance to school-enterprise cooperation, introduce real projects, increase academic exchange activities, and design diversified evaluation methods.

3.3.3 Specific methods

In daily teaching, we always adhere to "student-centered" and build a "learning by doing" model. Students are encouraged to collaborate with classmates and professionals in diverse fields to promote innovation. Interdisciplinary collaboration can help students acquire different perspectives and ways of thinking, thereby stimulating innovative thinking. Design project-driven learning experiences that engage students in real-world projects that solve real-world problems. Provide advanced technical training and tools to help students better express their creativity, including digital design tools, 3D printing, virtual reality, and more. Provide mentorship so students can receive feedback and guidance on their projects. Help students develop critical thinking, encouraging them to examine problems and come up with new solutions. Students are encouraged to actively participate in the art and design community. Participating in the community allows students to learn about current innovation trends and build connections with industry professionals.

Understand students' learning needs and provide personalized learning plans and resources. Provide students with practical opportunities including internships, internships and volunteering. Enable students to apply the knowledge they have learned to actual situations and continuously improve their innovative practical abilities.

Establish an effective evaluation system to track the development of students' innovative practical abilities. Continuously improve the quality of training programs through feedback and improvements. Students are encouraged to conduct independent research and creation. Research can deepen their innovative practical capabilities and prepare them for future careers.

4. Future Recommendations

Through theoretical research and the study of the research results of various scholars, in order to better utilize the application of theoretical guidance in practical teaching, it is necessary to pay attention to the construction of various teaching elements and exert the positive influence of each teaching element in practical teaching. In practice, we continue to explore teaching resources that are beneficial to the development of students majoring in art and design, combine with cutting-edge scientific knowledge, and constantly update knowledge content.

Here are some suggestions for future research:

4.1 Further Comparative Studies

Continue to conduct comparative research on the basis of existing research, understand the views of other scholars and the latest research results, study optimization strategies from the perspectives of educational methods , educational environment , educational resources, educational strategies , etc., and conduct a comparison of international educational strategies for the teaching of art and design majors , understand the teaching planning programs of other countries, explore innovative education models based on specific national conditions, school conditions, and academic conditions, compare students' stage-by-stage innovative practice abilities, understand their growth and changing factors, conduct long-term impact assessments on students' innovative practice abilities, and establish a system suitable for students. Develop learning strategies.

4.2 Longitudinal Analysis Longitudinal Analysis

Conduct a longitudinal analysis of the research results of the past ten years to understand the research trends and phased results achieved. Sort out the research focus at each stage, clarify the influencing factors, and provide reference for subsequent research. Conduct research from a macro perspective, a meso perspective, and a micro perspective. Through the analysis of internal and external factors, we can better understand the changes. Through longitudinal analysis, we can more accurately grasp the key influencing factors on the cultivation of innovative practical capabilities.

4.3 Long Term Impact Assessment Long Term Impact Assessment

Encourage lifelong learning and build a sustainable evaluation mechanism for innovative practical capabilities. The long-term impact assessment of innovative practical capabilities is to study and evaluate how the innovative skills, ways of thinking and abilities developed by students during their learning and practice will affect their career and life development in the long term. The process includes career development, lifelong learning ability, social participation ability assessment, etc. Assessment of the long-term impact of innovative practice competencies requires a systematic approach to understand how students apply and develop these competencies after graduation and throughout their careers. Specifically, long-term impact assessments can be established in the following ways:

Establish a tracking system: Design a tracking system to track graduates' career development and learning experiences. This can be achieved through building alumni networks, social media, email and phone contacts. Be sure to maintain contact with graduates to obtain their feedback and information.

Conduct regular surveys: Conduct regular surveys to understand graduates' career status, career development, continuing education and participation in innovative projects. Questionnaires are an effective method for collecting large-scale data.

Conduct case studies: delve into the personal experiences and professional development of some graduates to understand how they have applied and developed their innovative practice capabilities. This can be done through interviews, case studies or focus group discussions.

Collect actual results: Collect graduates' actual work results, project results or innovation results. These results can be used as important indicators to evaluate the long-term impact of innovation practice capabilities.

Analyze data: Collected data is analyzed to identify any trends or correlations related to innovative practice capabilities. Compare the performance of graduates in different fields or industries to determine which factors have influenced the development of innovative practical capabilities.

Partner with employers and industry: Build partnerships with employers and industry to understand what they expect and need from their employees. This can help educational institutions better tailor their courses and training to meet market demands.

Track educational improvements: Make improvements to educational curricula, training, and support services based on evaluation results. Ensure that students receive adequate training in innovative practical abilities while in school and provide them with necessary support.

Share Results: Share assessment results with the educational institution's stakeholders, including students, faculty, administration, and policymakers. This helps improve the quality of education and curriculum design.

5. Conclusion

This study analyzes selected articles through a systematic literature review to sort out the key factors that affect the innovative practical ability of art and design students, including external and internal factors. The analysis of the literature further identified the theories supporting the influencing factors and established a theoretical framework. Provide valuable guidance for students to improve their innovative practical abilities.

Through a systematic review, explore various dimensions that affect students' innovative practical abilities, including political systems, social backgrounds, international education environments, etc. The national institutional level attaches great importance to applied talents. Enterprises and society need practical talents who can go deep into professional practice, and economics Under the circumstances of rapid development, innovative application-oriented talents who keep pace with the times are needed. Students majoring in art and design need to "learn from the past to create the present" and adapt to the needs of the development of the times through continuous innovation and practice.

When conducting a systematic literature review, a dialectical attitude is required, summarizing the key research findings, critically evaluating the existing literature, summarizing the research deficiencies and gaps, and conducting further in-depth research to strengthen in-depth exploration of the research. , at the same time, the systematic literature review will provide suggestions for further research and potential research areas in the future, propose new research methods, and research frameworks, which will help to more comprehensively sort out the factors that affect students' innovative practice ability, and improve the understanding of students' innovative practice from all walks of life. The emphasis on competency development encourages further exploration of this important area of research through a holistic literature review.

In short, the results and discussion of this study provide beneficial insights into the cultivation of innovative practical abilities of art and design students through a comprehensive systematic literature review.

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