

# Issues on the Construction and Implementation of Interactions Design Curriculum\*

Dandan Zheng

School of Arts and Communication  
China University of Geosciences (Wuhan)  
Wuhan, China

Huawen Chen

CPC Publicity Department  
China University of Geosciences (Wuhan)  
Wuhan, China

**Abstract**—It is an urgent problem for art design departments to improve the teaching of interaction design and make the trained talents meet the realistic needs of cultural and creative industry. At present, interaction design major is faced with such difficulties as unreasonable course structure, single teaching mode, disordered course sequence arrangement and lack of learning atmosphere of art design. In this paper, it is pointed out that art design departments should strengthen curriculum construction, promote close cooperation between interaction design major and other majors, expand school-enterprise cooperation and absorb advanced teaching experience extensively.

**Keywords:** *interaction design, curriculum construction, teaching method*

## I. INTRODUCTION

The development of science and technology drives the reform of design field, and the demand of market industry urges the reform of design personnel training in universities. At the end of the 20th century, the field of modern art design gave birth to a new design profession — information interaction design. The new design profession is unique in that it "borrows from the theories and techniques of traditional design, usability, and engineering disciplines, but it is not the sum of its parts; it has its own methods and practices". [1] In recent years, many colleges and universities in China have opened interactive design programs to explore the curriculum system of interactive design and train professional interaction design professionals.

However, it seems that the cultivation and output of talents in Chinese universities are far from meeting the needs of the society, let alone guaranteeing the quality and professional quality of the exported talents. In addition to the uneven level of art college students themselves, other driving forces include the single form of traditional classroom teaching, the lack of students' initiative and innovation, the evaluation mechanism that judges students' comprehensive ability solely by scores discourages the enthusiasm of learners, and the hierarchical cultivation method that is difficult to realize. Gerhard Matthias, a professor of art at University of Kassel in Germany, pointed out the current

situation of design education in China: "China's art and design departments have morphed into for-profit enterprises, churning out batch after batch of shoddy graduates from faulty education lines." [2] Based on this, this paper discusses a series of problems, such as the training plan, curriculum structure, diversified teaching modes, and the quality of professional teachers of interaction design, with a hope to change the current teaching mode and create interactive design courses that can adapt to the globalization and at the same time have the characteristics of Chinese traditional culture, so as to cultivate more innovative and excellent design talents.

## II. PROBLEMS IN CURRICULUM CONSTRUCTION OF INTERACTION DESIGN MAJOR

*The 2012-2013 Annual Report on the Research on Talent Development in China's Cultural and Creative Industry* pointed out that 40% of practitioners in the cultural and creative industry believe that the imperfect talent training mechanism in universities is the key factor for the low quality of talents. [3] The reasons for the current situation in the teaching of interaction design major cannot be generalized. There are various reasons: objective reasons such as unreasonable course structure arrangement and single teaching model, as well as subjective reasons such as limited faculty and teaching quality to be improved. Here, the authors summarize the following four aspects:

### A. *Unreasonable curriculum structure and inadequate professional practice curriculum*

In the teaching process of art design, practice teaching has always been the focus of teaching research. From the "art workshop" in Bauhaus to today's factory practice, practice teaching has always provided the most direct and powerful teaching method for art design specialty teaching. [4] In the teaching of interaction design in China, theory courses account for a large proportion. Teachers often rely on textbooks for explanation, but practice links are seriously inadequate. It is common for students to sit in the classroom listening to "sealed book", or being absent-mindedness. Even if the students know the theory course by heart, they still can't apply it to practice and can't turn the input into the output. Indeed, the study of theoretical knowledge on the one

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\*Fund: School-level Teaching and Research Projects (Project No.: 2017A38).

hand plays an effective role in guiding practice, and on the other hand is also a key link to improve the cultural literacy of college students. Undergraduate education is to cultivate application-oriented talents, and there should be a reasonable proportion of practical courses on computer software. Software course has become an indispensable compulsory course in art design major. Learning to master relevant software is a basic requirement for students majoring in art design. [5] The undergraduate talent training plan clearly states that teachers' classroom teaching hours should be reduced, and the curriculum hours should be divided into classroom teaching hours, scientific research practice hours and quality development hours to guide students to study independently.

The teaching of interaction design focuses on the practicality of courses and the interdisciplinary nature of subjects. This is especially applicable to design courses in the direction of interaction design in universities. Under the background of China Internet +, the discipline of interaction design has corresponding software application methods and skills, and more teaching time should be applied in practice. If students cannot master the operation skills of software and hardware, it will be fatal to the study of other courses and the final products of the major. Courses such as *Introduction to Art* and *Appreciation of Fine Arts* should not be professional minor courses, but should be general elective courses. Major courses and minor courses should also give consideration to the theoretical part and the practical part. Courses such as *User Experience*, *User Research*, *Information Architecture* and *Interaction Design Method* are not theoretical knowledge explained in class, but should be integrated into the practical part. For example, in the training plan of digital media art major of Huazhong University of Science and Technology, there are a large number of courses that are not related to the major, such as principles of urban planning, *Introduction to the Science of Human Settlements*, *Architectural Decoration Construction*. In addition, the same is true for the elective courses, such as *Urban Design*, *Garden Botany*, and *Study on Construction*, etc. With so many courses in environmental planning for digital media majors, it is obvious that the course structure is unreasonable.

#### *B. The teaching mode is single and there is no systematic practice teaching system*

Under the teaching mode of flipped classroom, students can learn knowledge with the help of pre-class micro-videos or other teaching resources. "Flipped classroom is a hot spot in current classroom reform. One of the difficulties of flipped classroom is to ensure students' continuous learning at home and other unsupervised conditions". [6] This teaching mode is just in its infancy in some colleges and universities, but it is enough to prove that mobile learning, online and offline teaching mode is an effective measure to comply with the current information teaching. It can enhance the learning effect, and improve students' self-learning ability and cooperation ability. In the classroom, the teacher can extract the key points and difficult points more effectively, and the students cooperate to discuss to improve tutoring. The teaching based on students' self-study can be realized, and

teachers can be liberated from the traditional step-by-step explanation, operation demonstration and other modes, so as to improve the classroom efficiency. For example, *Computer-aided Design* is a 48-hour course that involves two software programs: Photoshop and illustrator. In the first half of last year, the teaching method of flipped classroom was not implemented. During the class, the authors found that the students' software foundation was uneven, and the lecture was also very boring. Some students even never opened the software, while some students could draw some simple pictures. Only 48 hours will never complete the process from recognition to proficiency in operating software. "The NSCAD University in Canada also has a flipped classroom for computer-aided design. Before class, students need to master basic computer application knowledge and learn the advantages of flipped classroom. Classroom teaching should not be too detailed, but should focus on cultivating students' habit of active learning and improving students' ability to solve problems." [7]

In addition, besides explaining the operation and application of the software, the class time also involves some basic interaction design direction of product design, and the difficulty coefficient can be seen. Finally, due to time constraints, the work is also relatively rough. If students follow online videos for self-study in advance, teachers can pay attention to practical teaching and emphasize students' ability to solve practical problems by themselves, students' initiative and enthusiasm for learning can be fully mobilized. In class, teachers can discuss current hot topics in combination with classroom content. The students communicated with each other and then sent representatives to the stage. Each student has a different level of knowledge, so the ways to solve and elaborate problems will be diverse and profound. Students as audience will also unconsciously think about whether they will answer in such a way or what level of knowledge they are in. Then the teaching effect will be completely different.

#### *C. The sequence of courses is arranged in a disorderly way, which results in the waste of teaching resources*

Previously, interaction design and digital animation courses belong to the same major, but they were constructed separately. Teachers in interaction design failed to communicate with other teachers, thus they also imparted the contents that should have been placed in the front of the course. The content of interactive design was not well connected in width and depth, which caused students to repeatedly learn some professional knowledge and caused a waste of teaching resources. As Professor Xia Yanjing of Nanjing University of the Arts pointed out, "It is not the specific course content selection and organization, or the design of a certain teaching method and learning method, but the grasp of various courses and the combination of various components of the course content, that is, the organization of the course structure". [8] The course structure and course sequence of the training program of interaction design major in a university are chaotic. There is a big dispute about the order of the course arrangement of *Interactive Interface Design*, such as whether *User Research*, *Interaction and*

Experience, Information Architecture and Interaction Design Method should be arranged before Interactive Interface Design.

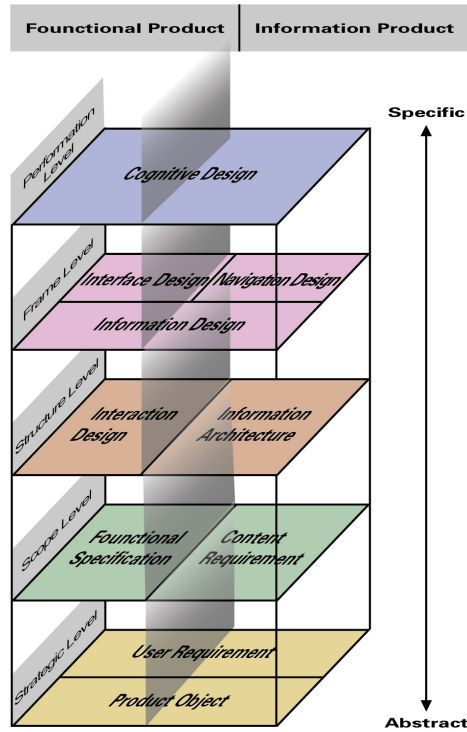


Fig. 1. Five elements of user experience.

This is very clearly illustrated in "Fig. 1". Next comes the fourth layer of framework: interface design, navigation design, and information design. A large number of requirements began to emerge in the conceptual layer of the structure, all from the strategic goals. This shows that *Interactive Interface Design* should be arranged after these courses, the product information architecture and interaction design methods should be planned first, and then the prototype of the interface should be drawn. Project planning is an art that requires foresight and the ability to think along parallel timelines. Tasks that need to be undertaken during the user experience design process need to be simultaneously or nested in other tasks. User research, stakeholder analysis, user modeling and other activities can be overlapped in most projects. It is a good idea to identify tasks that will delay a project if they are not completed on time. For example, the first course to be learned should be *User Research*, which defines users' needs, functions and design points of the system. The following is *Interaction and Experience*, which runs through the whole process of the project and can be arranged in the course of the second year of college. Later, it is to explore the method of using user experience to develop products through specific projects. Then there is *Information Architecture and Interaction Design Methods*, which must

precede *Interactive Interface Design*. The information structure here is the information architecture, so it's very clear.

D. Some art departments lack learning atmosphere for art design

When colleges and universities that offer art design programs in China receive "new archaeological discoveries, new cultural trends of thought, new aesthetic tastes, new teaching methods, including students' new ways of thinking and their vision of the world, they will timely feedback and enrich the curriculum construction". [9] Each major has its own unique charm, and can arouse the resonance of the audience. The artistic atmosphere can also be called artistic sentiment. "The Art Institute of Portland, located in the city, does not have a large architectural group, but has excellent hardware facilities, including numerous Apple series and PC series computer LABS. In addition, all kinds of animation laboratories, film and television laboratories, studios, recording studios and multifunctional halls are available. The exhibition hall of the college has a long history, with a collection of outstanding works since 1902 and a long history of cultural deposits." [10] At present, some art schools lack this professional atmosphere. Students majoring in interaction design are still addicted to traditional easel painting in their sophomore and junior years, and the computer-related courses they have learned are abandoned. The aesthetic skills and aesthetic views of painting cannot be applied to design practice, which ultimately fails to reach the goal of cultivating design professionals in colleges and universities. There are two reasons: first, the hardware facilities are not in place. It's too early to talk about a professional atmosphere without the equipment for a new major in interaction design. The second is the change of students' thinking concept, which should be more important. Schools should gradually guide students to engage in relevant professional studios, lead them to do some research projects, conduct some practice and exploration so as to arouse their interest. The most representative feature of SID change is the "studio" teaching system for junior and senior students. Each studio is based on the industrial clusters in the Pearl River Delta, and combines with the accumulated experience, research interests and professional expertise of teachers in the past long-term teaching. [11] Guangzhou Academy of Fine Arts started earlier and achieved more in the major of interaction design. They divided the four-year undergraduate teaching tasks into two stages: basic design teaching stage and professional studio teaching stage. It can be seen from this that these studios drive the organization and implementation of teaching and scientific research subject with the teaching concept of "research system", and regard "acts appropriately to the situation" as the indicator of setting up subject by themselves and setting up subject by industry cooperation.

### III. COUNTERMEASURES AND SUGGESTIONS TO SOLVE THE PROBLEM OF CURRICULUM CONSTRUCTION OF INTERACTION DESIGN MAJOR

Above, the authors listed the deficiencies in the teaching of interaction design major and analyzed the causes of the problems. Here, the authors proposed the following countermeasures and suggestions to improve the above problems:

#### A. *Strengthening curriculum construction and cultivating specialized talents in applied interactive design*

"If the benign interaction between teachers and students is the foundation of 'linkage', professional construction is the basic project to better improve the quality of teaching. Curriculum construction is bound with specialty construction, which is the organizational form of curriculum, and curriculum construction is the foundation and foothold of specialty construction." [12] Last year, the undergraduate program was revised once every four years and the proportion of practical courses was adjusted. The revised training program consists of "general education courses, major subject platform courses + subject foundation courses, major professional courses, practical education courses and innovation and entrepreneurship education courses", which have a clear proportion of the curriculum system respectively. The revision made reasonable adjustments on the original basis, and the combined modules of major platforms and basic courses account for 30-40 credits. The revised training program aims to develop students' scientific thinking skills and ensure that they have a solid theoretical foundation and basic skills for future employment in the industry. In addition, the total credits of minor courses account for 20-25 credits, and the curriculum system mainly includes basic courses of professional disciplines and major courses. However, the course of layout arrangement is listed as a course of interaction design. The course of layout arrangement of graphic design is to explore a reasonable visual flow in the printed products. Is it necessary for interaction design students to learn these contents? Of course, the curtailment of the planned curriculum will inevitably affect the interests of some people, so the bad practice of setting classes for people must be eliminated. "The cultivation of creative consciousness in the curriculum construction of art design major is mainly reflected in the renewal of the system, the reorganization of the curriculum system, the establishment of the evaluation system, and the reform of the teaching system and so on." [13] At present, the interaction design major lacks mature and relatively cutting-edge teaching materials for teachers to use in lesson preparation. Teachers need to keep an eye on the dynamic development of the subject, and network information has become an important source of information, which requires teachers to be able to summarize fragmented knowledge. The reorganization of the curriculum system can retain the professional courses that reflect the characteristics of the development of the times and eliminate those that are not suitable for the development of this major. "Based on the survey data of *UXIS2012 User Experience Industry Survey Report*, it can be seen that the course system of interaction design major focuses on training interaction

designers, visual designers, user researchers, as well as front-end development engineers and animation designers." [14] The employment of interaction design major is relatively broad, and the focus of teaching should be combined with current hot spots or emerging industries, such as mobile Internet and interactive design of mobile devices, to lay a foundation for students' future employment. It is impossible to predict the future employment of students, because the speed of change in the industry is faster than people's imagination. Therefore, teaching should focus on improving students' ability to apply knowledge, analyze and solve problems, and take the initiative to teach themselves. It is natural that curriculum construction becomes a priority.

#### B. *Establishing interactive professional structure based on different subject backgrounds to realize real crossover*

"Especially in the digital era, multimedia makes the study of interaction design more diversified, and the analysis of multi-cultural background and multi-disciplinary perspectives enriches interaction design theory. Cooperating with literature and history majors can give full play to the educational role of excellent traditional culture." [15] Previously, China's domestic business sector has attached importance to the core technology, sales, imitation of the trend of the concept, and ignored development, innovation, design concepts, etc., which can be clearly reflected in the salary, so there is no need for professional UI designers. However, this has a negative impact on the brand image of China's local products and the virtuous circle of the whole industry. What universities need to cultivate is a new generation of designers with modern design concepts and traditional Chinese thoughts. In addition, the theoretical research and discipline construction of interaction design major should keep close cooperation with visual design, product design, environmental art design and other design fields. Through interviews and investigations, it can be seen that MIT laboratories, Carnegie Mellon University in the United States, Technische Universiteit Delft in the Netherlands and other institutions require students to conduct multidisciplinary research in the teaching of interaction design, which can greatly improve their professional ability. At present, the universities leading in interactive design teaching in China are as follows: Academy of Arts and Design of Tsinghua University, Nanjing University of the Arts, and College of Design and Innovation of Tongji University, etc. They all emphasize close collaboration between different disciplines to achieve true crossover, and require students to read extensive literature and watch online videos to explore cutting-edge trends in future interaction design directions. At the same time, they also strengthen the close cooperation with universities around the world to jointly carry out workshops on interaction design.

"The integration of art and design education with other disciplines in comprehensive universities can be carried out in two ways: first, art design education, scientific research and practical activities with the subject of art design as the main body and other subjects as the auxiliary. Second, the discipline of art design assists the needs of other disciplines to carry out art design education and practical activities." [16]

It is necessary to meet the needs of the society and the market, to improve the awareness of teachers and students' integration and cooperation with other majors and disciplines, scientific research and social practice.

*C. Exploring a new school-enterprise cooperation model for interactive design*

It is the most important teaching objective to train application-oriented college students with employment as the purpose, and school-enterprise cooperation is an important link. "The teaching achievements of interaction design major in Guangzhou Academy of Fine Arts cannot be separated from its regional roots in south China and its unique commercial color. Studio courses are closely linked to market demand. In the process of building the interaction design studio, the cooperation platform jointly built by universities and enterprises was formed. This platform includes three main aspects: joint cultivation of school-enterprise cooperation, joint research projects of school-enterprise cooperation, and joint personnel output of school-enterprise cooperation." [17] Inspired by the teaching cases of interaction design in Guangzhou Academy of Fine Arts, the authors understand that only through close cooperation with enterprises can the types of talents needed by enterprises be known, so that the universities and colleges can achieve targeted teaching policies and objectives. With the development and popularization of the Internet, the demand for computer talents by Alibaba, Baidu, Tencent, JDcom and Netease, the five Internet giants, has directly stimulated the cultivation and output of interaction design talents in universities. For example, the cultivation of interaction experience designers, UI designers, web designers, Java development engineers, user researchers and other professionals.

On the other hand, institutions can invite managers and designers with industry experience to teach practical projects. "For design majors in colleges and universities, the fundamental purpose is to truly realize the connection between talent training and social needs through school-enterprise cooperation." [18] It is obviously difficult for a school teacher to maintain the standard of specialization in both fields, given the fine definition of employment and the standard functions of each position. Therefore, it is feasible for students to practice in enterprises. "The development of vocational education in Australia benefits from the symbiotic and shared relationship between industry, government and schools. It is necessary to establish a platform to communicate with the industry and government to define concepts, define boundaries and understand the needs of enterprises, government, and school. And figure out what all three have in common to achieve the coordinated, complementary and shared development of the three." [19] The education case of Australian universities shows that universities should strengthen the deep cooperation with the market industry and the government to develop the talent training plan combining industry, education and research, and become the "incubator" and "promoter" of local enterprises and industry innovation.

*D. Cultivating interdisciplinary talents majoring in interaction design*

The talent training programs of various universities have increased the construction of college students' independent learning ability for innovation and entrepreneurship. "The cultivation of students' academic qualifications needs the leading support of the consciousness, attitude and aggressiveness of the connotation of moral education. The development of student moral education also needs to be strengthened with the carrier of practice and innovation to enhance the actual effect." [20] Because people always emphasize that the talent training of interaction design requires both artistic and aesthetic knowledge and certain knowledge of engineering realization, so as to make things more practical. What is more critical to design is the source of inspiration thinking — humanistic thinking. However, it is not advisable for many learners to innovate for the sake of innovation and create difficulties to innovate even when there is no difficulty.

The core of scientific development concept is people first, and the key lies in the scientific development of human. "The social progress also endows talents with new connotation, that is, compound talents. Such talents have both 'knowledge' and 'spirit', and have scientific quality and humanistic quality." [21] If you want to design products with innovative thinking, you can think from the perspective of social insight — humanistic care, which is exactly a more important aspect of cultivating the knowledge structure of interaction designers. How do you understand this? This is a case and a piece of work.



Fig. 2. Happiness Counter.

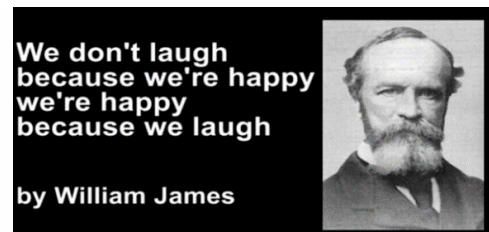


Fig. 3. The father of American psychology.

It won the 2012 GOOD DESIGN award in Japan. It's called *Happiness Counter*. (See "Fig. 2") This is a Japanese

refrigerator that automatically takes pictures when people are smiling. It is usually locked, and only when you stand in front of it and smile can it open. This is a question about the elderly. As is known to all, Japan has developed into aging society. The elderly account for 40% of the total population. These old people who live alone live a healthy life and do not need much help from others, but because of the lack of communication, they become very lonely and have no chance to laugh. This refrigerator is designed for these lonely old people. Of course, the authors believe that more people need to be paid attention to in China than in Japan, which is exactly what students majoring in interaction design should learn and strengthen. As the father of American psychology put it, "we don't laugh because we're happy we're happy because we laugh. (See "Fig. 3") because it is also an important source of inspiration for innovative design — thinking about humanistic care.

#### *E. Teachers who impart interaction designers*

"Moral quality, psychological quality, cultural quality (humanities, natural sciences, social sciences, etc.), observation, imagination, summarization and induction ability, presentation ability, comprehensive application of knowledge, innovation ability, ability to accept new things and new ideas, management ability, hands-on and practical ability, etc. are of decisive significance to the cultivation of teachers and high-level art design talents." [22] At present, the number of professional interaction design teams is small, and most of the teachers are not professionals, most of which major in graphic design, digital animation, computer science, etc., they need to constantly explore and accumulate before teaching. Teachers must be aware that in the context of Internet plus, teaching methods and roles need to change. To be specific, it is to use the advantage of modern information technology to change the traditional single teaching mode and adopt a mixed and diversified teaching mode. The teacher's task is to stimulate students' interest in learning and become the helper and promoter of students' learning. "The teaching method of Kobe Design University is as flexible and diversified as its curriculum setting. It often applies a variety of methods comprehensively in a single course, with the purpose of cultivating students with various qualities and abilities to the greatest extent. The drill focuses on building a thinking model, and its discussion fully combined with the industry context." [23] Kobe Design University focuses more on cultivating students' practical ability, making students understand that design is a creative behavior based on returning to the essence of things. In addition, teachers will invite professionals from relevant industries to answer questions and share their experiences in practical work. All these require Chinese colleges and universities to strengthen the training of teachers, attend interaction design conferences, learn about industry trends, and absorb more advanced teaching experience.

University teachers must improve their scientific research ability. "Teachers' scientific research practice ability means that teachers are familiar with the actual working standards and norms of their own professional field, can effectively apply professional knowledge and skills to scientific research

practice, solve practical problems in their own professional field, and carry out technical development and technical services to improve their ability of technological innovation." [24] It is undeniable that scientific research ability is an important indicator to measure a teacher, which can not only further improve the professional quality of teachers, but also lead students to conduct in-depth scientific research and improve students' interest and expectation in professional learning.

#### IV. CONCLUSION

In the course development, the art design major in colleges and universities not only bears the responsibility of talent training and scientific research, but also bears the social service function of activating the innovation ability of regional cultural enterprises. [25] With the development of Internet technology, it is imperative to reform the teaching model of interaction design. In the future, the professional competence and discipline background of interaction designers will be more diversified to form a teaching system of interaction and integration between disciplines. Thus students and schools are bound to put forward higher requirements for teachers.

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