A Study of the Creative Design Education In View of Convergence Design

Kun Su^{1, a}, Jin Hua Zhang^{*2, b}

¹Wuhan University of Technology School of Art and design Environmental Design Wuhan, China

²Zhejiang University School of Public Affairs Hangzhou, China

Abstract. The futurist, Daniel H. Pink, characterized the 21st century as an era of "convergence" and "perpetual". In his book, "A Whole New Mind", he proposed that we are transforming from a philosophy that emphasizes logic, order and computer efficiency to the age of innovation, empathy, and inter-disciplinary integration [1]. The integration of traditional business models, technologies, and related processes will become the driving force for next industrial revolution. Toffler & Alvin also argued in his book "The Third Wave" that with the continuous development of the knowledge and information, the partitioned societal structure will become meaningless [2]. Therefore, in the age of perceptivity that emphasizes on the integration, if the country or organization wants to take the lead, the education of integration and perceptivity in the education system will become indispensable. Abraham Maslow said that education is a process of acquiring knowledge, a means that the national and economic development depends on, and a planned change in human behavior. Therefore, developing creative future integrated designers whose minds and talents are consist with the converging markets, and who are sensitive to customers' needs in a timely manner is an important issue in the field of education today. This study attempts to investigate the current status of convergence design and its education. Based on this study, some new suggestions will be proposed on the necessity of convergence design and convergence design education.

1 Introduction

Design education in the 21st century will no longer merely only focus on the functions and aesthetic performance that improve the convenience of human life, but will also focus on cultivating the current complex and diverse social structure in responding to the upcoming unpredictable future [3]. One of the key focuses is on cultivating new creative design talents who can lead future trends. In the age of industrialization, we have always emphasized the professionalism and segmentation of information and knowledge. However, in the future development trend, we will integrate segmented disciplines, knowledge, and information. Therefore, cultivating talents with both design thinking (Design Thinking) and humanities literacy, converging the professionalism of various majors with the diversity of other fields, and improving cross-field professional capabilities, that is, creative integrated design talents, is the top priority in the field of education of the creative design [4].

In the past, independent disciplines such as product, space, and visual design, through different stages of development, have been naturally combined with management, engineering, and humanities, and connected to each other, forming a multi-field integration [5]. Famous design company IDEO's concept of 'Design thinking' has attracted significant attention in modern society. It is

believed that the creativity and innovation that lead the 21st world will be one of the keys to solving the problems that our society is facing today [6]. Therefore, convergency is the fundamental characteristics of the era. Based on imagination and creativity, we need to unify the essence of design and the direction of design education, and promotes the continuous development of design education in the future.

The focus on creative integrated design in various fields has been increasing. At this stage, there are not many integrated design education programs in the world, and the domestic curriculum for convergence design education is still in its infancy. Therefore, no matter at the academic or practical level, it is necessary for us to comprehensively think about the integration of design education, improve the execution and integration value of creative innovation, propose the development direction of design education at this stage, and enrich the necessity of creative integrated design education.

2 Theoretical background

2.1 Education

Education is a planned change of human behavior, a process of knowledge acquisition, and a means the national and economic development depends on. Education in a

^a439435180@qq.com

^b*jh900107@zju.edu.cn

broad sense is a social phenomenon unique to human society, and a social activity for cultivating people. Education in a narrow sense can be defined as a purposeful, planned, and organized transfer of knowledge and skills to the educated by educators in accordance with certain social requirements and the law of physical and mental development of the younger generation, cultivating ideological morality, and developing intelligence and physical strength. Through such activities, the educated will be trained as talents who serve the society [7].

In the West, the word of education is "training" and "pedagogy". The etymology of "education" here comes from the Latin "educate", which is a compound word of "out" and "ducare". In terms of etymology, the role of education is to bring something inside the learner to the outside. It can be seen from this that the significance of education lies in activities that reflect the potential of learners and are guided by adults or tutors.

In addition, in order to achieve the ideal educational goals, it is necessary to systematically adjust various relevant factors in the teaching process and to improve the structure of the educational environment. In order to effectively convey the content of education and integrate it with the purpose of education, it is necessary to formulate comprehensive plan activities including education methods, education operation, and education evaluation. This is just as Eisner said, 'the development of educational curriculum is a process of transforming the image and desire for education into a process', a process of concretizing the pursuit of education [8].

2.2 The necessity of convergence design

Convergence was first proposed by Professor Nicholas Negroponte of MIT at the end of 1970[9]. It refers to the effective combination of communication, spreading, and media. The interpretations of convergence in the Oxford dictionary means two folded: melting in the physical sense and in the psychological sense. It refers to different individuals or different groups after a certain collision or contact, in cognitive, emotional or attitude is integrated. Key words similar to fusion are shown in Table 1.

Table1. Convergence related vocabulary

Convergence	Chemical combination
Hybrid	A combination of outstanding features
Fusion	A wide range of mixing
Crossover	beyond the combination of types
Compound	Physical combination
Convergence	A technology or value of convergence

The 21st century is the era of knowledge-based economy [10]. The development and globalization of information technology (IT) will be the driving force for the economic growth and the wealth creation. At the same time, the development of information technology has brought about continuous optimization of the digital environment, making it an important tool for design, and playing this pivotal role as a design object. The digital

environment has positioned the central axis of design and brought new design patterns and values. This shows that design is changing from improving the human-centered visual function to a core strategy of creative innovation. As a physical element, the design concept has changed from creating a product to creating a concept of life, culture, society, and overall national life and environment. The purpose of the design has also shifted from an industrial center and an economic center to a human-centered humanized design. Through the integration of design, management, engineering, humanities and other disciplines, the convergence is to pursue the maximization of creativity, or to consider the new dimension of design creativity from both the phenomena and results [11].

In his book titled "Creative Design Decisions", Stephen J. Kirk pointed out: "Traditional designers can all exist independently, and the design thinking proposed by individuals can continue to the specific plan; however, the future design needs to cooperate from collective ideas as much as possible from each individual, and from this, come up with an optimal solution [12]. The design process will be executed by group members of different backgrounds. It can be said that this is the most suitable for dealing with the uncertain external environment at this stage and the least risk Method. Research has also shown that the degree of creativity in collaborative creativity with members has increased by 65 to 93% compared with individual creativity.

Edward O. Wilson who advocated knowledge integration also pointed out that the external crisis we are facing at this stage has a certain complex nature. The problem of diversification cannot be solved with the help of a single subject. In other words, only when different disciplines are organically combined can philosophy have the function of communicating with reality and the ability to solve various problems that may arise in human real life. The fusion of cutting-edge science and technology, culture, and sensibility will inevitably bring new services and make people truly feel the need for integration. The world's future prediction experts agree that in the near future, we will inevitably generate knowledge, develop products and create new markets through a variety of fusions. It can be seen that if we only improve our professional knowledge in a single field and do not adapt to the "fusion" of the great trend of the times, then it will be difficult to adapt to changes in the external environment.

3 convergence design education direction

Robert Maynard Hutchins, who was the fifth president of the University of Chicago, believes that in education, it is more important to hone wisdom than courses set up for employment [13]. Therefore, under the current emphasis on humanities, through humanistic design ideas, cultivating the ability to understand communication, innovation and problem solving is the basic way to achieve the goal of convergence design education. Based on the convergence trend, the creative design education is to cultivate designers with humanities, sociology, management, science, and engineering expertise and

practical capabilities [14]. It is to establish and operate interdisciplinary composite research in the future society and industry.

First of all, in the field of domestic design education at this stage, in order to meet the needs of the industry, design education is continuously improved. The education of domestic design colleges can be roughly divided into four frameworks: school cooperation, regionalization, the overall school philosophy of universities and new technologies. However, the effective development of convergence design education must be based on a solid basic education in order to exert greater value. In short, designers need to have a solid basic knowledge in their own field, and then integrate this knowledge with other fields, and ultimately exert the ability to create greater added value or create new fields. In the current education system, only the specialization and in-depth development of various disciplines first, and the combination of Technical Skill (professional knowledge, depth and breadth are important) and Soft Skill (teamwork, communication, creativity, etc.) can realize the communication with other disciplines and knowledge. Therefore, it should gradually develop from basic education to integrated education.

Second, in order to expand the training of creative integrated talents, it is also necessary to build a network that meets the requirements of an integrated education environment. Through integrated development, the establishment of integrated seminars, joint lectures, and online education in the university will lay the foundation for cultivating integrated talents. In addition, it is necessary to organize forums, seminars and lectures composed of multidisciplinary students, professors, collectives, research institutions, and policy makers to explore the understanding and specific methods of cultivating creative integrated talents.

Finally, the industries, governments, and universities who are promoting to improve the creative design education should conduct research and selection from many aspects. Differentiated design fields, marketing, engineering and other related courses can be connected with local characteristic industries and related enterprises through on-site customized education projects, and contribute to regional globalization. On-site customized education can be achieved through cross-over interdisciplinary education courses in the university education process. Based on balanced theoretical education and field-oriented courses, through credit exchange-type industry-university cooperation projects, enterprise product development projects and other practical education courses, students from different disciplines such as design, humanities, management, engineering, etc. form a team for joint implementation Project, explore design and other programs.

In the future, in order to develop and improve creative convergence design education, not only the content, methods, and specific processes of education should be carefully considered, but other factors that constitute the foundation of education must also be considered, and the goals and content of education must be viewed from a systematic perspective. However, based on the above content, we can understand that the future direction of

design education must satisfy the difference, innovation, openness, continuity, and improvement.

4 Conclusion

With the advent of the paradox of knowledge informatization, internationalization and integration, design competitiveness has become the most urgent topic in the 21st century. As a new growth driver leading the global market, the cultivation of creative integrated design talents has become an urgent requirement.

According to our country's economic structure, the demand for the creative integrated design talents is not yet large, and we still have a different view of creative integrated disciplines. Therefore, in order to explore the creative integrated designer talents internationally, a dual education structure that integrates multiple media and perceptual means is needed.

Based on the background and necessity of the creative convergence design education, this research puts forward some suggestions on the development of convergence design in order to cultivate creative integrated design talents to make up for the problems in the development of convergence design education in China. The implementation of convergence design education in China is still in its infancy. At present, integrated research that can reflect the actual situation in China is still insufficient. Moreover, it is too early to receive integrated education or the demand for integrated society talents. Therefore, the education and industry circles should continue to try and research from various perspectives on cultivating convergence design talents and education courses with the ability to build a global network. We are therefore delighted to share these articles with you.

References

1. Pink, D. H. (2006). *A whole new mind: Why right-brainers will rule the future*. Penguin.
2. Toffler, A., & Alvin, T. (1980). *The third wave* (Vol. 484). New York: Bantam books.
3. Roco, M. C., & Bainbridge, W. S. (2003). Overview converging technologies for improving human performance. In *Converging technologies for improving human performance* (pp. 1-27). Springer, Dordrecht.
4. Lourens, N. (2015). *A critique of design thinking: An interrogation into the value and values of design thinking* (Doctoral dissertation, University of Pretoria).
5. Xu, L., Qin, S., Wang, P., & Gao, J. (2019). Research Review on Artificial Intelligence Technology to Provide Design of Man-machine Interaction in Industry and Product Design. *Research Review*.
6. Tim Brown. (2008. June). *Design Thinking*. *Review of Harvard Business Review*, 86(6), 84-92.
7. Mahmoudi, S., Jafari, E., Nasrabadi, H. A., & Liaghatdar, M. J. (2012). *Holistic education: An approach for 21 century*. *International Education*

Studies, 5(2), 178-186.

8. Eisner, E. W. (1997). The promise and perils of alternative forms of data representation. *Educational researcher*, 26(6), 4-10.
9. Gordon, R. (2003). Implications of Convergence. *Digital journalism: Emerging media and the changing horizons of journalism*, 57.
10. Park, S. O. (2001). Regional innovation strategies in the knowledge-based economy. *Geo. Journal*, 53(1), 29-38.
11. Jung, J. H., & Chang, D. R. (2017). Types of creativity—Fostering multiple intelligences in design convergence talents. *Thinking Skills and Creativity*, 23, 101-111.
12. Spreckel Meyer, K. F. (1988). *Creative design decisions: a systematic approach to problem solving in architecture*. Van Nostrand Reinhold.
13. Hutchins' University: A Memoir of the University of Chicago, 1929-1950
14. National Research Council. (2014). *Convergence: facilitating transdisciplinary integration of life sciences, physical sciences, engineering, and beyond*. National Academies Press.