

Trends of Art and Design Education Development Based Interactive Metaverse Era in Universities under Liaoning Province

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Abstract: The objectives of this research were: (1) to analyze the training objectives of art and design talents, and (2) to propose the trend of art and design education development in Liaoning Province in the era of interactive metaverse. This research was a qualitative research based on content analysis and Delphi technique. The key informants were 18 experts in art design from Chinese universities. They were all experts with rich academic management and educational experience more than 10 years. The instruments used for data collection were researcher, semi-structured open interview forms, and five-point rating scale questionnaires. The statistics used for data analysis included median, mode, and Inter Quartile Range.

Keywords: Interactive Metaverse, Trends of Art and Design Education Development, Liaoning Province

1. Introduction

1.1. Background of Research

2021 is called the first year of the Metaverse. Since 2021, the concept of the Metaverse has received extremely wide attention. The COVID-19 since 2020 has played a key catalytic role in the development of the relevant technology industries and theories of the Metaverse. The era of technological transformation has further amplified the abilities of people and changed the way people produce. The change in production methods also means that the purpose of education will change accordingly, and educational reform to adapt to the changing times will be a necessary measure.

The healthy development of high-tech industries and their applications cannot be separated from policy support and control, and their application in the field of education is a continuous focus of national attention. As early as February 2019, the Central Committee of the Communist Party of China and the State Council issued China Education Modernization 2035, which clearly stated the need to accelerate education reform in the information age. The report of the 20th National Congress of the Communist Party of China in 2022 pointed out that education, technology, and talent are the fundamental and strategic support for comprehensively building a socialist modernized country, promoting the digitization of education, and building a learning society and a learning country with lifelong learning for all. We must deepen the implementation of the strategy of revitalizing the country through science and education, strengthening the country through talent, and driving development through innovation, open up new fields and tracks for development, and continuously shape new driving forces and advantages for development [1]. The Work Points of the Ministry of Education in 2022 put forward: Implement the strategic action of digital education. Strengthen demand traction, deepen integration, innovation empowerment, application driven, actively develop Internet plus education, and accelerate the digital transformation and intelligent upgrading of education [2]. This provides a policy and practical context for the emergence of the education metaverse from the perspective of national governance modernization and education digitization strategy, and also means that education intelligence and digitization have moved from technical tools and scenario practice to social context [3].

1.2. Significance of Research

Art and design education itself has some characteristics compared to other disciplines, such as emphasizing students' creativity and expressiveness, focusing on practical creation and practical experience, requiring personalized guidance and feedback, covering multiple media and interdisciplinary fields, requiring aesthetic and cultural literacy, as well as the cultivation of presentation and communication skills, and so on. Especially in the era of significant changes in social ideology in the metaverse, the demand and training objectives for art and design professionals may also shift.

Clarifying the development trend of art and design education in the new era is an objective requirement for adapting to the development of smart education in China. This research provides an effective basis for the implementation of the educational metaverse in the field of art and design, and has practical significance in rectifying the negative phenomena of "commercial traps, digital art chaos, and exaggerated metaverse gimmicks" caused by the current "metaverse". The scientific nature of the Delphi survey method gives the research results practical reference value. This research provides a theoretical background for the development of art and design education in Liaoning Province, which will contribute to the active implementation of educational reform practices.

1.3. Expected Benefits

(1) For society and the government, it is important to pay more attention to and correctly view the application of the metaverse in the field of art and design education, in order to guide government policies and social forces to support the development of art and design education in the new era.

(2) For teachers and students of art and design, conducting educational work based on training objectives and in line with development trends is conducive to responding to the demand for art and design professionals in the new era, while also providing high-level talents for society.

2. Research Methodology

This research is a qualitative research based on content analysis and Delphi technique, divided into three steps as follows:

2.1. Step 1: Conceptual Research (using content analysis methods based on relevant research)

The literature samples for this research were mainly collected through literature search databases, libraries, the internet, and other channels, including world-renowned citation index databases such as CNKI, Weip, ProQuest, Google Scholar, and SCIE. The literature research method is adopted, using professional databases as the retrieval platform to search for relevant literature within the sample range of domestic and foreign research, existing academic achievements within the scope of research content, and understand the current research status at home and abroad; Organize the collected data and analyze the literature through research methods such as simplification, screening, classification, and summarization; By inductive deduction and objective analysis and research of existing facts, reveal their development laws; By describing, explaining, and predicting, The researcher have preliminarily determined some of the "training objectives for art and design talents and their educational development trends".

2.2. Step 2: Expert Interviews and Questionnaire Surveys (Delphi expert survey method - Round 1)

Experts came from purposive sampling methods. At the beginning of the research, researcher had made preliminary invitations to 23 experienced scholars. Regardless of the effect, researcher should give experts the choice of not participating or not cooperating, and respect their choices. Through face-to-face interviews, phone calls, and email, researcher communicated with 20 professors and ultimately confirmed the key informants who voluntarily participated in the research, forming an expert group, among them, 18 experts participated in the entire process.

Expert selection should meet one of the following criteria:

(1) Art Design workers who are familiar with the concepts and theories related to the metaverse or have in-depth practice in the metaverse field;

(2) In higher education work with more than 10 years of art design education experience and associate professor title or above.

Delphi technique fully utilized the basic theories and methods of expert creative thinking, relied on expert collective, and fully utilizes the knowledge, experience, thinking, and judgment abilities of many experts.

In the round 1 of Delphi technique research, researcher conducted interviews with expert groups using an open ended interview form to obtain relevant suggestions. Then, summarized and analyzed the content of the interview, and proceeded to the second round of Delphi technique.

2.3. Step 3: Statistical Data and Data Analysis (Delphi Expert Survey Method - Round 2)

In the round 2, the researcher fed back the analysis results of the first round of Delphi interviews to the expert group, relevant concepts will be evaluated using a 5-point rating scale and experts will be asked to provide a rating and provide feedback and suggestions, and conduct statistical descriptive analysis on the data. The statistics used for data analysis included median, mode, and Inter Quartile Range.

Analyze the feedback from the second round of expert group and decide whether to conduct the 3rd round of investigation based on the actual situation.

3. The Current Problems in Art and Design Education in Universities under Liaoning Province

Due to its regional characteristics, Liaoning Province has developed well in Northeast China, but compared to first tier cities in China, both its design and educational concepts are relatively lagging behind. For a long time, teachers of art and design majors in universities in Liaoning Province have focused mainly on professional course education, neglecting the development and growth of students' comprehensive and practical abilities. In the curriculum arrangement of art and design majors in universities in Liaoning Province, practical skills related courses are mainly arranged in the internship stage of senior year, but the internship effect has not been effectively intervened, and even many students have not participated in design practice at graduation; In addition, some schools have difficulty achieving ideal results in their attempts to implement studio systems or school enterprise cooperation. This is because there are very few companies in Liaoning Province that are willing to accept internships or cooperative training, and students receive very limited practical guidance time; Lack of practical experience directly affects the design ability after entering society.

Not only in Liaoning Province, but also in terms of the current design of technical teaching modes in art and design disciplines, there is a widespread problem of unclear curriculum training objectives. The existing art and design courses still continue to use outdated educational and teaching methods, which are difficult to stimulate students' interest in learning and do not meet the current social needs [4]. Unable to meet market demand and keep up with the development pace of enterprises, resulting in a relative disconnect between the experience and ability gained from participating in practical activities in school and future work. A survey on the job destinations of several graduates shows that the lack of professional practical ability has led to most art and design graduates being unable to engage in art and design and switching careers [5].

4. The Definition, Characteristics, and Talent Cultivation Objectives of Art and Design

4.1. Definition of Art and Design

With the changing times, artistic concepts are also constantly evolving. Generally speaking, art represents human emotions and philosophical thoughts, which means that art education cannot be standardized or programmed. Art education needs to open up individual constrained thoughts, promote diversity, and respect individual differences in thinking and personal choices. Universal art education is also related to the quality education of personality development, which requires a very long process and a suitable nurturing environment. Broadly speaking, design can be understood as the entire process of expressing plans, plans, and ideas for people and things in a concrete way from ideas. Cao Xu (2020) believes that design is a special philosophical method aimed at resolving the contradictions between humans, objects, and the environment [6].

This research believes that the art and design major is a complete combination of human spiritual and material functions in the process of social development. It is a fusion discipline that complements sensibility and rationality, combines artistry and scientificity, and emphasizes both theory and practice. It relies on interdisciplinary cooperation to form a wide range of comprehensive services, and philosophical thinking is the foundation of its innovative creation.

4.2. Characteristics of Art and Design

This research believes that the art and design have three core characteristics: interdisciplinary integration is the basic feature of art and design majors, comprehensive services are the application feature of art and design majors, and innovative transformation is the core feature of art and design majors.

(1) Integrated Disciplines

Firstly, it is the integration of artistic sensibility and scientific rationality. Artistic sensibility brings inspiration to designers, and then through scientific and rational investigation, research, planning, refinement, experimentation, data, selection, and iteration, the artistic design works are gradually improved and completed. Secondly, there is the integration of ideological theory and practical skills. Art and design majors require a strong theoretical foundation, while also exercising designers' problem-solving abilities through practical skills. Design requires both hands and brains to better present the flashes of inspiration and imaginative ideas in the physical space (Cheng Xuesong, 2017) [7]. Finally, the integration of multiple disciplines requires designers to have an awareness of interdisciplinary learning, including but not limited to philosophy, anthropology, biology, behavioral science, aesthetics, sociology, art, management, marketing, and psychology.

(2) Comprehensive Services

The art and design major serves people, and its scope of service is very broad. Various aspects of modern society's material and spiritual life are related to it, from clothing, food, housing, transportation, to space, architecture, community, environment, and city. Art and design have a wide impact and change the way and quality of people's lives. The comprehensiveness of art and design services can affect many fields such as society, culture, economy, market, technology, etc. on a larger scale, and is also influenced by these fields.

(3) Innovative Creation

Art and design is a creative activity, and the rationality of creation needs to be based on philosophical thinking. For example, dialectical thinking is the core of traditional Chinese philosophical thought. Integrating and applying this idea in art and design education can help students consciously connect and unify contradictory things, promote the transformation of contradictions, and innovate into coordinated and unified new things, thereby further cultivating students' innovative thinking.

4.3. Talent Cultivation Objectives of Art and Design

Many universities set their professional goals too simply [8], and the current technical teaching mode of art and design majors generally has the problem of unclear curriculum training objectives. The existing art and design courses still continue to use outdated educational and teaching methods, which are not suitable for the current social needs. The training objectives of the art and design major are the most important basis for determining all educational structures such as curriculum design, organizational structure, and matching. This study summarizes the relevant research results of the training objectives from the perspectives of professional spirit and professional competence, as follows.

(1) Professional Spirit

Chinese Premier Li Keqiang (2016) mentioned in his government work report the need to cultivate a spirit of craftsmanship that strives for excellence; The basic connotation of the spirit of craftsmanship includes dedication, precision, focus, innovation, and other aspects. It is a broad professional spirit that includes social responsibility and service awareness. This spirit of craftsmanship is also reflected in the art and design profession, including the consciousness of originality [9], self-learning and lifelong learning, and the consciousness of inheriting and promoting tradition.

(2) Comprehensive Literacy

In the digital age, digital art and design education has gradually become an important part of art and design education in universities [10]. Liang Xiuxia (2023) believes that the comprehensive quality of art and design professionals includes both professional and humanistic qualities. Humanistic literacy may include: artistic literacy, literary literacy, historical knowledge, philosophical knowledge, folk traditional knowledge, etc [11]. Zhou Xiaoshu and Huo Kai (2023) have set the training objectives for art and design majors as follows: to cultivate art and design talents who are adaptable to the development needs of the new era industry, possess innovative and entrepreneurial abilities and cutting-edge design insights, can apply theory to design practice, and have cross disciplinary literacy (professional knowledge foundation, professional practical skills, innovative and entrepreneurial abilities, interdisciplinary knowledge system, collaborative and communication abilities) [12].

5. Conceptual Research on the Development Trends of Art and Design Education in Interactive Metaverse Era

The interactive features of Metaverse help to achieve cross temporal and spatial interaction, interdisciplinary communication, cross class communication, and cross group integration, building a safe, equal, shared, low-cost, and popular virtual reality platform. The education metaverse serves as a hub and adhesive for enhancing the connectivity and interactivity of various elements in the education ecosystem, enabling sustainable operation of all elements within the education system. The development direction of art and design education is constantly updating. Based on the research on educational philosophy and literature review on the goals and development trends of art and design education, this study found that the development direction of art and design education revolves around two dimensions: professional spirit and comprehensive literacy, with the following training objectives and development trends.

(1) Eight training objectives for art and design talents: Practical ability, Lifelong learning, Comprehensive ability, Autonomous learning ability, The ability to create, Transformation ability, The spirit of craftsmanship, Expressive ability;

(2) Eight development trends in art and design education: School enterprise cooperative education, Interest cultivation education, Interdisciplinary education, Philosophy and Ideological Education, Social responsibility education, Studio based education, Innovation and Entrepreneurship Education, Interactive enhanced education;

The development trend of art and design education has a promoting effect on the achievement of the above training objectives.

6. Expert Interviews and Questionnaire Surveys on the Development Trends of Art and Design Education in Interactive Metaverse Era

The first round of open-ended interviews was guided by the content analysis in Section 5, and the interviews were completed within 4 weeks. A total of 23 invitations were sent out through email and face-to-face communication, and 20 responses were received. 20 effective interviews were conducted (including 19 experts who provided feedback on open-ended questions via email), with a response rate of 83% and an effective rate of 100%, meeting the expected requirements.

Based on the results of the first round of questionnaire data collection, the following adjustments were made to the relevant variables in this study:

(a) Enhance innovation and entrepreneurship education → Enhance innovation practice (entrepreneurship) education: Some experts believe that modern art design education is increasingly emphasizing innovation and practice, and schools need to provide students with sufficient practical opportunities and creative space, encouraging them to be brave enough to try and constantly explore. Cultivate students innovative thinking and problem-solving abilities, enabling them to stand out in a constantly changing market environment.

(b) Enhancing social responsibility education → Enhancing social responsibility education and sustainability awareness education: Some experts believe that as society's attention to sustainability and environmental protection continues to increase, art design majors also need to cultivate students with a sense of social responsibility and sustainability awareness. Designers need to consider the impact of their works on society, environment, and culture, and strive to create more sustainable and beneficial design solutions.

(c) Enhance school enterprise cooperation education → Enhance school enterprise cooperation education (with school training objectives as the main focus): Some experts believe that we cannot blindly pursue integration with enterprises, and the academic, innovative, and cutting-edge nature of schools should be improved.

(d) Interdisciplinary (or interdisciplinary) enhancement → blurring disciplinary boundaries: Experts believe that modern art design increasingly require interdisciplinary knowledge and skills, such as AIGC technology, social sciences, design management, etc. Therefore, cultivating students interdisciplinary abilities has become crucial, as they need to possess fundamental knowledge in different fields to cope with complex and diverse design needs. To be bold, I believe that art design should consider a non disciplinary approach, which will have a significant impact on the original education system and faculty.

(e) Add the 9th trend in the development of art design education: D9 enhances the integration of digital technology: Experts believe that with the rapid development of digital technology, new tools and technologies are constantly emerging in the field of art design. Therefore, cultivating students ability to apply digital technology and innovation awareness has become crucial. Schools need to provide up-to-date teaching content to help students master the latest design tools and technologies. Or should education consider teaching students the concepts and methods of embracing new technologies, new means, and new thinking, not limited to existing paths to success.

(f) Autonomous learning ability → self-management ability: Some experts believe that self-management abilities include self-time management, self-goal management, and self-planning. Only with strong self-management abilities can one have the ability to learn independently.

(g) Add the 9th art design talent training objective: ideological quality and critical thinking ability.

(h) Add the 10th art design talent training goal: teamwork ability.

(i) Add the 11th goal of cultivating art design talents: an international perspective: Some experts believe that with the development of globalization, art design majors also increasingly need to have an international perspective and ability. Schools need to provide students with opportunities for international exchange and cooperation, helping them understand design concepts and practical methods in different cultural backgrounds, thereby expanding their horizons and ways of thinking.

Based on the results of this round of survey, the researcher designed a survey questionnaire for the second round and sent it to the experts to answer again.

7. Statistical Data and Data Analysis on the Development Trends of Art and Design Education in Interactive Metaverse Era

Table 1: Summary of the results of the second round of expert surveys.

No.	Adjustment of variables	Median	Mode	Inter Quartile Range
The Development Trends of Art Design Education				
a.	Enhancing Innovation and Entrepreneurship Education → Enhancing Innovation Practice (Entrepreneurship) Education	5	5	1
b.	Enhancing social responsibility education → Enhancing social responsibility education and sustainability awareness education	5	5	1
c.	Enhance school enterprise cooperation education → Enhance school enterprise cooperation education (with school training objectives as the main focus)	5	5	1
d.	Interdisciplinary (or interdisciplinary) enhancement → blurring disciplinary boundaries	5	5	1
e.	Add the 9th trend in the development of art design education: enhancing the integration of digital technology	5	5	1
Training Objectives for Art Design Talents				
f.	Autonomous learning ability → self-management ability	5	5	0.75
g.	Add the 9th art design talent training objective: ideological quality and critical thinking ability	5	5	0
h.	Add the 10th art design talent training goal: teamwork ability	5	5	1
i.	Add the 11th goal of cultivating art design talents: an international perspective	5	5	1

A total of 20 questionnaires were sent via email, and 18 responses were received, including 18 valid questionnaires. The response rate was 90%, and the questionnaire effectiveness rate was 100%, meeting the expected requirements. After collecting all the answers to the questionnaire, SPSS software was used to statistically analyze the results of the questionnaire, as shown in Tables 1.

For the newly added talent cultivation goals, some experts have added the connotation of an international perspective. Experts believe that the strong culture of our own nation is also an element of an international perspective, and we should not only look outward, but also dialectically reflect on ourselves.

Due to the statistical analysis of the data, both the median and mode were 5, and the interquartile range was less than 1.5, the researcher believe that the results of this round of statistics prove that the expert group has reached a consensus.

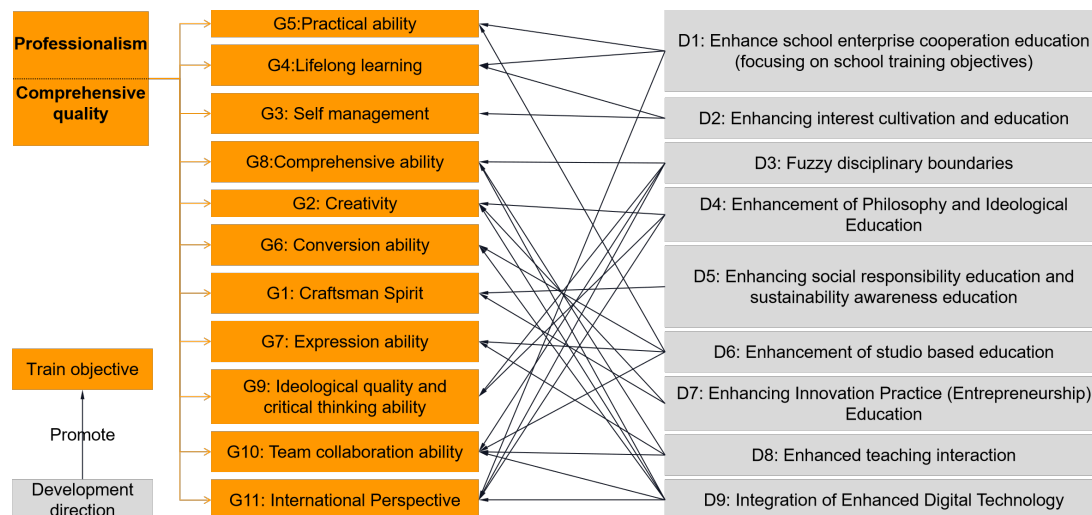
8. Conclusions

The objectives of this research were: (1) to analyze the training objectives of art and design talents, and (2) to propose the trend of art and design education development in Liaoning Province in the era of interactive metaverse.

8.1. Conclusion of Objective (1)

The cultivation of art design talents has 11 goals: G1. Craftsmanship spirit, G2. Creativity, G3. Self management ability, G4. Lifelong learning, G5. Practical ability, G6. Transformation ability, G7. Expression ability, G8. Comprehensive ability, G9. Ideological quality and critical thinking ability, G10. Teamwork ability, G11. International perspective.

8.2. Conclusion of Objective (2)



Source: Researcher.

Figure 1: Talent cultivation goals and development directions for Art Design

There are 9 trends in the development of art design education: D1. Enhancing school enterprise cooperation education (with school training objectives as the main focus), D2. Enhancing interest cultivation education, D3. Fuzzy disciplinary boundaries, D4. Enhancing philosophy and ideological education, D5. Enhance social responsibility education and sustainability awareness education, D6. Enhancing studio education, D7. Enhancing innovation practice (entrepreneurship) education, D8. Enhancing teaching interaction, D9. Enhancing the integration of digital technology.

The development trend of art and design education has a promoting effect on the achievement of the above training objectives, as shown in Figure 1.

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