Research on Immersion Teaching Pathways Featuring the Empowerment of Digital Intelligence to the Aesthetic Education: A Case Study of the "Image Design" Aesthetic Education Course for College Students

Jia Chen[1], Bangcheng Zhang[*]

{chenjia@ccit.edu.cn[1], zhangbangcheng@cut.edu.cn[*]}

Changchun Institute of Technology, Changchun 130000, Jilin Province, China

Abstract: To thoroughly study and implement the guiding principles of the 20th Communist Party of China (CPC) National Congress as well as further effectively implement the aesthetic education work in schools, the Ministry of Education of the People's Republic of China issued the Notice on Comprehensively Implementing the Aesthetic Education Infiltration Action in Schools (hereinafter referred to as the Notice) in December 2023, which pioneered the comprehensive aesthetic education concept of environmental infiltration and digital intelligence empowerment. Currently, digital intelligence prevails in people's daily lives. Against this backdrop, it is undoubtedly an appropriate approach to infiltrate students' physical and mental development as well as contribute to the implementation and popularization of aesthetic education with digital technology. Indeed, everything has two sides, such as pros and cons, advantages and disadvantages. For the same reason, digital intelligence can solely play a limited auxiliary role in empowering aesthetic education courses. To veritably cultivate students' sentiments through aesthetic education and enrich their lives, the top priority is to encourage them to accumulate aesthetic theory over the long term, master skills deeply, and gain profound insights into beauty.

Keywords: Digital Intelligence; Immersion Teaching; Image Design; Aesthetic Education Course

1 Introduction

1.1 Present Situation Analysis of Aesthetic Education Environment in China

To thoroughly study and implement the guiding principles of the 20th CPC National Congress and further effectively implement the aesthetic education work in schools, as well as deepen the original intention and essence of aesthetic education courses in schools characterized by fostering students' development through aesthetic education, the Ministry of Education of the People's Republic of China issued the *Notice on Comprehensively Implementing the Aesthetic Education Infiltration Action in Schools* (hereinafter referred to as the *Notice*) on December 20, 2023, which set off the prelude to a comprehensive implementation of aesthetic education infiltration action in schools.[1] Specifically, the *Notice* emphasizes the infiltration of aesthetic

education into students, teachers, and schools to build a sustainable, comprehensive, and student-oriented aesthetic education environment. On the same note, it advocates for eight specific actions and measures encompassing deepening teaching reforms, enhancing teachers' aesthetic literacy, popularizing artistic practice activities, fostering campus aesthetic education culture, and optimizing aesthetic education evaluation mechanisms to vigorously promote the development and innovation of aesthetic education work. Moreover, it calls for strengthening organization and implementation in diverse aspects such as leadership, conditions guarantee, and publicity and promotion to effectively ensure the implementation and summary of aesthetic education work[2].

Among its guiding directives concerning the work measures, the *Notice* prospectively and innovatively proposes to empower schools' aesthetic education construction with digital technology as well as enhance the interactive experience and presentation of diverse teaching activities. Concurrently, it encourages the integration of digital technologies such as artificial intelligence (AI) and virtual reality into the teaching process, promoting innovation and reform in teaching methods. Overall, these measures are beneficial in enriching the students' immersive artistic experience, thereby improving the effectiveness of teaching and benefit evaluation. up to this day AI literacy should be brought into the framework of technical literacy system in the new era to fulfill students' demands for future study, life, and work, especially as a diversified literacy should be more and more attention[3].

China, in the new era, is bound to stand tall and firm in the East with an entirely new posture, showcasing a novel look featuring its confidence in the path, theory, system, and culture of socialism with Chinese characteristics. To this end, aesthetic education for all is the general trend and the inevitable course for national education at present. The creation of an immersion aesthetic education environment is precisely to achieve the objective of talent-oriented education, edification, enlightenment, and cultivation subtly and silently. To achieve this objective at present, it is imperative for aesthetic education teachers not only to possess correct value orientation, profound cultural background, and solid professional foundation but also to introduce pioneering patterns, and leverage cutting-edge technology and innovative capabilities. Only in this way can aesthetic education veritably exert a positive impact on the lives and psychology of contemporary young people and then be recognized and convinced by contemporary young people.

1.2 Present Situation Analysis of Digital Intelligence Development

Recently, intelligent manufacturing has been improving human physical fitness, while artificial intelligence, in turn, is encouraging the development of human brain power. As a matter of fact, Chat GPT, which has aroused people's heated discussion at present, is only the tip of an extensive digital revolution, with the hidden iceberg base furnishing solid support for this digital revolution. Essentially, digital technology not only changes people's production and management methods as well as spiritual life demands but also has been widely employed in education and teaching practice. For instance, the innovation of diversified education and teaching methods, such as online course construction, distance interactive teaching, and virtual simulation laboratories, is inseparable from the development and support of various digital technologies encompassing virtual reality, augmented reality, and artificial intelligence[4]. Though the aforementioned digital technologies all belong to the emerging computer field and

are closely related to each other, they inevitably exhibit essential differences. Particularly, their roles in innovative teaching design are quite different.

1.2.1 Virtual Reality Digital Technique

Conceptually, virtual reality (VR), translated by Qian Xuesen as "Lingjing", can be intuitively recognized as a technology that can build a virtual world similar to reality through digital modeling[5]. What users see in this virtual world does not exist in the real world. Thus, three-dimensional visual images can solely be obtained by virtue of special instruments, equipment, and environments, such as common VR glasses, or VR viewing provided by real estate software, museums, and other scenarios. While people can acquire a certain interactive experience within the VR world, its falsity and inaccessibility determine that people obtain an isolated immersive experience. Currently, a host of VR devices designed to assist the general public in activities such as watching movies, exercising, and gaming have emerged successively. In particular, some universities have integrated this technology into diverse virtual simulation case studies, such as architectural measurements and field surveys. Based on ensuring teaching effectiveness, VR technology reduces the difficulty and cost of internships while improving students' sense of participation and experience. In the future, this technology still holds extensive potential for development and utilization within the field of educational innovation, awaiting further exploration and implementation by educators.

1.2.2 Augmented Reality Digital Technique

Conceptually, augmented reality (AR) can be defined as a technology of superimposing and generating a part of virtual images based on capturing real-world objects with the help of cameras or mobile phone lenses. Meanwhile, AR technology can create a half-genuine and half-sham world in windows, thus realizing the naked-eye three-dimensional visual experience. Compared with VR technology, AR technology presents a better real-time interactive performance. Moreover, it has been widely used in a series of fields, including preschool education, film and television special effects, fitting and makeup changing software[6]. As such, the teaching software and classroom design developed by AR technology are bound to achieve immersive and entertaining results, worthy of educators' daring imagination and deep exploration.

1.2.3 Artificial Intelligence Digital Technique

The scientific encyclopedia entry of China Science Communication interprets "intelligence" as the floorboard of intelligence and capability[7]. Conceptually, "artificial intelligence" (AI) can be understood as imitated intelligence or capabilities similar to human thinking. In this regard, the theory of "multiple intelligences", set forth by Howard Gardner, divides human intelligence into eight identified categories, encompassing linguistic intelligence, logical-mathematical intelligence, spatial intelligence, musical intelligence, bodily-kinesthetic intelligence, naturalistic intelligence, interpersonal intelligence, and intrapersonal intelligence[8]. It can be seen that AI should master numerous abilities such as learning, reasoning, operation, and creation like human intelligence. Alan Turing, the ancestor of AI, designed an interesting experiment in 1950, in which a volunteer asked and answered questions with another person and a computer in the form of words to judge which side was the computer. In this experiment, 33% of the volunteers were successfully deceived by the

computer with a lying program, so the computer with this program was recognized as the first device with AI in history[9]. Along with the continuous progress of computer software and hardware technology, its computing power has been rapidly improved accordingly. Under this impetus, a myriad of AI agents, encompassing intelligent answering sound, intelligent real-time translation, intelligent home appliances, intelligent writing, intelligent painting, intelligent animation, etc., constantly refresh the world's cognition, with various traditional occupations facing unprecedented challenges.

Ethical considerations concerning digital technology are temporarily beyond the scope of this research discussion. Nevertheless, serving as an advanced auxiliary tool, it possesses the capability to provide significant convenience for educators and learners. Especially for amateur enthusiasts who intend to master certain professional skills in a short period, it furnishes a highly effective shortcut. Regarding aesthetic education, a kind of universal education, for instance, non-art major students solely need to know what it is and how to utilize it, with no need to know the underlying reasons.

2 Orientation as well as Construction Objectives of Aesthetic Education Courses: A Case Study of "Image Design" Course

As outlined above, since the establishment of the People's Republic of China, "all-round moral, intellectual, physical, and aesthetic grounding" has become the fundamental guideline for education at all stages in China, as well as a basic quality that every Chinese citizen should possess. Ever since the 20th CPC National Congress, the aesthetic education work in Chinese schools has witnessed a brand-new and substantial development. Within this context, the orientation of aesthetic education courses should not only highlight the cultivation of students' moral, intellectual, physical, and aesthetic qualities but also elevate the guidance of socialist core values, the promotion of traditional Chinese virtues, and the strengthening of cultural confidence to a new height. Meanwhile, the construction objectives of aesthetic education go beyond temporary, isolated, and superficial cultivation, emphasizing the creation of an immersive, three-dimensional, and all-round aesthetic education atmosphere. In terms of teaching methods, actual aesthetic education should focus on introducing immersive, experiential, interactive, and inclusive teaching strategies, especially advocating for the interconnected sharing of big data as well as efficient and convenient digital empowerment.

Taking the "Image Design" course as an example, unlike the training of professional artistic talents, the "Image Design" course, as a general aesthetic education course, is typically aimed at non-art major students who establish minimal understanding of artistic aesthetics, theories, and techniques. Consequently, it is undoubtedly a priority for this course to endow students with basic aesthetic cognition regarding personal image and effective personal image improvement skills within the limited teaching time. Overall, the knowledge system of this course covers not only the daily improvement of personal inner qualities and accomplishments but also the training of various skills, such as external makeup, hairstyle, clothing collocation, and wardrobe management. Concerning contemporary college students who have received higher education and laid a certain aesthetic foundation, appropriate guidance, coupled with long-term conscious training, will progressively lead to significant progress and enhancement in their internal image. On the other hand, concerning the external image, college students

need to master keen artistic aesthetic ability and strong practical operation ability to continuously improve their external image in a short time. This indeed poses a severe challenge for most non-art major students who have not received systematic training and lack practical experience.

This research aims to make the "Image Design" aesthetic education course applicable to a wide range of students from various majors, so that most students can generally understand, master, and benefit from this course. To this end, the teachers in the course group propose a teaching strategy and implementation path featuring the empowerment of digital technology to the practice of "Image Design" aesthetic education course, by seriously discussing the fundamental objective of "immersion" teaching and leveraging the performance advantages of digital technology in terms of virtual simulation and interactive experience. Through this endeavor, this research intends to effectively clarify the orientation of the aesthetic education course and promote the realization of its construction objectives.

3 Exploration of the Teaching Pathways Featuring the Empowerment of Digital Intelligence to the "Image Design" Aesthetic Education Course

Regardless of the differences in the time of emergence, background, technical route, and presentation form of digital intelligence means such as AR, VR, and AI mentioned above, we typically fully leverage their strengths and compensate for their shortcomings during software development and practical applications to achieve more desirable outcomes. Consequently, in the practice of teaching method reform and pathway exploration, it is difficult to distinguish which technical means are specifically applied in a certain teaching practice. For this reason, this research uses terms such as "digital intelligence" or "digital technology" to describe them below.

3.1 Theoretical Teaching Unit of "Diagnosis of Individual Facial Features, Colors, and Styles"

3.1.1 Content Analysis of the Teaching Unit

As the saying goes, "An individual's face reflects his or her mentality." In this regard, personal image is a systematic science that encompasses various elements such as facial features, hairstyle, and attire. Though we are East Asians with yellow skin and black eyes, everyone is born with different facial features, proportions, skin colors, and styles under the influence of their respective genes. From the perspective of image aesthetics, facial features, and proportions correspond to diverse aesthetic standards. As an example, the classic oval face, along with facial proportions characterized by "three vertical divisions and five horizontal divisions of the head," is recognized as the most harmonious visual beauty across different cultures and historical periods. Meanwhile, distinctive facial features such as cone faces and baby faces also prevailed in certain periods. Yet, people are bound to recognize the classic aesthetic standards after experiencing aesthetic fatigue. Moreover, people usually comment on other people's appearances more casually while paying little attention to the establishment of their external image. The reason lies in that we predominantly focus on observing the external

world, rarely consciously standing in front of a mirror to evaluate our appearance. Consequently, personal image design should begin with self-awareness.

The teaching focus of this unit can be summarized as the diagnosis of personal facial features, colors, and styles.

3.1.2 Student Analysis

Typically, the teaching targets of aesthetic education are non-art major students who have no artistic theoretical foundation and practical training. Compared with art major students, they lack basic art knowledge and sensitivity, including cold and warm tones, straight and curved lines, and proportional adjustments. Hence, teachers need to integrate more case analysis and live demonstrations during theoretical teaching, supplemented by more teaching tools, thereby improving the scientificity and accuracy of students' analysis and diagnosis of their personal image.

The teaching difficulties of this unit can be summarized as self-awareness and personal image system diagnosis.

3.1.3 Digital Intelligence Empowerment

In response to various issues observed among students, such as insufficient self-image awareness as well as lack of knowledge reserve related to personal image diagnosis, the course team introduced a digital tool entitled YOCHUR AI Outfit Analysis into the teaching of this unit, which is a WeChat mini-program developed by Chengdu YOCHUR Times Technology Co., Ltd. Users can take or upload a personal "face photo" on the start page of the mini-program, followed by a prompt message of "please enter and verify information for AI algorithm optimization" after confirmation. On this page, users need to manually input personal information such as gender, age, height, weight, and so on. Subsequently, users can click "Start Depth Detection" to connect to the page "Face Algorithm Analysis." At this step, the mini-program will calculate and analyze the proportions, shapes, and linearity of facial features in the uploaded photo. Eventually, users can view the real-time calculation process and statistical results, as depicted in Figure 1.
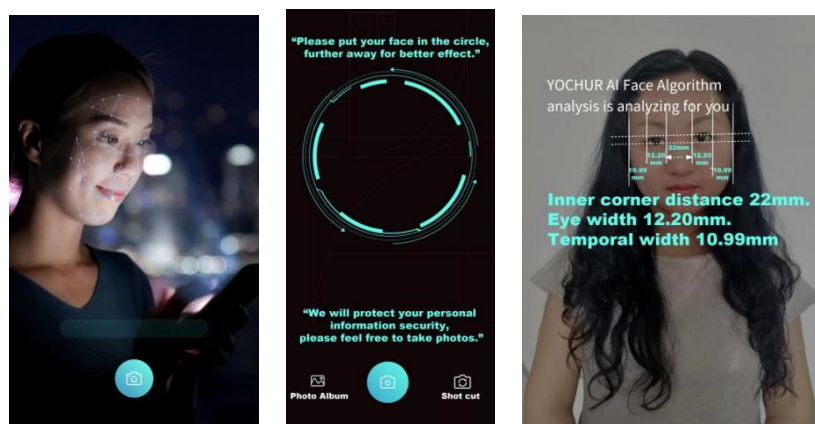

Figure 1 Start Page,Take Photo Page, and AI Face Analysis Page of the WeChat Mini-program Entitled "YOCHUR AI Outfit Analysis" (The figure translated by **youdao** software.)

Furthermore, users proceed to the link of shooting or uploading a "full-body photo" to measure the specific type of personal style. At this stage, the mini-program still calculates body proportions by measuring various body parts, such as the shoulder width, and the length of the upper arm, forearm, thigh, and calf in the photo, thereby determining the type of personal style. Following this, users enter the link of the "YOCHUR AI Color Detection Algorithm," which measures the lightness, purity, warmth, and coldness of the subject's skin color in the photo. Meanwhile, users need to manually select the colors of lipstick during this process by clicking on the page's indicated information of "your favorite 2 lipstick colors". Apart from the two lipstick colors selected by users, the mini-program will employ an AI algorithm to implement comparative analysis on over a hundred lipstick colors, thereby calculating the most suitable color for users. Lastly, users enter the AI matching link of "Scene-oriented Dressing" to form the basic evaluation of the AI image generated. The whole process takes approximately 2 to 3 minutes. The system will eventually form a comprehensive *Basic Detection Report of AI Outfit*. Users solely need to spend RMB 0.1 to unlock this report for further reviewing, as illustrated in Figure 2.
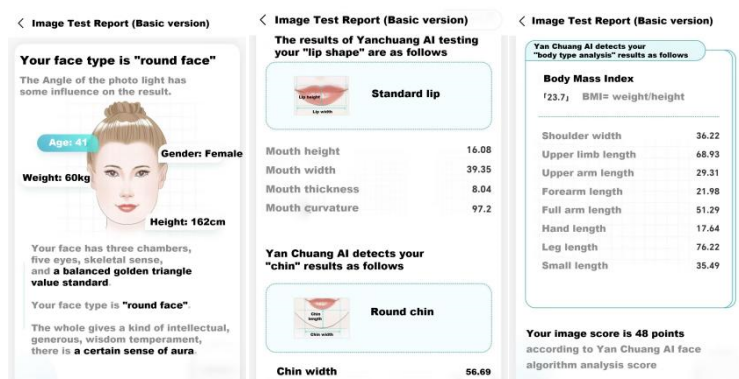

Figure 2 Basic Detection Report of AI Outfit (The figure translated by **youdao** software.)

With its remarkable cost-effectiveness, this learning tool provides a scientific and intuitive reference for the explanation of theoretical courses and the training in practical links. For non-art major students, it acts as an effective learning assistant. Moreover, this software offers free or paid auxiliary tools for laymen who lack professional knowledge related to image design. Given that it is not essential for course learning, this aspect is not further elaborated upon in this research.

3.2 Practical Teaching Unit of "Personal Makeup Design"

3.2.1 Content Analysis of the Teaching Unit

The three elements of image design encompass makeup, hairstyle, and clothing. Makeup design, serving as the first of the three elements, includes skincare and cosmetics applications. A good skin base is a prerequisite for well-applied cosmetics. Thus, daily skincare for diverse skin types is crucial. Cosmetics application is an integral part of contemporary social etiquette. Nevertheless, numerous people's understanding of cosmetics application is limited to the literal level of makeup, ignoring its capabilities in refining, adjusting, and accentuating

features. Regardless of how the fashion trend changes, individuals can leverage reasonable cosmetics applications to adjust their facial shapes and proportions, eye shapes, eyebrow shapes, nose shapes, and lip shapes that suit their respective preferences and fashion trends.

The teaching focus of this unit can be summarized as personal skin diagnosis, daily skincare, cosmetics application-related etiquette, and makeup design.

3.2.2 Student Analysis

Non-art major students have obtained reports on their personal facial shapes, features, and proportions through the previous teaching session, recognizing the shortcomings in their personal appearance as well as the appropriate schemes for further cosmetics application. Nevertheless, the vast majority of makeup novices still feel confused during the implementation of specific operations. Non-art major students who lack a foundation in sketching still find it challenging to achieve proportional adjustments of facial shapes and features based on appropriate cosmetics applications through the utilization of light and shadow effects. Moreover, the comprehensive makeup design based on diverse factors such as clothing, style, and scene is more challenging for them.

The teaching difficulties of this unit can be summarized as the mastery of makeup techniques, makeup design, and the time-place-occasion (TPO) principle concerning clothing, style, and scene.

3.2.3 Digital Intelligence Empowerment

In response to the deficiencies exposed by extensive students in understanding and mastering various aspects such as makeup techniques and style positioning, the course group introduces mobile phone software within the field of beauty cameras as a digital teaching aid during the teaching of this unit. Currently, there are numerous free mobile phone photo-taking applications available on the market with AR filter functionality. In this connection, classroom teaching encourages students to independently explore photo-taking applications that suit their demands. The specific application process can be described as students turning on the beauty camera on their mobile phones and selecting appropriate filter effects based on predetermined occasions and matching hairstyles and clothes, ultimately taking photos and saving them. In this foundation, students are encouraged to comprehensively adjust their facial shapes, features, and proportions by employing the makeup techniques taught in class based on the photos taken.

By virtue of nearly zero-cost investment, these learning tools indeed save a lot of trial and error costs for beginners. Hence, they can act as digital assistants using augmented reality technology, enabling each student to bring their beauty into real life through virtual technology.

3.3 Practical Teaching Unit of "Personal Dress Collocation"

3.3.1 Content Analysis of the Teaching Unit

Clothing, as another key element of the three elements of image design, is a systematic project that requires taking into account diverse factors such as personal skin color attributes, style preferences, body proportions, and the TPO collocation principle. Consequently,

clothing-related teaching needs not only detailed theoretical explanations and a wealth of case studies but also abundant practical operation opportunities for students.

The teaching focus of this unit can be summarized as personal style cognition, TPO clothing collocation principle, clothing color, and style matching principle.

3.3.2 Student Analysis

Most students who study the "image design" aesthetic education course may only have a short semester to master the image-related aesthetic knowledge and techniques. Therefore, all teaching links need to strengthen the training of combining theory with practice, thereby achieving the teaching objective of aesthetic education with twice the result with half the effort. Concurrently, it enables students to apply what they have learned to practice, benefiting from them all their lives.

The teaching difficulty of this unit can be summarized as multi-scene TPO practical training with personal clothing collocation as its core.

3.3.3 Digital Intelligence Empowerment

Usually, physical objects such as clothing and accessories exhibit higher market prices. Moreover, the insufficient quantity of practical exercises falls far short of reinforcing training effectiveness. Therefore, the digital technology assistance of virtual simulation is an urgent issue that the course group needs to address. In this regard, the intelligent AI technology provided by Midjourney can realize the virtual simulation of clothing and wearer photos through iterative technical processes from picture input, and learning to generation. Nevertheless, the cost of each picture generated by it is approximately RMB 3 to 5, with randomness affecting ultimate success rates and fidelity. For this reason, it is not an ideal way to implement practical teaching. To tackle this challenge, the course team finally selects a free, convenient, and efficient mobile phone software that provides real-time clothing-changing services through extensive explorations and experimentation. Particularly, its rich internal clothing resources are enough to fulfill the training demands of the practical teaching segment.

Virtual Fitting Room is a mobile phone application software developed by Changsha Chuangdian Network Technology Co., Ltd., designed to guide users in online shopping as well as real-time dressing collocation[10]. As presented in Figure 3, it can not only create personalized body models based on users' facial features and body shapes but also support users to change their hairstyles, clothes, shoes, hats, ornaments, etc., for the generated character's models with a single click. Simultaneously, it enables users to match pre-configured clothing styles with multi-scene background pictures brought by the software, thereby effortlessly synthesizing the personal dressing collocation pictures in line with the TPO principle. As a whole, it presents a realistic effect, high reduction degree, and strong timeliness, as outlined in Figure 4.

Figure 3 Shortcut Button, Initial Interface, and Personal Image Model Creation Page of Virtual Fitting Room Android Mobile Phone Mini-program (The figure translated by **youdao** software.)

(Workplace)   (Social Contact)   (Leisure)

Figure 4 TPO Multi-scene Dressing Collocation of Virtual Fitting Room

Likewise, this learning tool serves as a zero-cost, user-friendly VR digital intelligent assistant. It does not, however, support the import of external clothing pictures. Along with the improvement of computer computing capability and technological expertise, this demand is potentially achievable in the near future.

3.4 Practical Teaching Unit of "Personal Wardrobe Management"

3.4.1 Content Analysis of the Teaching Unit

As per the TPO principle of personal image design, each individual's wardrobe should be equipped with clothing suitable for diverse occasions, such as professional clothes, casual wear, fashionable daily outfits, and celebration dresses, to address diverse seasons and weather conditions. To avoid clutter and inconsistency in the wardrobe, it is imperative to introduce scientific and reasonable personal wardrobe management to realize a comprehensive control of different costumes and make full use of specific costumes, thereby maximizing their utility. Meanwhile, it is in line with the developmental needs of a conservation-oriented society.

The teaching focus of this unit can be summarized as the classification method and management practice of personal wardrobe.

3.4.2 Student Analysis

It is not difficult for the vast majority of students to comprehend the theoretical knowledge of personal wardrobe management. What they lack are effective tools for categorizing clothes in their personal wardrobes as well as straightforward practical training.

The teaching difficulty of this unit can be summarized as the practical training of conservation-oriented personal wardrobe management.

3.4.3 Digital Intelligence Empowerment

My Wardrobe Butler is an intelligent personal clothing management software that is convenient for clothing intuitive classification as well as TPO multi-scene dressing collocation. It is a WeChat mini-program developed by the same company as the YOCHUR AI Outfit Analysis. Both programs can not only realize one-click switching within the interface but also support logging in with the same user ID. However, they present completely different functions. In class, we primarily employ the "Clothing Classification" and "Matching Puzzle" functions provided by My Wardrobe Butler.

My Wardrobe Butler features a robust "Clothing Classification" function. In its virtual wardrobe, the costumes are classified into seven categories, encompassing outerwear, inner clothes, bottoms, shoes, bags, accessories, and makeup. A specific category involves more detailed subdivisions. The outerwear category, for example, includes diverse specialized sections such as coats, furs, suits, down cotton-padded jackets, cardigans, vests, short-sleeved coats, and others. In its "Home Page" and "Wardrobe" tabs, users can take and upload photos of themselves wearing existing clothes. Immediately, this software can remove images other than the main clothes from the photos through the "auto-matting" function and set various information such as category, color, season, brand, price, purchase time, etc., for the remaining main clothes, thereby completing the entry and filing of personal clothes, as illustrated in Figure 5.
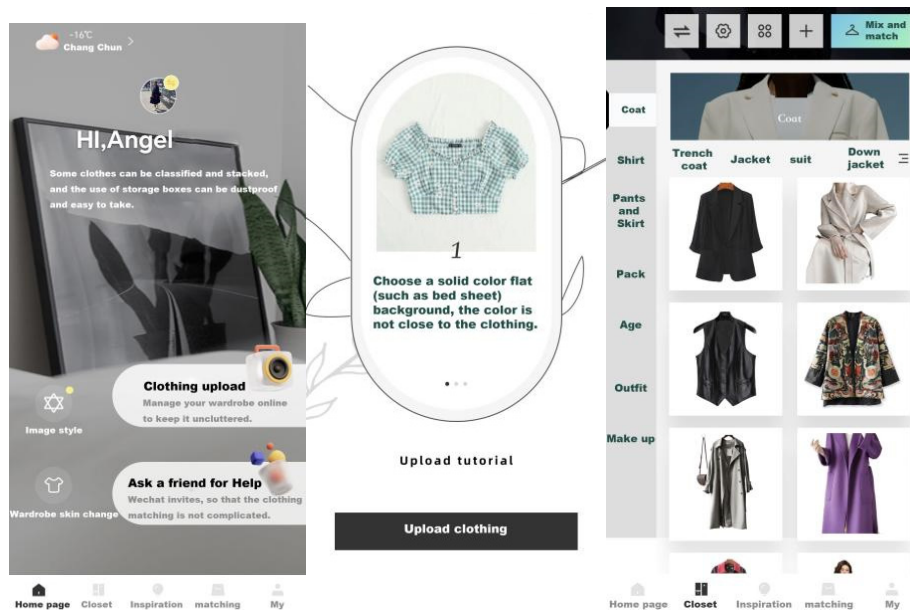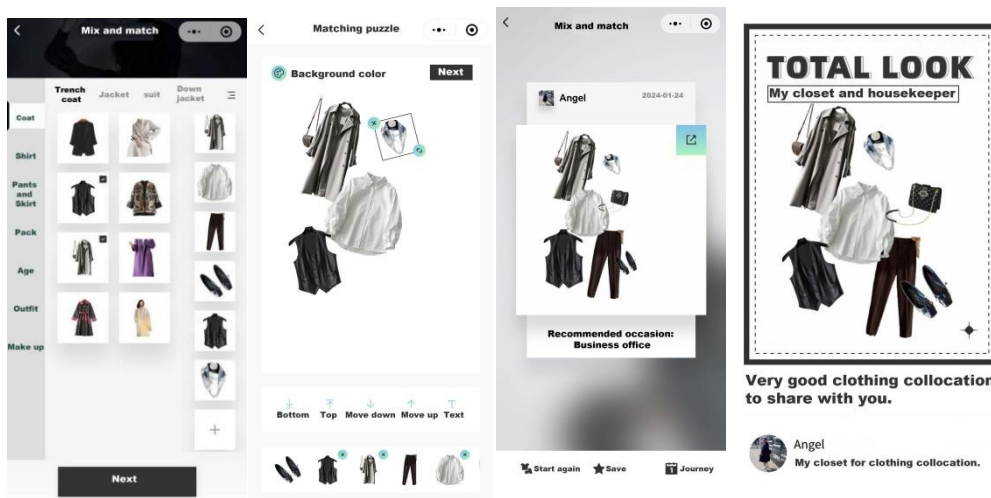
Figure 5 Home Page,Upload Tutorial Page, and Wardrobe Interface of My Wardrobe Butler Android Mobile Phone Mini-program (The figure translated by **youdao** software.)

Notably, the "Matching Puzzle" function of My Wardrobe Butler is available for free for users to utilize and download. The specific operation flow is outlined in Figure 6. To begin with, users enter the "Free Mix and Match" page and select the clothing items that have been entered into the "Wardrobe" through the "+" button. At this step, users can only add their options. Following this, users click "Next" to enter the "Matching Puzzle" page to combine the selected clothing items into a poster puzzle. Simultaneously, users can change the background color of the puzzle while selecting applicable occasions in this step. Subsequently, users continue to click "Next" to complete the "Matching Puzzle". Lastly, users can download the matched puzzle to the mobile phone gallery for subsequent demand-based utilization. Moreover, users can save the "matching puzzle" in the built-in favorites of the program or load it into the schedule set in the program according to their personal schedule, thereby setting up a suitable wearing scheme in advance for future trips or related personal activities.

(Single Item Selecting)   (Matching Puzzle)   (Matching Completed)   (Puzzle Saving)

Figure 6 "Free Mix and Match" Operation Process and Saved Puzzle of My Wardrobe Butler Android Mobile Phone Mini-program (The figure translated by **youdao** software.)

The number of uploaded items allocated by this software is limited for ordinary users. Nevertheless, users can earn "face-score points" in various ways, such as recommending content in the software, watching advertisements, or inviting new users, to exchange for more item uploads. Moreover, users can directly pay the annual membership or permanent membership registration fee to obtain an unlimited number of uploaded items. During the study of Personal Wardrobe Management in the "Image Design" aesthetic education course, this tool serves as an intuitive and scientific digital assistant. Also, it can act as an effective helper for students in their daily wardrobe planning and clothing item selection.

3.5 Course Construction Management

Immersion aesthetic education not only requires the construction of a sustainable and comprehensive environment but also stimulates the enthusiasm of both teachers and students for full engagement. Hence, the digital aesthetic education companion, coupled with the digital interaction management on the online course platform, furnishes an excellent pathway for its implementation. Meanwhile, specific course construction and management should conform to the requirements of the evaluation system of artificial intelligence in education (AIED), focusing on diverse factors such as teaching efficacy, interest, effectiveness, and the possibility of on-site implementation, thereby effectively improving the education and teaching effectiveness[11].

3.5.1 Case-based Guidance

During the construction of online courses, teachers can provide students with a plurality of teaching cases involving image etiquette, modeling, and other content on the teaching platform, so that students can learn by themselves in their spare time. On the same note, teachers can put

forward the problems found on the platform or bring them to class for discussion, thus addressing these problems through written and verbal communication with students.

3.5.2 Questionnaire Survey

Teachers can collect problems that students want to address through the "Image Design" aesthetic education course by designing questionnaires on the online platform. Based on the background statistics, teachers can further answer these common or personalized questions in class, thereby enhancing the closeness and adhesion between students and the course.

3.5.3 Classroom Discussion and Interaction

By means of the interactive function of online teaching platforms, teachers can implement various activities such as topic discussion, democratic voting, random question and answer, quick answering, and sign-in activities with their classmates in class. Briefly, teachers can make full use of online teaching platforms to facilitate the classroom activities of the aesthetic education course.

3.5.4 Assignment Submission and Mutual Evaluation

Teachers can collect students' assignments through the online teaching platform and set up the function of assignment mutual evaluation among students, so that students learn from each other and find their shortcomings.

3.5.5 Comprehensive Performance Evaluation

By recording students' learning activities, the online teaching platform can assist teachers in automatically generating various auxiliary materials such as classroom reports as well as statistics of learning conditions and scores, etc., so that teachers can control students' course participation in real-time and effectively guide students' further learning. Concurrently, it can provide an objective and scientific evaluation result for teachers in comprehensive performance evaluation.

Leveraging the AIED evaluation system, this research takes satisfaction as an index to evaluate the teaching effect of AIED teachers, examining the actual teaching effect of teachers as well as other effects such as teaching efficacy, interest, effectiveness, and the possibility of on-site implementation.

4 Teaching Design and Teaching Efficiency

Table 1. Teaching Design and Teaching Efficiency

Teaching Design / Teaching Efficiency			Experimental Class (90 students)	Comparison Class (90 students)
Before	Professional Background		Non-art Design Major	Non-art Design Major
	Teaching Method		Digital Intelligence	Practical Operation
	Class Hour		32	32
Amid	Form of Work		Author: Baihe Liu	Author: Panxue Wang
	Training Times		Indefinite	Single
	Per Capita Cost Input	Makeup	¥ 0.00	¥ 35.00
		Hair Style	¥ 0.00	¥ 15.00
		Dress Collocation	¥ 0.00	¥ 50.00
After	After-school Tutoring	With Classmates	★ ★ ★ ★	★ ★ ★
		With Teache	★ ★ ★ ★	★ ★ ★
		In the Community	★ ★ ★ ★ ★	★ ★
		In the APP	★ ★ ★ ★ ★	\
Questionnaire Survey		Curriculum Evaluation	★ ★ ★ ★	★ ★ ★
		Lifelong Benefit	★ ★ ★ ★	★ ★

4.1 Teaching Design

The teaching design and teaching efficiency flow is outlined in Figure 6.

4.1.1 Before Teaching

Before teaching, two classes are established: an experimental class and a control class. In conformity with the initial conditions of both classes, students from both classes are selected with non-art design backgrounds, totaling 90 students in each class. The course duration is uniformly set to 32 class hours.

4.1.2 Amid Teaching

(1) Form of work: Both the experimental class and the control class engage in training on the topic of "Daily Personal Overall Image Design." The experimental class utilizes digital smart software for "immersive" training, completing four training plans. In contrast, the control class undergoes training through real-life operations and live photography, completing one training plan.

(2) Training frequency: Over the uniform 32 class hours, students in the experimental class, utilizing digital smart software, can iteratively experiment, revise, and refine their design plans without constraints. Conversely, students in the control class, relying on real-life operations, spend more time and resources on designing schemes and procuring materials. Upon the confirmation of the personal image design plan, there is minimal opportunity for revision, with only one practical implementation.

(3) Material investment: Students in the experimental class can conduct practice training for the course at zero cost and with unlimited frequency using digital smart software. Conversely, the practical training for the control class necessitates an investment of 100 yuan per person per session for materials.

4.1.3 After Teaching

(1) Experimental class: Students in the experimental class benefit from real-time interaction and communication with teachers, classmates, and community experts facilitated by digital communities and smart software. This enables more timely and convenient guidance after teaching, enhancing the immersive aesthetic education learning experience. The integration of intelligence empowers students in the experimental class, augmenting their learning process.

(2) Control class: Conversely, the control class faces limitations due to learning costs and time constraints. Opportunities for guidance after teaching and self-improvement diminish as the reliance on intelligence increases, resulting in a reduced impact of aesthetic education teaching.

4.2 Teaching Effects

4.2.1 Student feedback

Results from a questionnaire survey on the "Image Design" aesthetic education course indicate that both in terms of teaching effects and long-term benefits, feedback from the experimental class surpasses that of the control class. This demonstrates the superior effect of the experimental class, empowered by digital intelligence, in facilitating the infiltration of aesthetic education teaching compared to the control class.

4.2.2 Expert feedback

Digital intelligence technology has rapidly developed and been widely applied only in the past year, and immersion aesthetic education is still in its infancy. Therefore, the research on the integration of digital intelligence into the practice path and methods of immersion aesthetic education is still in the exploration and adjustment stage. However, some experts have given positive feedback on this research, stating that the discussion on the pros and cons of AI in

education is valuable in considering the potential implication of incorporating digital technology in aesthetic education. This provides our research team with the motivation and courage to move forward. At the same time, we hope to receive more extensive support and suggestions from experts and peers in the future.

5 Conclusions

As discussed by AI ethical analysis experts and scholars, AI has its advantages and disadvantages.

Likewise, people's comments on these digital intelligent software applied in the course of "image design" aesthetic education are mixed. Some people think it is useful, while others argue that it is unnecessary.

Indeed, any phenomenon typically triggers various debates among people. Along with the development of digital technology, digital intelligence has increasingly provided convenience and efficiency for human production, life, and study. Still, the current digital intelligence inevitably depends on the study and simulation of existing human knowledge to generate a work. In terms of digital originality and subversive innovation, digital intelligence does not yet possess the strength comparable to human wisdom. On the other hand, professionals with corresponding knowledge reserves and skills in traditional professional fields can generally perform better within the field of digital technology. After all, the process of digital generation and the quality of its results need to withstand the scrutiny and evaluation of professionals. For these reasons, the status quo of the world's mixed opinions on digital technology and achievements naturally emerge.

To sum up, digital intelligence can solely play a limited auxiliary role in empowering aesthetic education courses. To veritably cultivate students' sentiments through aesthetic education and enrich their lives, the top priority is to encourage them to accumulate aesthetic theory over the long term, master skills deeply, and gain profound insights into beauty.

References

[1] Notice on Comprehensively Implementing the Aesthetic Education Infiltration Action in Schools. https://www.gov.cn/zhengce/zhengceku/202401/content_6924205.htm
[2] How to Implement the Deepening Action of Aesthetic Education Teaching Reform? Response from the Ministry of Education | School | Art Education _ NetEase Subscription (163.com) https://www.163.com/dy/article/IONQR85H0514R9NP.html
[3] Karin Stolpe and Jonas Hallström. Artificial intelligence literacy for technology education. Computers and Education Open, 6(2024): 100159-.
[4] 5 Minutes to Learn about Artificial Intelligence (AI), Virtual Reality (VR), and Augmented Reality (AR) (baidu.com) https://baijiahao.baidu.com/s?id=1585398652029594255&wfr=spider&for=pc

[5] Fifty Years Ago, Qian Xuesen Named VR "Lingjing"-Xinhuanet (news.cn) http://www.news.cn/tech/2021-11/30/c_1128114970.htm

[6] Understanding the Difference and Utilization of AR and VR in One Minute: What are the Different Experiences and Benefits of Them? Technology, Artificial Intelligence, Haokan Video (baidu.com) https://haokan.baidu.com/v?pd=wisenatural&vid=2801541642492142963

[7] Intelligence (Chinese Words) _ Baidu Baike (baidu.com) https://baike.baidu.com/item/%E6%99%BA%E8%83%BD/66637?fr=ge_ala

[8] Davis, K., Christodoulou, J., Seider, S., & Gardner, H. The Theory of Multiple Intelligences. In R.J. Sternberg & S.B. Kaufman (Eds.), Cambridge Handbook of Intelligence (485-503). Cambridge, UK; New York: Cambridge University Press. (2011).

[9] Turing Experiment _ Baidu Baike (baidu.com) https://baike.baidu.com/item/%E5%9B%BE%E7%81%B5%E5%AE%9E%E9%AA%8C/11050312?fromModule=search-result_lemma-recommend

[10] Virtual Fitting Room Technology Platform Download-Virtual Fitting Room App Download v7.5.2 Android Version - 2265 Android Web Site

[11]Yun Hoe Jeong, et al. A Study on the Direction of AIED Teacher Education in Korea[J]. Education research. vol.82, pp.135 - 155.(2021).