

Exploration and Practice of Practical Ability Cultivation of "Aesthetic Design of Weapons" in the Master of Fine Arts Program

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Abstract: Aiming at the problems of insufficient breadth of curriculum system, limited practice resources, and incomplete knowledge of military aesthetic design in the master's degree of art and design, we take the elements involved in cultivating students' practical ability as the starting point, set up a group of shared professional elective courses of "machinery, art, weapon system and computer" to make up for the knowledge of military aesthetic design; modularize the design ability to expand the practical practice base; implement interdisciplinary "tutor group" to improve the effect of guidance. The pilot practice is carried out in the master's degree group of art design majors to change the existing cultivation mode and build a new cultivation mode oriented to practice, to comprehensively improve the students' practical ability of weapons aesthetics design.

Keywords: Aesthetics of Arms; Professional Master's Degree; Training Model; Practical Competence

1. Introduction

The professional master's degree is oriented to professional practice, emphasises professional practice and application, and cultivates high-level talents who have received formal and high-level training in professional and technical expertise. Under the background of "Seven Sons of Military Industry", "Aesthetic Design of Weapons" has a high degree of interdisciplinary and practicality, and the Master of Art and Design under "Aesthetic Design of Weapons" needs to have strong application-oriented practical ability. The master's degree in art design under "aesthetic design of weapons" needs to have strong application-oriented practical ability. In the cultivation of practical

ability of professional master's degree, Kai Wu and Xi Yang proposed the reform of the curriculum system to improve the practical ability of students by means of case studies, workshops and other practical courses.^[1] Qiangsheng An and Suling Feng proposed "multi-body, multi-platform" collaborative education to achieve the innovation and practical ability of professional master's degree in a diversified training mode.^[2] However, in the master of art design, the cultivation of practical ability is very limited, and also due to the limitations of the academic year and training needs, there is a certain contradiction between the practice of the master of art design and the degree acquisition, students face the double pressure of practice and thesis, which leads to the simplification of the practice process or even omitted. Zhanxiu Li believes that the curriculum system of master of art and design is not clear enough, and the courses taken are not synchronised with the practice, which makes the students' practical ability improve slowly^[3]. Fengyun Ji to the Nanjing Arts Institute to reform the art professional degree graduate education as an example, pointed out that the construction of the curriculum system should not only consider updating the course content and enriching the type of courses, but also increase the public elective courses, to provide students with interdisciplinary knowledge fusion opportunities, and to fully highlight the practicability of the art disciplines and openness to social convergence.^[4] On the basis of the construction of the postgraduate curriculum system, the selection of practice bases is also an important link in the cultivation of professional master's practical ability. Hongping Xu believes that according to the characteristics of the discipline, we can improve the innovative cultivation mode of professional master's degree

graduate students' professional practice ability from four aspects: tutor's practice teaching guidance ability cultivation, practice ability classification cultivation, practice base "rotation" cultivation, and comprehensive cultivation led by the subject.^[5] Xi'an Technological University Master of Art and Design to cultivate "weapons aesthetics design" practical ability as a speciality, also draws on the above practice, students' practical ability has been improved to a certain extent, but due to the special nature of the weapons industry, the practice opportunity is less, the students' weapons aesthetics design ability is not outstanding.

Through the study of the existing talent cultivation mode, it is difficult to obtain significant improvement in the practical ability of art design master's degree, this paper changes the existing art design-based curriculum system, builds a comprehensive elective course group; modularises the design ability, establishes the practice base mapped with the professional master's ability; guides the students to conduct students in the mode of tutor group, improves the students' practical ability of weaponry aesthetics. Improvement of the training mode in three ways to achieve a significant leap in the practical ability of the professional master's degree in art design under the design of weapon aesthetics, and to cultivate applied talents in line with the needs of the society.

2. Development of Aesthetic Design Skills for Weaponry

Weapon aesthetic design is a design method based on weapon aesthetics, and its main purpose is to optimize the aesthetics of weapon equipment without changing the functional and technical requirements of the weapon equipment itself, so as to simplify the shape of the weapon equipment and improve its performance. Weapon aesthetic design can, to a certain extent, from the material, modeling, structure, environment and other factors to improve the combat capability of weapons and equipment, in the actual combat process, lower loss, so that the combat efficiency is greatly enhanced. Under the new form, the ability of weapon aesthetic design involves the in-depth integration of external styling art elements such as form, color, structure, environment and other internal technical elements such as material, function, technology, man-machine and other

elements of weapon equipment. The complete knowledge of weapon aesthetic design covers six aspects of knowledge: appearance, special space, man-machine ergonomics, simulation test, camouflage and promotion and dissemination. A complete weapon aesthetics design program covers the five major disciplines of mechanics, art, weapon systems, and computers. Therefore, in the professional master's degree weapons aesthetics design ability training, it is a need for multiple fields and disciplines at the same time, on this basis, the following three modes are explored as a way to cultivate design practice ability based on the discipline of weapons aesthetics.

2.1 Building the "Four Plus" Group of Specialized Elective Courses and Sharing Teaching Resources

The existing curriculum system of master's degree in art and design mainly focuses on art courses, which cannot cover other disciplines involved in weapon aesthetics. In order to cultivate high-level talents with the characteristics of weapons aesthetics design ability, it is necessary to change the previous curriculum training system, break the professional barriers, screen the graduate courses of mechanical, art, weapon system, computer and other disciplines, and establish the elective group of weapons aesthetics for students to take, so as to make up the knowledge system of weapons aesthetics design, and lay the foundation of the students' research direction. The established group of courses takes art design as the main body, and the courses designed with weapon aesthetics in the disciplines of machinery, weapon system, computer and other disciplines are used as the support to build up the design system of weapon aesthetics, in the process of postgraduates' study, they can understand the design process of weapon aesthetics, and increase the details of the design through systematic study of related knowledge, so as to lay a foundation for the design practice afterwards.

At the same time of constructing the elective course group, we can make full use of information technology to build an online shared learning platform, summarize the resources of multi-specialty courses on the online platform, and form a high-quality shared teaching resources database, so that the

professional masters can supplement the insufficient knowledge on the basis of the elective course group, and realize the dual-mode course cultivation mode of "online + offline", and diversify and perfect the knowledge system of aesthetics of weapon for master's research.

Before the students take the courses, we first assess the students' design ability and research on the knowledge of weapon aesthetics, and then we formulate the elective program that meets the characteristics of each student through the students' knowledge of weapon aesthetics. Students' knowledge of machinery, weapon system, computer and other disciplines are different, and the elective courses they take are also different, so the development of elective programs in line with the characteristics of the students will help them to grow into practical talents in the new era.^[6]

2.2 Modularization of Aesthetic Design Capabilities for Weapons

According to the knowledge system of weapon aesthetics, it can be divided into four modular design capabilities, namely, industrial design of weapon equipment, human factors ergonomics design of special space, virtual reality experience design and visualization communication design. The traditional practice mode is to unify the professional master's degree in a practice base for internship, however, not all professional master's degree in this aspect of the practical ability needs to be improved, under the discipline of weapon aesthetics, this traditional practice mode is powerless, and it is impossible to carry out the targeted cultivation of professional master's degree with the requirements of the design ability of weapon aesthetics. Therefore, on the basis of the traditional practice mode, a targeted modularized practice mode is explored. This practice mode builds corresponding on-campus laboratories and off-campus practice bases on the basis of the four weapons aesthetics design competencies, integrates on-campus and off-campus practice resources, and establishes a mapping relationship between modularized design competencies and practice resources. Through the design ability module, practice bases with matching design ability can be found both on and off campus, solving the disadvantage of traditional practice mode for single ability cultivation and duplication of cultivation ability.

Professional master's degree in practice base practice for a period of time, its time ability to get a certain degree of enhancement, and then can be based on the ability to need to carry out the next stage of practice training, after learning in different practice bases, its ability to superimpose the module, and ultimately realize the complete weapons aesthetics design practice ability training. The enhancement of design ability cannot be separated from the practical education of professional master's degree, and the modularization of the design ability of weapon aesthetics is to strengthen the design ability of professional master's degree for the insufficiency of a certain aspect of the ability to strengthen the practice, and drive the enhancement of its ability through the practice to cultivate it to become a high-level practical talent with the characteristics of weapon aesthetics in the new era.

2.3 Tutor Group Tutoring Model

The high degree of interdisciplinary intersection in the design of weapons aesthetics makes the establishment of tutor groups in this discipline very operable. It is possible to form tutor groups through interdisciplinary, cross-institutional and cross-regional forms to provide convenient conditions for tutor teaching and graduate students' success. (Figure 1).

2.3.1 Interdisciplinary tutor group cultivation model on campus

Based on the background of engineering colleges and universities, give full play to the specialty advantages of engineering colleges and universities in science and engineering majors, construct the cultivation mode of on-campus cooperative tutor group, and optimize the combination of tutor resources within the cultivating colleges and universities to adapt to the cultivation requirements of the master's degree of art and design in the composite talents under the discipline of weapon aesthetics and design. Relying on the demand of cross-discipline of weapon aesthetics, the organization of multidisciplinary tutors constitutes tutor groups to provide interdisciplinary guidance to graduate students. This interdisciplinary tutor group guidance mode in the United Kingdom and the United States of America graduate education has attracted much attention.^[7] Such as the UK has been in the training of graduate students, especially doctoral students, often by

an academic team as a doctoral student's tutor, some cross or emerging disciplines of graduate students are often by several tutors to form a tutor group to jointly guide.^[4] Under the disciplinary demand of weapon aesthetics, universities can integrate experts and scholars of

art, machinery, weapon systems, computers and other disciplines to form a tutor group under the leadership of the Graduate School, and cultivate talents in line with the characteristics of weapon aesthetics design ability under the synergy of experts and scholars in various fields.

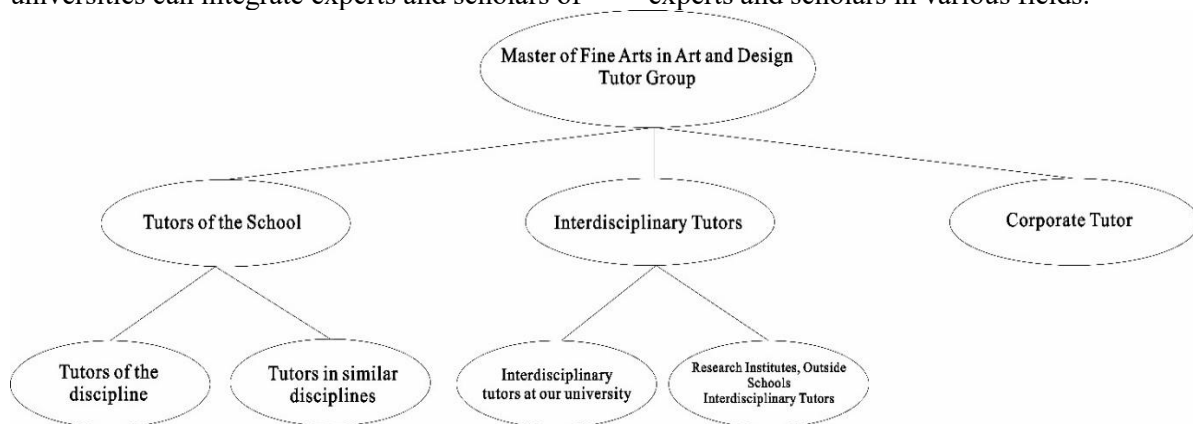


Figure 1. Composition of the Supervisory Group of the Master's Degree Program in Art and Design of Weapon Aesthetics

2.3.2 Cultivation by off-campus interdisciplinary joint tutorial groups

Given the limited academic and scientific research resources within universities, while research institutes have a large number of scientific research projects and sufficient scientific research funds, but the enrollment scale lags behind that of universities, and some tutors are unable to recruit students to assist in completing scientific research.^[8] In Xi'an, where military and industrial research institutes are scattered, there is a strong geographical advantage, and universities can interconnect with military and industrial research institutes to build a tutor group model for training graduate students driven by scientific research projects, and improve graduate education under the aesthetics of weaponry. Under this cultivation mode, the sharing of resources between universities and research institutes can be realized, which will produce great synergy.

2.3.3 School-Enterprise collaboration tutor group cultivation model

Under the new form, in order to accelerate the combination of theoretical research and practical level, improve the practical ability of master of art design, and also to improve the application ability under the condition of weapon aesthetics, we can select the enterprises related to weapon aesthetics design with certain scientific research ability in a targeted way, and select the experts with high practical ability, strong scientific research ability and high rate of

transformation of achievements as the master of art design. The master's degree students shall be supervised by experts with high practical operation ability and high scientific research ability and high achievement transformation. After finishing the theoretical courses, the master's degree students will practice with the external supervisors, so as to realize the relative connection between the theories learned and the actual production. Under these conditions, the industry should give full play to its guiding role in the cultivation of talents, the cultivation standards and the teaching reform of colleges and universities, and encourage the industry and enterprises to participate in the cultivation of postgraduates, so as to realize the postgraduate cultivation mode of industry-academia fusion.

2.3.4 Tutor group model implementation process

At the early stage of the establishment of the tutor group, the members of the tutor group hold a symposium with the graduate students to formulate the training plan for the coming academic year and the milestones for each semester with the students in view of the professional requirements of the aesthetic design of weaponry. At the end of the academic year, a meeting of the tutor group is organized to summarize the students' learning status and arrange the students' next scientific research and learning tasks. In the process of study, the first tutor should always keep close contact with the students, understand the students' dynamics,

adjust the students' study direction in time and solve the difficulties in the study. The enterprise tutor leads the students to study in depth in the enterprise, to understand the industry dynamics, to promote learning by production, so that the content of the study is combined with the cutting-edge production. In the process of in-depth industrial learning, a tutor group meeting is organized to evaluate the students' situation in practice and guide the students' next practice, study and research direction. The tutor group holds regular meetings every month to report and preview students' topic selection and dissertation writing, determine the best topic plan, supervise the progress of the topic, and complete the dissertation writing within the time limit. The members of the supervisory team give professional advice to the students so that they can write high-quality research papers.^[9, 10]

3. Validation of a Practical Training Model for Weapons Aesthetics

Based on the conception of the above practice training mode, the School of Arts and Media of Xi'an Technological University has implemented a new training mode for the aesthetics of weaponry on a trial basis. It has changed the traditional curriculum system which is mainly based on art design courses, integrated multiple disciplines to build a group of elective courses on weapon aesthetics, and realized the establishment of a sharing platform for the elective courses; integrated laboratories and practice bases both inside and outside the

university, and set up a practice base which is oriented to the modularization of the design ability of weapon aesthetics; and realized the establishment of the system of cross-disciplinary "tutor group". The establishment of interdisciplinary "tutor group" system has realized the improvement of the practice training mode of master's degree in art and design in three ways.

After one year of exploring the practice mode, a questionnaire was distributed to the 45 professional masters selected to evaluate the exploration of the practice mode. After the questionnaire was distributed to the 45 selected masters of art and design, the satisfaction value of the practice training mode in the group of masters of art and design majors was calculated, and the specific value is shown in Figure 2. Among the six indicators, the students' satisfaction with "improvement of practical ability" is the highest, reaching 97.78%, which indicates that in one year's study and practice, the students' practical ability has been greatly improved, and certain results have been achieved in the goal of cultivating practical professional master's degree, while the satisfaction with "comprehensive ability of the tutor group" is the lowest, and the satisfaction with "comprehensive ability of the tutor group" is the highest, reaching 97.78%. The satisfaction level of "comprehensive ability" is the lowest at 77.78%, indicating that there is a deviation in the selection of tutor group, and there is still some room for improvement in the selection of tutor group.

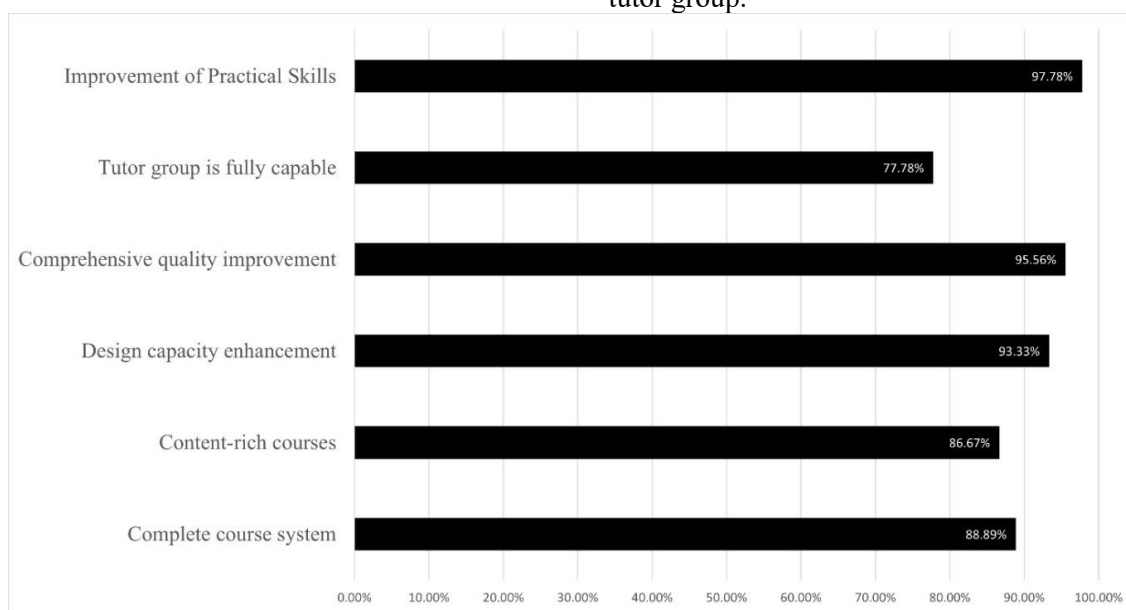


Figure 2. Satisfaction Evaluation Data

4. Conclusion

Art and design professional master's degree under the background of weapon aesthetics discipline its practical ability has some significant improvement after the improvement of cultivation mode. As a practice-oriented professional master's degree, its training mode should be different from the traditional master's degree training system. Under the background of high interdisciplinarity and large span of teaching content, we have explored the possibility of building a group of shared professional elective courses of "machinery, art, weapon system and computer" to supplement students' knowledge of aesthetic design of weaponry; modularizing the design ability and expanding the effective practice bases; and implementing the virtual interdisciplinary "tutor group" to improve the effectiveness of guidance. "These three effective cultivation modes not only improve the knowledge system of weapon aesthetics, but also increase the practical ability of professional master's degree, and cultivate weapon aesthetics design talents with the characteristics of the new era under the new form. Improving the cultivation mode of master's degree in art design and exploring the postgraduate education mode under the design of weapon aesthetics is an effective means to deepen the reform of postgraduate education cultivation mechanism and improve the quality of postgraduate cultivation.

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