

Exploring New System of China Digital Media Design Related Undergraduate Education

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ABSTRACT

In recent years, China Digital Media Design related undergraduate education has developed into great dimensions while producing a lot of problems. Now cause of rapid development, Disciplinary Location, Training Objectives and Curriculum require study. Firstly, the paper points out the scope and general process of Digital Media Design through an analysis of properties of digital media industry. Secondly, the paper studies the current status of Digital Media Design-related undergraduate education from the policy of Chinese Ministry of Education and the practice of representative universities. Through questionnaire survey of Digital Media Designers from Beijing, Shanghai and Guangzhou, the paper points out the problems of China Digital Media Design related undergraduate education. Finally, paper brings forward the right direction of new system of China Digital Media Design related undergraduate education.

Keywords: China Digital Media Design, Disciplinary Location, Training Objectives, Interdisciplinary

1. INTRODUCTION

1.1 The Background of Research

As a part of design education in China, Digital Media Design related undergraduate education develops rapidly, it is during the Chinese enlarging enrollment of university since the late 1990s. In just less than a decade, the scale of China's higher education has surpassed the United States become the world's first. [1] (see Table 1)

Table 1. Enrollment and gross enrolment ratio (GRE) of higher education in China

year	Enrollment (units: ten thousand)	GRE
1998	92.4	10.5%
2008	599	23.3%

As of 2008, there were 2263 Regular Institutions of Higher Education and 400 adult institutions of higher learning, [2] with 20.21 million students in China.[3] However, the funding for education in 2008 accounted for only 3.48% of GDP, while the United States, Japan, Korea, India, GDP investment is 4.7% ~ 7.4%.[4]

China's design education started in the 1980s, at that time the

scale is very small, probably about 10 schools. From 1995 to 2007, with the Chinese enlarging enrollment of university, a great leap forward has been made in design education, now the scale of design education is the fourth or the fifth large-scale in higher education in China. As of 2006, there are about 1200 design schools (including faculty), according to a sample survey the average enrollment is 290, so total students in school are about 1.4 million. [5]

Digital Media Art (also known as New Media Art) as a direct source of Digital Media Design, in China it began in the late 1980s to the mid-1990s. The rapid development of Chinese digital content industry brought the huge demand for Digital Media Design talents. Today in China 1230 colleges and universities have Digital Media Design-related majors, about 460,000 students.[6]

At present, Digital Media Design related undergraduate education is of missing Conception of Education and ambiguous Disciplinary Orientation due to over-rapid development and epistemological fuzziness within academia. Therefore, in the process of teaching teachers and students are of the ideological confusion. Through the study of the paper, the authors hope that this paper will be helpful for the healthy development of Digital Media Design education.

1.2 Research Methodology

Firstly, paper points out the scope of Digital Media Design

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and the general process, through an analysis of digital media industry. Through understanding about industrial properties of Digital Media Design, paper gets the composition of China Digital Media Designer's knowledge.

Secondly, the paper studies the current status of Digital Media Design-related undergraduate education from the policy of Chinese Ministry of Education and the practice of representative universities. Through questionnaire survey of Digital Media Designers from Beijing, Shanghai and Guangzhou, the paper points out the problems of China Digital Media Design related undergraduate education.

Thirdly, paper brings forward the corresponding improvement program by analyzing the problems.

2. UNDERSTANDING OF DIGITAL MEDIA DESIGN

Rise in the last century 1980's, information technology, communications technology, network-based digital media technology are the major leaps in the means of information processing of human society. After nearly 30 years of development they have significantly changed the way people live. The virtual digital world gives the people who lives in the real world a new perception, and also makes the environment for human survival fundamentally changed.

With the advent of the digital age, the concept of design, design methods and working areas of designers changed greatly. In order to adapt to the requirements of the times, the design education should go ahead. [7] Digital Media Design is the integration of science and art, construction and processing of digital media. What is the digital media? Digital media refers to information carrier which using the binary digital data as form to record, process, disseminate, access the course of events. Digital media includes Logical Media and Physical Media (display medium, storage medium and transmission medium). Logical Media is consisted of perception medium including digital text, graphics, images, sounds, video, animation and presentation medium (coding). [8]

After digital media technology completed the organic integration of scientific technology and art, Digital Media Design is formed. In China, Digital Media Design is also known as 'Multimedia Design' and 'New Media Design'. It is focused on information science and digital technology, based on the theory of mass communication. Modern art serve as a guide. Digital Media Design is comprehensive interdisciplinary which is a high degree of integration of science and art. It makes information and communication technologies applied to culture, art, business, education and management. During the design process, designers should combine design elements and technical elements to integrate information, designers should become a bridge between the user and information.

2.1 The Industrial Attribute of Digital Media Design

Digital Media Design services for the Digital Content Industry which is a synthesis between the Content Industry and the Information Industry. Digital Content Industry refers to the products or services which integrate the content of graphics, text, images, sound, etc. It covers mobile content, internet services, games, animation, audio and video, digital publishing,

digital education and training and other fields. In future, expansion of the border of digital content and services industry based on information technology will become wider and wider.

The Chinese government is strongly supporting the development of digital media industry. The Ministry of Information Industry, the Ministry of Culture and the State Administration of Radio Film and Television are main responsible departments of the Chinese government. By 2010 the output value of China's Digital Content Industry will reach 100 billion Yuan (RMB). [9]

The development of Digital Content Industry is gradually undergone a process of awareness, its definition is still a developing concept of dynamic.

Table 2. The characteristics of Digital Content Industry[10]-[11]

1	Interdisciplinary of cross-media, cross-industry
2	Emphasis on Originality and Intellectual Property
3	The dependence of science and technology

2.2 The content of Digital Media Design education

The educational content of Digital Media Design must be based on digital media division of labor as the starting point, the courses should be able to meet the needs of industrial development, grasp the direction of industrial development.

Digital Media Design work mainly concentrated on the original stage and production stage in the Digital Media Industry. Work Areas of Digital Media Designers include: electronic games, computer animation, digital audio and video, mobile Content, E-learning, Network Services, digital creative, software development etc. [12] The process of production in Digital Media Industry include: Content creation, Content Management, Content Distribution, Application Development, Operations Access, Value Chain Integration, Customer Service.[9]

We can see from the above that the content of knowledge in Digital Media Design process (see Table3).

Table 3. Content of knowledge in Digital Media Design process [13]

Stages of Work	The content of knowledge
Planning	Human psychology, marketing, Management, Understanding of multimedia ,Understanding of media, copyright
Component of in formation	organizational capacity for information, basic cultured knowledge Anthropology, sociology
Interface design	Navigation, Operation design, Kansei Engineering, Cognitive Science
Graphic& Image design	Color, Shape, Graphic, Capacity of acquisition, editing, synthesis, performance of motion image etc.
Sound design	Performance of hearing(sound, music, voice),Sound Editing
Programming	Understanding of computer, Information and communication technology ,Procedure operational capability, Database, JAVA, asp

3. DIGITAL MEDIA DESIGN RELATED UNDERGRADUATE EDUCATION IN CHINA

China's Digital Media Design undergraduate education develops from the original professional of Computer Science and Art Design since the late 1990s. In 2000 by the Beijing Broadcasting Institute (now renamed as the Communication University of China (CUC)) established the professional of digital media art for the first time. Around 2001, the Central Academy of Fine Arts, the Central Conservatory of Music, the Academy of Arts & Design of Tsinghua University, China Academy of Fine Arts, Nanjing Arts Institute and so on, these art colleges have been offering the digital media art or new media art to keep abreast of the times. Subsequently, many local universities and colleges of higher vocational follow herd. [14]As of 2007, more than 300 undergraduate universities, more than 1,000 colleges and vocational schools engaged in digital media art are in the whole of China. [6]

But so far there is no consensus of: 1. Whether or not to establish a new undergraduate major? 2. What is the name of major? 3. How to train the creative talents? [15]

This paper will study two aspects of China Digital Media Design Related Undergraduate Education:

1. The Education Policy of Chinese Ministry of Education: the enlarging enrollment of university.
2. The Educational Practice of Chinese representative institutions.

3.1 The Education Policy of Chinese Ministry of Education

Began in 1999, the enlarging enrollment of university in the leadership of Chinese Ministry of Education makes rapidly expanding of scale in higher education. Meanwhile, Chinese government funding for education investment is long-time lacking.[4] In this context, sources of funding for colleges and universities increased reliance on student tuition fees. On the other hand, the tuition fees of students in Art and design majors are 10000 Yuan (RMB) per year in general. It is nearly two times fees of students in non-art majors.[16] Therefore, colleges and universities have a strong desire to create the Digital Media Design professional direction with a good enrollment. Based on interdisciplinary nature of Digital Media Design, art schools, liberal arts colleges, engineering colleges and universities have set up this professional direction under different majors.

As China's higher education authorities, the Chinese Ministry of Education conducted a major overhaul of the Major Catalog on National Higher Education in 1998. It is the three-tier structure, the first tier is 11 subjects, the second tier is different major, the third tier is professional direction. Each year since then catalog has been done a partial amendment. This Major Catalog is the guidance when colleges and universities set up majors. For the establishment of new major colleges and universities need to be approved by the Ministry of Education.[17] As has been the vague disciplinary location of Digital Media Design, there is not major of 'Digital Media Design' on the Major Catalog. According to incomplete statistics, as of May 2009, there are about 13 majors engaged the professional direction of Digital Media Design to enroll students. (see Table 4)

Today 'Digital Media Design' is set in the subject of Literature disciplines (majors: 0503 Arts, 0504 Journalism and Communication) and the subject Engineering disciplines (0806 Electrical Information), as professional direction of many majors such as Art Design Theories, Art & Design, Animation, Creative Media, Digital Media Arts and Digital Media Technology. On the Major Catalog, 'Digital Media Arts' and 'Digital Media Technology' are closet majors with Digital Media Design. It looks like the formation of interdisciplinary development is coming. But because the school system and teacher's reasons, few schools can be truly interdisciplinary teaching. The same course in various colleges or universities often has different priorities because the teachers' understanding of Digital Media Design is dynamic and developing.

Table 4. The Digital Media Design-related majors (As of May 2009)

Subject	Year	Major Codes	Major Titles
Literature disciplines	1998	050407	Artistic Design Theories
		050408	Art & Design
		050416	photograph
		050418	Animation
		050420	Radio & Television Editing & Directing
	2004	050423W	Film and Video
J C	2003	050306W	Creative Media
Engineering disciplines	1998	080605	Computer Science & Technology
		080303	Industrial Design
	2002	080623W	Digital Media Arts
	2002	080612W	Movie and Television Art & Technology
	2005	080628S	Digital Media Technology
		080613W	Network Engineering

*** J C: Journalism and Communication

3.2 The Educational Practice of Representative Institutions

In China at present there are two kinds of representative understanding of Digital Media Design: one is the generalization of Digital Media Design. All or part of the design creative process to use digital, scientific and technological means as a manifestation those are all known as Digital Media Design. This has led to the previous industrial design, space design, graphic design have been included in the Digital Media Design. The second is direct equivalent between Digital Media Design and 'film and television animation', 'network multimedia'. [11] Both are one-sided understanding, leading to the current teaching practice chaos situation. Now we analyze the Chinese representative institutions from training objectives and the core curriculum to identify the current Chinese Digital Media Design education characteristics.

In this area, Communication University of China (CUC), Zhejiang University (ZJU), Shanghai University of Engineering

Science (SUES) have leading education system. In 2000 CUC set up the major of 'Digital Media Art' for the first time. In 2002, SUES set up 'Multimedia Design' of professional direction cooperated with Korea Dongseo University. In 2005 Zhejiang University set up 'Digital Media Technology'.

The training objective of undergraduate education reflects the perception of the degree of discipline. It is directly related to the Major Courses Set-up and the introduction of teachers. It is programmatic document undergraduate teaching to point out the direction for the cultivation of students. The above three universities are different types of universities, but the training objectives of Digital Media Design education are similar. They all emphasize the combination of art and technology, the goal is to bring up compound creative talents. This training objectives are too idealistic and lacking in operability.

By comparing the core curriculum, we can find that there are three types of the current Digital Media Design education in China: 1. focusing on the central task of Artistic Skills (CUC), 2. focusing on the central task of technical training (ZJU), 3. general piece together art courses and technical courses simply. (SUES) (see Table5) Because of lack of communication between disciplines, they all failed to carry out effective combination, this is not consistent with the characteristics of interdisciplinary of Digital Media Design. Digital media industry development needs compound talents who have the capacity of digital technology and artistic creativity at the same time.

Table 5. Core courses of representative Institutions

Unv	Core courses
CUC	Television Arts aesthetics, Western New Media Art, Art Creative Thinking, Web-based Programming, Animation motion law, Basis of visual modeling, Sculpture and 3D modeling, Digital photography and video, Clips art and practice, Film and television sound art, Principles of digital film special effects, Advertising creativity and performance, Digital synthesis, CG art, Television channels and program's complete package, New technologies of digital film and television production, Mobile TV content production, etc.
ZJU	Introduction to digital media, Basic drawing, Database principles, Basic computer network, Object-oriented programming, Video and audio signal processing, Computer graphics, Computer animation, The role of image design, Digital photography, Computer game programming, Digital media post-production, etc.
SUES	Design Basis (sketch, color, composition), Multimedia Design Basis, Computer Image Processing, Creative Engineering Design Graphic Information Processing, 3D Information Processing, 3D Image Basis, Computer Programming Language (C++) ,Interface Design, Simulation planning and Design, Interactive Design, Digital Animation Design, Virtual Reality Design, Digital Media Planning and Design etc.

The training objective of Digital Media Design should be

integration between art and technology. Undergraduate education of Digital Media Design should train the design talents who has high artistic accomplishments and strong ability to accept new technology. These design talents should be able to keep up with the pace of development of digital media industry. They will be called "Tesigner" (Techology+Designer). To piece together art courses and technical courses simply, undergraduate education of Digital Media Design cannot achieve this goal.

3.3 Analysis of questionnaires about Digital Media Design

In order to accurately grasp the current actual situation of Digital Media Design, the author preliminary made questionnaires for practitioners of the digital media industry in Beijing, Shanghai, Guangzhou where leading development of Digital Media Design in China. A total of 69 usable responses were received out of an eligible sample of 76 by internet, representing a 90.7% response rate. From valid questionnaires which have been received until now, the following conclusions can be drawn. From Fig.1 we find that most people think the creativity is most important to Digital Media Design. Second is the ability of presentation. Third is the ability of design planning and strategies.

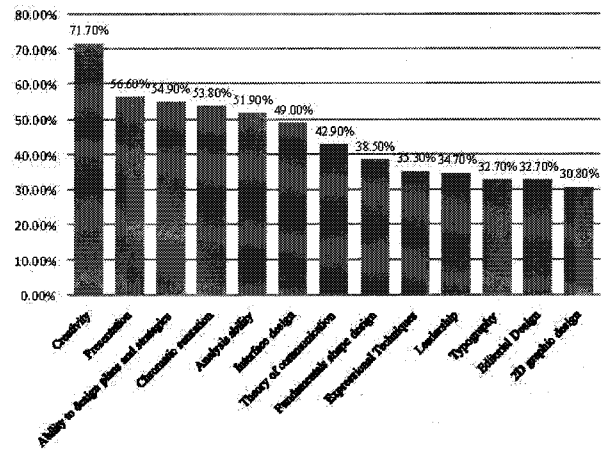


Fig. 1 the important ability in Digital Media Design

The author's multimedia design school of Shanghai University of Engineering Science (SUES) is one of earliest universities engaged in teaching and researching in Digital Media Design in Shanghai. From 2007, there has been 3 sessions of the graduates.

The author made questionnaires for graduates of Multimedia Design school of SUES. From valid questionnaires which have been received until now, the following conclusions can be

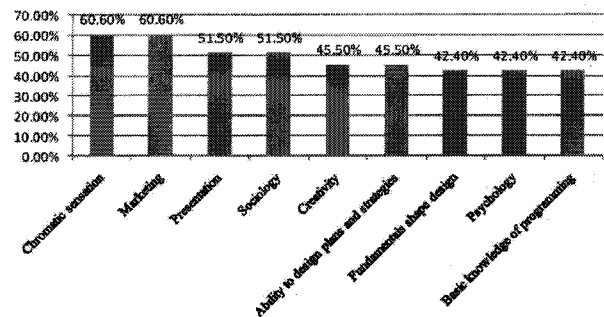


Fig. 2 Dissatisfaction related to the ability

drawn.

From Fig.2 we got the surprising result. More than 42% of the graduates expressed their dissatisfaction for their university studies because there is no access to the corresponding practical ability. Therefore, we believe that there are problems in our curriculum which is not suitable for the cultivation of students' ability.

3.4 Evaluation of China Digital Media Design Related Undergraduate Education System

Firstly, it is urgent to make in-depth understanding of Digital Media Design, disciplinary Location of Digital Media Design need to be clearly. Digital Media Design is a new art discipline, with "optical" media and electronic media as the basic language, digital technology as the core basis. Means of its performance is mainly computer graphics (CG). So Digital Media Design is a interdisciplinary field by Visual Arts, Design, computer graphic technology and media technology.[18]The category of digital media art is uncertain, it advances with the times and now mainly refers to those art with video, computers, networks, digital technology, the latest scientific and technological achievements as creative media.

The rapid development of Chinese Digital Content Industry brought the huge demand for Digital Media Design talents. The confusion is the largest characteristic of China's undergraduate education of Digital Media Design. Comprehensive universities, engineering universities and Arts Universities set up many specialties similar with Digital Media Design in the Subject level of literature, engineering, Science, such as Digital Media Arts, Digital Media Technology, Creative Media, Multimedia Design, New Media Design, etc. On one hand, it shows that Digital Media Design is interdisciplinary, on the other hand also reflects that understanding needs further deepen, teaching needs further standardization.

The establishment of the independent disciplines must start from the academic to conduct profound thinking. What are the basic principles of independence of the disciplines? What is its name and content, form and structure, connotation and denotation, ways and means, ontology and characteristics, history and development etc.? All should have a clear view. [19] Today the major name of Multimedia Design, New Media Design is popularly used in China, but their scope of theory is not sure. So these major names are incorrect. Digital media arts, digital media technology from two aspects of the arts and technology to study digital media, but author believes that interdisciplinary of digital media will be artificially separated. It is not conducive to cultivating interdisciplinary talent. Author personally thinks that the name of Digital Media Design can be a better description of the scope of the study subjects, of course, on this point also needs further study in future. Theoretical system of Digital Media Design disciplines should be included on the design theory, design criticism, design practice and design history.

Secondly, fundamental characteristic of Digital Media Design disciplines is interdisciplinary, so as to bring up compound creative talents as the goal. Digital media art is characterized by integration and interaction. It is the science, technology and the arts multidisciplinary. From Fig.1 we can find that the knowledge of Digital Media Design covers the

basic knowledge of the existing classification of human, of which the core is to enhance creativity and communication skills.

However, from Fig.2 we can find that interdisciplinary integration between art and technology, and cultivating compound creative talents need avoid mistakes. We have established the system of talents training must identify the training object's basic orientation. We cannot just general piece together art courses and technical courses simply. The unrealistically making different cognitive knowledge compressed, to give it to students is wrong. Integration does not mean mixing, complex does not mean loading. We should teach students the most essential, most profound things in disciplines, rather than the provisions of a limited few years, require students to become all-rounder with superficial knowledge. Based on their interesting the students could study cursorily many skills while specializing in just one. The curriculum system should have a professional specialty. This requires optimizing the structure of teachers, also puts forward higher requirements for academic standards of teachers. [19] Today, the university teachers should not impart knowledge into students, but should serve as a role to participate in creative learning with the students, to participate in the "creation, access, dissemination", the cycle of the process of digital content. There is a collaborative relationship between teachers and students.

Creative talents depend on talent scout, and their training should have a special way. Digital Media Design undergraduate education should make personalized teaching plan for every student, the teacher's role changes from imparting knowledge to the cultivation of ways of thinking. It is important to discover the potential of students and to guide, to provide them with the environment and atmosphere of growth. Undergraduate education should train students to have independent creative consciousness and Team-work.

Thirdly, under government's proper guidance, Chinese various Digital Media Design schools should strive to improve schooling in characteristics and to be distinct gradations. As China's education market is enormous, coupled with the current upsurge of Digital Media Design, many universities blindly offer specialty of Digital Media Design ignore the reality, where school teaching and student learning objectives are unclear. It needs Government Management by Ministry of Education. However, China's educational administration department should avoid cutting it even at one stroke in guiding the development of Digital Media Design. As an interdisciplinary Digital Media Design, comprehensive universities, engineering universities and art colleges should have their own characteristics.

In the current system of China's higher education enrollment, high school students were divided into Natural Sciences and Liberal Arts. Their knowledge is different. Generally, liberal arts students are of artistic accomplishments, Natural Sciences students are good at learning technology. The special demands of the art profession for the examinee is art examination: including sketch, color and design. But their score could be lower at the college entrance examination.

Now many candidates are not very understanding of the major to apply. But because of doing poorly in cultural course

they change to study art. So many students of good basis of art are poor in cultural qualities. They are lack of stamina. Natural Sciences students do well in cultural courses, they are good learner but lack of creative spirit and artistic talents. [20] The problems in design education are related with the admissions system to some extent. For the time being, we must insist on this recruitment pattern of integrated Liberal Arts and Natural Sciences, but more should be to reform the existing curriculum. We should respect to differences in the characteristics of Arts and Science students, teach students according to their aptitude. Author thinks it is indeed way out for Digital Media Design undergraduate education to mature.

4. CONCLUSION

China Digital Media Design related undergraduate education has developed rapidly, because of both the needs of the rational development of the digital media industry and the irrational impulse of the college expansion. The existing educational system is chaotic and unscientific. There is an urgent need to establish a new system of China Digital Media Design related undergraduate education.

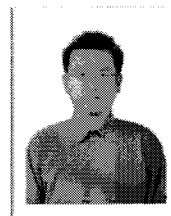
The right direction of new system of China Digital Media Design related undergraduate education is to build an interdisciplinary system. The educational system of focusing on the central task of Artistic Skills, focusing on the central task of technical training or general piece together art courses and technical courses simply is not really interdisciplinary educational system. The development of interdisciplinary education system needs to break the boundaries of relevant disciplines to conduct in-depth exchanges. The integration of science and art is core of the problem.

Therefore, in China the key to new system of Digital Media Design related undergraduate education is the establishment of interdisciplinary educational institutions and reform of enrollment system of universities.

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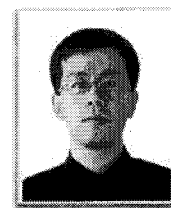
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