Discussion of Art Engineering Theory and Thesis (Design) Process Management of Clothing Discipline—Clothing and Design Faculty as an Example

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**Abstract.** The file published by the Chinese Ministry of Education "University Undergraduate Catalog (2012)," the connotation of clothing discipline was explained. Meanwhile, on the basis of the theory of the art engineering discipline conventionally proposed, combined with the new catalog clothing related disciplines settings to Clothing and Design Faculty of Minjiang University. Several important process management issues of the clothing disciplines thesis (design) were presented, and problem-solving methods were proposed.

**Introduction**

In the disciplines of practice and disciplinary reform, the only way was to continuing to promote theoretical innovation and building an innovative professional discipline, and then formed the system and the scientific practice of discipline development and specialty construction. Usually, subjects showed category attribute knowledge, emphasizing where the home discipline of the scientific knowledge. Discipline development was the basic unit based on the division of labor and the social and professional disciplines and determining the personnel training programs. Higher education was the essence of a professional education, students accepted a certain professional training, obtained a particular subject or several subjects related to knowledge and ability, and to find in the social division of labor for their own career easily, so colleges training was full of professional property [1].

September 2012, after more than two preparation years, the Chinese Ministry of Education officially promulgated the new "University Undergraduate Catalog (2012)." By consolidating, merger, renaming, splitting, revocation, and etc. [2]. The new catalog of disciplines was from the 11 original to 12 now, adding the art category; professional category increased from 73 to 92; the original 635 professional species reduced to 506 kinds, including 352 kinds of basic professional and 154 kinds of ad hoc professional.

Based on the "Degree-Granting and Personnel Training Discipline Catalog (2011)", which was practiced by Chinese Ministry of Education from March 2011, and the new version related professional settings of the clothing professional catalog that was launched in September 2012, according to art engineering discipline theory of conventionally proposed by professor Chen DS, took Design and Clothing Faculty of Minjiang University for a example, raised process management problems of clothing discipline thesis (design), and give some suggestions.

**The Art Engineering Discipline**

**The Background of Art Engineering Discipline**

With the development of science and technology and the human society, the theoretical system construction and construction disciplines were quietly changing. After the 18th century, natural science was differentiated from philosophy, which was in turn differentiated into different disciplines, such as mechanics, physics, chemistry, astronomy, and so on. If the power of the Renaissance way was to develop sailing, the road to power the Industrial Revolution was to develop
the train, then the road to power was the development of creative industries as an important symbol of the 21st century. 18th century artistic disciplines were established, 19th century engineering disciplines was produced, and in the 20th century there was a composite discipline of art and engineering.

The Chinese Ministry of Education promulgated in March 2011 and began to implement the new version of "Degree-Granting And Personnel Training Discipline Catalog", which was first put forward a clear view that design professional may grant art degree or award a degree in engineering. The "design science" was the code 1305 for it, compared with the previous version of the course catalog of "design art" and "art of design" in the name of discipline which was more science.

"University Undergraduate Catalog (2012)", the professional clothing was involved in two disciplines included the art and engineering science. There was clothing design and engineering in the categories of textile engineering, which can granted a degree in engineering or the art. There was clothing and apparel design in the art and design categories classes, awarded art degree.

Integrated education "Degree-Granting Disciplines and Personnel Training Catalog (2011)" and "University Undergraduate Catalog (2012)" basic professional setting, compiled with reference to University Department of Higher Education "undergraduate catalog and professional presentation", gave the clothing and clothing related disciplines or professional tour (table 1).

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Subject Name / Professional</th>
<th>Professional Code / professional name</th>
<th>professional name ( English)</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>Textile Science and Textile Engineering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Art</td>
<td>Engineering</td>
<td>Apparel Design and Fashion Design</td>
<td>Engineering or Art</td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>08102/Fashion Design And Engineering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Science Class</td>
<td>130505/Clothing and Fashion Design</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**The Basic Concept of Art Engineering Discipline**

Generally speaking, the art engineering discipline meant a applied science which direct serviced to the creative industries and serviced in an innovative technical progress. Since its birth in the late 20th century, the art engineering had been closely associated with the global economy, the most active pan creative industries, effectively promoting the socio-economic process of globalization in industrial art and art industrialization.

Art was the basis of artistic disciplines engineering disciplines, the art engineering discipline was the industrialization of applied art and technology. Art Engineering (especially the design school) discipline, it was relying on this industry needed art form (such as plastic art or visual art forms), some series of creative design activity based means of engineering and technology. In general, the art of engineering in the narrow sense (sometimes referred to as the design school in the narrow sense), mainly referred to some kind of visualization which could target products and objects, the integrated use of art, engineering and other knowledge of their products function, structure, form and packaging and etc., series of activities designed to optimize the integration of art engineering [3,4].

In a narrow sense, the art engineering discipline was equivalent to the 1305 code "design study" in the discipline "Degree-Granting And Personnel Training Discipline Catalog (2011)", and as discipline Code 1305 "design study" might be marked by a degree in engineering or science award art, it had the dual attributes of art disciplines and engineering. Art engineering, engineering art, which were the basic properties of the subject. Art engineering discipline system undergraduate major included product design, industrial design, fashion and clothing design, costume design and engineering, visual communication design, public art, environmental design, digital media art, landscape architecture, digital media art, whose professional manifestation was a combination of art and technology.

733
In the "University undergraduate catalog (2012)", the code 081602 which was clearly marked as costume design and engineering, that could be granted a degree of engineering or art. There were similar situation about the code 082803 of landscape professionals. That showed that such professional had the dual attributes of art and engineering technology, engineering disciplines of art belonging to the category.

It was worth mentioned that the Chinese Ministry of Education, the 2012 edition of the professional directories, not only clothing design and engineering still had the profession, but also added the clothing and apparel design. For reference, there was no costume design and engineering in the United States CIP-2000 specialty catalog, the only features was textile science and engineering. In the CIP-2000 art class specialty catalog in 2000, in "design and applied art" subject (similar to our design school) there was a "fashion design", similarly in "Fine Art and Art" subject (similar to our Fine Art) there was "art of weaving". There was a degree granting of design degree from the “Degree Manual of Taiwan University (2005)” [5].

Inspiration New Discipline Directory

On the basic files of "Doctor and Master Degree and Postgraduate of Discipline, specialty catalog (1990), (1997)" and "Degree-Granting and Personnel Training Course Catalogue (2011)", arranged the subject changes (table 2).

| Table 2. Disciplines change profiles. |
|-------------------------------|----------------|----------------|
| Level Mathematics/number      | 72           | 88            | 110           |

Table 2 showed that, with the development progress of social and economic, the number of subjects was quietly changing, and showed an increasing trend.

Process Management of Professional Clothing Thesis (Design)

Thesis (design) teaching process was an important part of the training program in colleges and universities, which had a certain theoretical and practical value of academic papers submitted by the students before graduation. It was an initial attempt for colleges and universities students engaged in the scientific research of the system, which was an integrated presentation of the research results achieved under the guidance of instructor. Though thesis (design) of the teaching process, students to explore the unknown, to explore the scientific spirit of truth, as well as the excellent scientific quality and scientific literacy; to engage in scientific research ability. Checked students through the process of teaching thesis (design), the integrated use of the basic theory, basic knowledge and experimental techniques to address the areas of science and technology issues related to capacity; test the actual effect of the basic training of scientific research. The process was to achieve every goal to go through the stage, was the result of the steps necessary, judged the key to good or bad results [6].

The Process Management of Undergraduate Thesis (Design)

Undergraduate thesis (design) was a the practice of personnel training of comprehensive ability and quality of college students for a four-year review, the source of students of Clothing and Design Faculty came from costume science, art and the art candidates, undergraduate thesis design of clothing professional was divided into two categories, art graduation selected design, engineering students could choose anyone between graduation thesis and design, that determined the undergraduate thesis (design) management was very complex. After a long practice, the management of Clothing and Design Faculty was biased in the management process.
Develop a Timetable, Worked in an Orderly Management

Undergraduate thesis (design) was located in the general arrangements from the 7th semester to 8th semester period, in order to make the undergraduate thesis (design) in an orderly manner, faculty established a undergraduate thesis (design) working group with leadership and guidance, and set up to develop a "complete set work plan," a timetable to complete set up every aspect of the process which would be included in both tables. Faculty held some special teaching session, organized teachers to learn and research the relevant regulations and documents, and to mobilize teachers and students.

Management Thesis Topics

Clothing and Design Faculty developed in order to encourage and support mentors to undertake more research projects, and research projects would smoothly finished to ensure that students were more actively involved in research projects, enhancing students of academic ability, Faculty formulated “Clothing and Design Faculty Graduation Project Tutors Students in two-way choice provisions “and “Clothing and Design Faculty Thesis Topics Regulations”. Teachers reported a graduation project (thesis) topics and topics returned to the department submitted to the leading group of graduate design (thesis) audit after audited by the department. Announced to the students after the audit of the leading group of graduate (thesis) thesis topics, two-way choice of the students and the instructor, to determine student graduation project (thesis) subject. Then combined with the "mentoring", according to the students topics direction of thesis instructor adjusted accordingly.

Tasks Assigned

After choosing the topic, Clothing and Design Faculty required instructor in writing issued to undergraduate thesis (design), the task book which should be filled the requirements of the project completely, contained properly the basic requirements, clear tasks and key issues related to the subject.

Thesis Proposal Stage

After the task statement issued, under the guidance students needed the guidance from teachers to prepare the research report, protocols, planning program (students of design required additional drawing design renderings clothing). Now students collected and completed set of topics related to information on the topics of feasibility study, and explained its innovation and scientific and research methods and means of problem projects, demonstration methods briefly, costume design required additional source of inspiration for its elaborate costume design, and how to implement the design elements of fusion concepts.

At the same time the faculty would choose teachers to organize the students for thesis (design) proposal, checked the complete set task significance, innovation, feasibility and the research direction for guidance. Thesis defense process was needed to carry an experimental program, fashion design students needed to bring the design documents. Formed the thesis (design) proposal scores eventually.

Design, Experiments, Writing Stage

After the thesis (design) proposal, teachers guided students according to the capstone group opinions for rectification. Throughout the experiment and design phase, the guidance teachers needed a centralized guidance students graduated design every weeks, students regularly report design (thesis) work to guide teachers in progress situation, guidance teacher was resolved in a timely manner related problems raised by the students, and put forward some advice or guidance of the specific operation, also needed to carefully fill in the guidance of records to prepare the inspection institute. Guidance thesis teachers needed guided students for experimental design in detail, experimental operation and test data recording and processing, and so on, graduation design guidance teachers needed specific guidance to the students design, style design and sewing process.
**Strengthen the Medium-Term Examination Thesis**

In the academic design (thesis) process, if the student work was laissez-faire, without bundle, the quality was relatively poor. In the mid-term examination of design (thesis) process, Clothing and Design Faculty set up the time at the seven weeks or 8 weeks according to their actual situation, whose the most important part of mid-term review process was the medium-term defense which required thesis students carrying paper experimental data, graduate design students carrying design patterns, etc.. Respondent group of students design experiments and progress should be checked, once identified the experimental data was not enough or garment making with slow progress, students would be severely criticized, and instructed the instructor to strengthen guidance and inspection results documented and form mid-term examination scores.

**The Score of the Reply, the Paper Achievement Quantification**

Teaching Secretary should carry out a review of the respondent, the review which did not pass and reported to the college leading group the list and reasons. After the preliminary examination, enter the defense process. In the respondent, according to the school uniform score standard and scoring method, gave each student's answer. In accordance with the guidance of teachers, reviewers were achievement and defense score respectively by 30%, 30%, 40% of comprehensive score, draw the defense score. Respondent scores accounted for 80% of the total score of weight, mid-term examination result weight was 10%, capstone result weight was 10%, the final comprehensive performance was the student's final paper grades.

**Free Reply Attempt**

In order to train students to engage in scientific research or to take on the ability of professional and technical work better, Clothing and Design Faculty made a rule for exemption from the respondent. In formal domestic and international design competitions and other academic competition awarded who should be regarded to go through the graduation reply. Until now, a total of more than 20 students through the free defense application, this system would promote the research work of the faculty in the very positive role, implemented art engineering talents training and made the beneficial attempt.

**Existing Problems and Suggestions for Improvement**

**Selection of the Guiding Process**

The teacher-student interaction needed to be strengthened, because each tutor guided not more than 8 students, after choosing the topic, let the student make it independently. Only when students had a question they ask for the guidance of teachers. A week-guide, in this period teachers and students met each other also less time, the interaction was not enough, so the quality had a certain negative impact.

In order to improve the quality of the design (thesis) process, teachers should continue to improve their training and personal knowledge, the most important was the sense of responsibility. Also in order to regulate the guidance for topic selection process from the system, faculty required that teachers could guide according to their own research direction, or according to competition or enterprise research needs or according to the students' self study of interest to the student to select a topic for reference, so as to ensure the openness and practical topics, but also to ensure the students' initiative.

**Graduation Thesis Design Input**

After nearly a decade of development for Clothing and Design Faculty, teaching software and hardware conditions had get great improved, but there were the hardware condition of the subject of part of the laboratory or part of the professional research direction with, some had distinctive industry and scientific research funds and the condition was difficult to meet, and so on.

In view of this situation, faculty was do everything possible to raise funds to ensure design (thesis) process, laboratory area was over 14000 square meters, experimental equipment investment
was more than 1000 million yuan, and contacted with scientific research and experimental conditions of enterprises and institutions to build a cooperation platform actively, guided students to build for the design (thesis) process in the laboratory, to set for the completion of work to provide stronger protection.

**Student Attitude Problem**

Throughout the stage of design (thesis) process, most students were able to comply with the college introduced a variety of standardized system, the basic plan to complete each phase of the task. But there were a few students with lax attitude, some of the students were not punctual attendance, do not actively took the initiative to communicate with teachers, not according to the stage of completion of the task, or complete tasks extremely elaborate, complete set of poor quality.

In this regard, faculty strengthen to complete the design work of students' ideological mobilization actively, held a special meeting, arranged instructors teachers responsible for ideological work, positive guidance for students to encourage, also asked the teacher and student counselors to establish communication mechanism, jointly responsible for the students' ideological work. To be found in the problem, the parents would do a good job in the ideological work of students, so that students corrected attitude, to do a good job to complete, to ensure the completion of the quality.

At the same time, in order to encourage and support students do design (thesis) to ensure better and more excellent works, faculty introduced to outstanding students and excellent graduation thesis (Design) to give honor and reward related policies, to guide the students for a better result.

**Other Issues**

Students also had other some problems, mainly in the relatively narrow range of knowledge, thought was not quite open, on how to write the understanding was not enough, collection, collation, analysis of data and information, the lack of capacity; students graduated after arbitrarily changed the subject and title after failed to hand in change application problem, individual students graduate design worked completed in the enterprise, due to regulatory difficulties, there were others for the completion of the works the extremely individual phenomenon, a few teachers responsibility heart was not strong enough, not on time according to the requirement to complete the task, marking the seriously enough, comments were too simple, scores of discrimination was not, and so on.

In view of the above situation, the faculty made more stringent requirements:

1. To cultivate students' scientific research, innovative consciousness and ability to write scientific research papers, and actively cultivated a good academic atmosphere.
2. The Institute introduced many topics of the work system, to strengthen the audit of the paper topics and process management, to eliminate any phenomenon. And the combination of college students innovative practice projects and second classroom practice, allowing students to choose topics according to their own interests and hobbies.
3. Strengthen the student engaged in the writing of consciousness, to further strengthen the punishment for violation of the college graduates work regulations, strengthen outside engaged in graduate student management and supervision, of plagiarism, find someone to substitute for completion of the works and so on phenomenon of academic misconduct, a found severely dealt with, the implementation of one vote veto.

**Summary**

The theoretical research and construction of characteristic art engineering was very important. As a trend of discipline construction, followed by the law of cultivating subject professional development regularity and talent based, further deepening the understanding of art engineering discipline development theory and law of professional construction of, further integration and optimization of art and technology curriculum, gradually building art engineering characteristics of
clothing specialized teaching. Graduation design (thesis) was a very important practical teaching link before graduation. The quality of the graduates directly examined the teaching quality of a school, so needed to be taken seriously. Clothing and Design Faculty of Minjiang University had been in active exploration in recent years, the research found the design (thesis) work was a complete process of system, needed to strengthen the management of the process of a link.

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References