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Research on the Construction of Visual Design Curriculum in Vocational Colleges Based on Deep Learning

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Abstract: Under the conditions of informatization and dynamism, visual design courses in higher vocational colleges exhibit issues such as lagging progress, static nature, singularity, and cultural inadaptability, which hinder the development of design education. Under the framework of deep learning, to cultivate visual design talents with profound professional expertise, strong practical skills, and innovative thinking, reforms are necessary in areas such as course objective setting, teaching content design, teaching method innovation, learning evaluation reconstruction, teaching resource integration, and local cultural reconstruction.

Keywords: Deep learning; Higher vocational colleges; Visual design; Curriculum development

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1. Introduction

Since January 2025, Hangzhou DeepSeek Artificial Intelligence Technology Research Co., Ltd. [1] has gained significant attention. Market analysis data shows that on January 26, DeepSeek's application topped the Apple App Store for the first time, marking a new phase in the development of artificial intelligence. Vocational colleges bear the responsibility of cultivating high-quality, practically skilled talents for society. To achieve the goals of visual design courses in fostering students' advanced thinking abilities, creative thinking patterns, and cultural identity, it is essential to adhere to a people-centered approach, respect the dominant position of students, and resonate with the development of artificial intelligence and information technology, achieving an organic integration. This will truly address the various challenges under multiculturalism and creatively propose new design concepts.

literature reviehe term "deep learning" emerged and was used around 1990. In recent years, core competencies have gradually been valued, and the topic of deep learning has also become hot. Deep learning has not yet formed a clear and unified concept in the field of education [2]. Deep thinking should focus on solving complex

problems through collaborative exploration, interactive reflection, collaborative knowledge construction, and promoting metacognitive development. Gong and others believed that teaching and learning should be integrated, interactive, and iterative, processing, applying, and creating knowledge to achieve cognitive transfer. Scholar Guo emphasized that deep learning should be guided by teachers to provide students with challenging learning topics, encourage them to deeply participate in learning, adopt advanced learning methods and strategies, and ultimately promote the development of advanced knowledge and skills. Deep thinking aims to achieve the optimal integration of information processing, teacher guidance, and technical support processes, ultimately cultivating higher-order thinking. Deep learning, as an inevitable choice for teaching reform in the information age, has become an important path to promote the development of students' core competencies. Scholars such as Li believed that "deep learning refers to the learning outcomes of high-level thinking development through deep understanding of contexts, high engagement and deep immersion in challenging learning topics, acquisition of new knowledge through criticism, incorporation of new knowledge into cognitive structures, transfer of known knowledge to solve problems in new contexts" [3]. Deep learning aims to cultivate higher-order abilities, namely critical thinking, problem-solving, and innovation, which are essential qualities for innovative talents in the 21st century [4]. Deep learning has become a highly regarded research hotspot in the field of education. In 1976, Marton and Säljö from the University of Gothenburg in Sweden first proposed the concept of deep learning and shallow learning, with the core difference being the different methods of information processing [5]. Deep learning belongs to high-level active cognitive processing, while shallow learning belongs to low-level cognitive processing [6]. Deep learning is the process of establishing connections between new and old knowledge through critical thinking. Deep learning is an active learning approach aimed at understanding the meaning of knowledge. Zhang advocated for active, critical, and meaningful learning methods in deep learning. In summary, the essence of deep learning can be summarized as follows: learners actively construct knowledge systems through critical learning and reflection in real environments, and use deep information processing abilities to cope with complex challenges, thereby achieving a deep understanding of knowledge and the development of higher-order thinking [7].

2. Research methods and data analysis

This article systematically summarizes the problems existing in visual design courses in vocational colleges by integrating diverse materials such as literature, journals, magazines, books, and online resources.

The deep learning of visual design majors in vocational colleges mainly includes three aspects: deep learning of courses, majors, and abilities.

Deep learning in courses. To build a field for deep learning in courses, vocational college teachers should fully play their leading role in teaching activities, use teaching experience to create a good learning environment for courses, pay attention to course experience, focus on mobilizing students' subjective initiative in learning, emphasize classroom participation, guide students to think deeply with problems, critically learn and absorb new ideas and facts, and continuously expand their existing knowledge system. Wang *et al.* applied deep learning theory to instructional design, and the research results showed that this new teaching method not only significantly improved student satisfaction but also effectively improved academic performance. What kind of person has integrated deep learning into the teaching of ideological and political courses in universities? The improved curriculum system has successfully attracted student participation and made significant progress in values, ideology, and knowledge reserves [8].

Professional deep learning. Professional deep learning is a further extension of curriculum deep learning. Through specialized learning, students can reflect on their knowledge system and structure their course knowledge, constructing their own complete professional knowledge system.

The field of professional deep learning is jointly created by teachers, schools, society, and students themselves. In the learning process, students should start from their majors, exert their subjective initiative in learning, dissect the deeper knowledge structure of their subject areas inward, look up to the outside, pay attention to the cutting-edge knowledge and future development direction of their majors, continuously adjust their learning content and goals according to professional logic, and move towards a professional level. Comprehensive quality deep learning. The improvement of comprehensive quality is not achieved overnight, but requires years of accumulation, from externalization to internalization, and ultimately from quantitative change to qualitative change. The 3P (cause process result) model proposed by Biggs has a significant influence, which measures the effectiveness of deep learning through two dimensions: motivation and strategy. Using deep learning as a learning outcome and exploring effective teaching models to promote students' deep learning. The flipped classroom model designed by Chen *et al.* significantly improved the cognitive level of graduate students, while significantly enhancing their learning motivation and participation. Trengi *et al.* implemented the "situational learning unit" teaching method in high school classrooms and found that this model can effectively enhance student participation and promote deep learning.

In the teaching process, schools should set up real and specific environments or environments simulated by information technology. Teachers should guide students to continuously improve their abilities and enhance their learning abilities through the field formed by the environment, such as social practice, scientific research, innovation and entrepreneurship.

3. Discussion

With the rapid development of society, the public has gained a deeper understanding of visual communication, and the demand for visual communication design talents in the market has increased [9]. As the main force in cultivating visual communication design talents, vocational colleges are continuously expanding their enrollment scale to alleviate the shortage of professional talents. Although the number of students majoring in visual communication design is gradually increasing, the overall level and design ability of students are not guaranteed, and a large number of admissions have led to uneven basic levels of students, resulting in a continuous decline in the quality of professional teaching. The problems in visual design courses under the background of deep learning are specifically reflected in the following aspects:

The course content is disconnected from industry practice and lags behind significantly. Under the background of deep learning, the concepts and methods of visual design courses have undergone earth-shaking changes. The emergence of new communication platforms, content, and media requires practitioners to not only have the ability to use graphic editing tools such as text, graphics, and images to create flat digital content, but also to have the ability to apply media editing tools such as audio, video, 3D animation, and animation effects for cross-media integration. The traditional professional course teaching of visual communication design focuses too much on software operation and skill training, neglects the cultivation of students' thinking, and fails to timely respond to the changes in talent demand caused by industry development, resulting in an obvious lag. In the course teaching activities, the logical explanation of design concepts is not deep enough to guide students to understand the shortcomings of visual design from a cultural and theoretical perspective. Some

courses still focus on traditional graphic design, with the main focus on designing posters, brochures, and other graphic materials. In the explanation of "Interface Design" class, there is little involvement in multi-terminal adaptation, such as dynamic interactive effects, in car systems, and smart device interfaces, and more emphasis is placed on static interfaces of mobile apps, which is no longer in line with the development trend of the times.

Lack of innovation in teaching methods and technological means, with a prominent static nature. In the era of big data, deep learning thinking has penetrated into various industries and fields of society. In many professional fields, technologies such as big data, artificial intelligence, VR, etc., have been applied to various aspects of teaching. However, in terms of teaching methods and means, some teachers in the field of visual communication design still suffer from "ability crisis" and "ability panic." Their thinking is not liberated, and their thinking is not innovative. Teaching is mainly based on traditional lectures, and there are few new technological methods based on big data, artificial intelligence, augmented reality, virtual reality, etc.; At the same time, the technology lags behind, the use of AI and other intelligent design tools is limited, the information technology teaching environment is insufficient, and the deep integration of information technology and classroom teaching is not enough. Many students still rely on software such as Photoshop to complete designs, and do not understand the technology of using AI artificial materials and new software commonly used in the industry to complete designs. The graduates cultivated under this mode are no longer suitable for the working environment of enterprises that use new technologies, and the talent cultivation of schools is disconnected from the needs of enterprises.

There are professional barriers and an obvious singularity in the curriculum design. In the context of deep learning, cross-border and integrated thinking has become one of the mainstream trends in the field of art and design. With the development of the times, the boundaries of art and design are becoming increasingly blurred. But the reality is that the division of art and design majors in modern vocational education is becoming increasingly detailed, and the curriculum is becoming more and more specialized. This curriculum concept is contrary to the "general education" proposed in university philosophy, and the knowledge system under a single professional background may hinder the cultivation of students' design thinking. To solidify students' design thinking foundation, highlight innovative themes, promote visual communication design students to master solid art and design theory knowledge and skills, and become familiar with and master new technological means, it is necessary to put effort into curriculum design, take the path of "multi cross integration," construct the curriculum system from the perspective of professional group and multi professional integration, and achieve cross-border integration of design and technology, design and information technology, and design and business.

The integration of ethnic culture into the curriculum system is lacking, and cultural adaptation is evident. Ethnic culture is a culture created and developed by various ethnic groups in long-term social practice, with its own form and characteristics. It is a reflection of the political and economic ideology of a certain society. Ethnic culture related courses account for a small proportion in the visual design curriculum system; In the course content, the introduction of ethnic culture is still superficial and superficial, without delving deeply into the rich connotations of ethnic culture, enriching students' thinking, and enhancing their sense of national pride; At the same time, the visual design curriculum is closely linked with cultural anthropology, ethnology, history, sociology and other disciplines. Especially in the context of the "Belt and Road" initiative, it is more important to emphasize nationality. However, the current visual design teaching system lacks interdisciplinary education concepts and methods, which limits the improvement of students' design thinking and innovation ability.

In the context of multiculturalism, visual design courses need to integrate cross-cultural concepts, update teaching content and methods, in order to cultivate talents with a global perspective and inclusive

design abilities. Accurately positioning course objectives. The course objectives are the direction of course construction. To achieve the course objectives under the concept of deep learning, it is necessary to accurately position them from the perspectives of concepts, knowledge, and skills. Students not only need to be familiar with traditional basic knowledge, such as layout design, graphic composition, and color theory, but also master conventional design software and the direction of professional development. More importantly, from a conceptual perspective, we must fully recognize the forward-looking and important nature of visual design courses. At the knowledge level, we must keep up with the times and innovate teaching methods. As an important way to cultivate innovation ability, "deep learning emphasizes critical acceptance and reshaping of connections based on understanding, thereby developing innovation ability" [10].

One is to be problem-oriented and adopt heuristic teaching methods, "not angry, not excited, not depressed," to guide students in exploratory learning. Teachers throw open-ended questions in class, such as "How to design an H5 poster with Chongqing identification during National Day or major time periods," organize student group research, carry out design, showcase design works for discussion, guide students to propose solutions to existing problems, and stimulate students' subjective initiative and independent problem-solving ability. The second is to focus on the application of the case teaching method. Select globally influential brands, such as Huawei and Toyota, as in-depth cases to observe and analyze the characteristics of the times, such as logo modifications and visual packaging updates, from product startups to current stages. Analyze the characteristics of social development and market changes reflected in visual products, guide students to immerse themselves in the strategic considerations of well-known brands, design style transformations, and other changes, learn from experience and lessons, and use them to improve themselves. The third is to focus on iterative design teaching practice. Adapting to the high-speed and dynamic characteristics of information dissemination in the new era, adopting an iterative development model, quickly building visual prototypes, adjusting immediately according to user feedback, and improving design maturity through multiple rounds of polishing and dynamic optimization.

Refactoring the learning evaluation system. One is to put people first and emphasize process evaluation. In visual design teaching, students' growth trajectories in learning are comprehensively recorded. By understanding students' speech during discussion, data collection before design, design prototypes, and the quality of modified works, students' growth and progress are fully encouraged, and their shortcomings are pointed out to fully stimulate their sense of achievement and guide them to continue to improve. The second is the in-depth evaluation of works, abandoning the traditional evaluation criteria that focus on visual aesthetics. When examining student works, cultural background is the basic consideration, with a focus on examining factors such as creativity, uniqueness of design, and potential social value. When evaluating the design and production of a public welfare video, it is not only important to consider the design creativity and visual quality, but also to pay attention to its cultural significance, whether it can tell a good story, trigger emotional resonance among the audience, and gain cultural recognition. Thirdly, guided by practical experience, make good use of the workplace evaluation model. Vocational college students quickly adapt to the workplace environment upon entering society, and it is necessary to introduce a workplace evaluation model during the learning stage. In the design and production of visual works, market demand should be guided, and enterprise designers can be hired to participate in student academic evaluation and assessment. Suggestions can be made from a practical perspective in the workplace market to help students adapt to the workplace mode in advance and enhance their competitiveness in entering the workplace.

Effectively integrate teaching resources. One is to systematically create an exclusive learning platform,

which gathers high-quality audio-visual materials, the latest design software tutorials, cutting-edge excellent works, and other content to enrich students' learning materials; At the same time, strengthen online education and make good use of tools such as AI and DeepSeek to more efficiently inspire thinking and transmit knowledge. Secondly, specialized laboratory facilities should be equipped. Keeping up with the latest technological means, updating laboratory hardware in a timely manner, such as equipping digital painting, VR/AR experience, 3D printing, etc. Through the laboratory, students can intuitively experience the design details of works, optimize design schemes, and improve the quality of works. The third is to expand resources through cooperation. Establish deep cooperative relationships with advertising companies, well-known design firms, and gain a real-time understanding of market demand through physical means; Arrange students to intern at advertising and design companies, accumulate frontline experience, experience market changes, and seize development opportunities; Invite senior designers to enter the campus and teach students face-to-face through lectures, discussions, practical guidance, and other methods, forming a positive interaction.

Continuously adjusting cultural identity. The more national it is, the more global it is. In the context of multiculturalism, schools should attach great importance to the role of culture in visual design, guide students to learn about the excellent traditional culture of the Chinese nation and the cultural characteristics of the socialist stage with Chinese characteristics in the new era, integrate cultural elements rich in Chinese characteristics into visual design to enhance the national identity of works, continuously enhance national confidence and pride in design activities, and strengthen Chinese cultural identity. At the same time, drawing on the excellent cultures of other countries for my own use, we aim to enhance the global appeal of our design works.

4. Conclusion

This study systematically explores the application of deep learning concepts in the construction of visual design courses in vocational colleges. It analyzes the problems of lagging, static, singular, and cultural unsuitability in current courses in terms of content, methods, structure, and cultural integration, and proposes reform paths from multiple dimensions such as course objectives, teaching content, teaching methods, evaluation systems, resource integration, and cultural identity. Research has shown that curriculum reform guided by deep learning can help enhance students' critical thinking, innovation ability, and cultural identity, and is an effective way to cultivate high-quality visual design talents.

However, this study still has certain limitations, such as a limited sample size, specific teaching scenarios, insufficient systematic and in-depth exploration of deep learning theory, and incomplete evaluation of students' academic satisfaction. Future research should further expand the sample range, deepen the understanding of deep learning mechanisms, and strengthen empirical analysis and authoritative evaluation of teaching effectiveness, in order to continuously optimize the curriculum system and promote the development of vocational visual design education towards higher quality and adaptability.

Disclosure statement

The author declares no conflict of interest.

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