Based on VR Technology the Influence of School Organizational Innovation Atmos Phere Artistic Creativity of University Students: Mediating Role of Flow Experience

Wei-Ying Wang, Li-Chu Tien, and Yu-Qi Du

***Abstract*—Based on the theory of immersion, this article explores the influence of the school's organizational innovation atmosphere on the improvement of college students' artistic creativity. Use AMOS data analysis to verify the impact of the school's organizational innovation atmosphere and flow experience on college students' artistic creativity? Explore new ways to use virtual reality technology to improve university art professional education, apply virtual reality technology to university art professional education, and provide a more modern and innovative atmosphere for art professional education. Discuss how virtual reality can play a greater potential in the process of art professional education, create an artistic conception of flow experience for college students, stimulate their artistic creativity, and improve the quality of art professional education. Explore the ways that virtual reality technology can help art students to improve their artistic creativity.**

***Index Terms*—Artistic creativity, flow experience, school organizational innovation atmospher, virtual reality.**

I. Introduction

First of all, through interviews and investigations, it is learned that there are many research spaces in the cultivation of artistic design creativity in China. First, the support of information technology for artistic creativity training and teaching lacks a systematic and comprehensive application; Second, artistic creativity training activities is difficult to integrate with network technical support; third, the artistic creativity training activities are scattered, lacking integrity, comprehensiveness, and systemicity and communication. Secondly, this research combines VR mode training with the combination of theory and practice training mode, combined with my more than 20 years of practical experience in art design teaching, from VR thinking mode to VR mode training in the art design professional teaching process. The training model combines theory and practice, and builds a three-dimensional training model to enhance the artistic creativity of college students. Exploring the ways of cultivating the artistic creativity of college students, through targeted attempts in practical teaching in recent years, we have accumulated some experience and achieved certain results. We feel that it is necessary to form a theoretical discussion.

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II. Literature Review

A. Virtual Reality

VR is the first letter of English Virtual Reality. Virtual Reality technology is a computer interactive three-dimensional dynamic visual scene and entity behavior simulation system that can create and experience a virtual world. The core experience of Virtual Reality's creation of art is interactivity, immersion and full of imagination (Guo Zhaowei, 2020) [1]. When the creators create VR paintings based on the virtual reality system, they can walk into the picture in person and form a highly harmonious interaction with the works (Mao Da, 2019) [2], and even themselves become part of the paintings as shown in Fig. 1 Shown.

Fig. 1. Using tilt brush for VR painting creation.
(Image source: Tilt Brush official video introduction)

This strongest sense of immersion can easily inspire creators and realize their creativity easily. As shown in Fig. 2, this Anna from France uses Tilt Brush to create VR paintings and experience the beauty of painting in a picture. HTC Vive+Titl Brush is the current main VR painting system architecture, which is in part a reflection of The characteristics based on the VR system (Chen Guojun, 2020) [3].

Fig. 2. Using tilt brush for VR painting creation.
(Image source: Tilt Brush official video introduction)

Virtual Reality's creation of art is a new way of thinking, which opens the door of imagination and broadens the path of human creativity. VR technology is also known as virtual reality. VR painting is a new combination with VR

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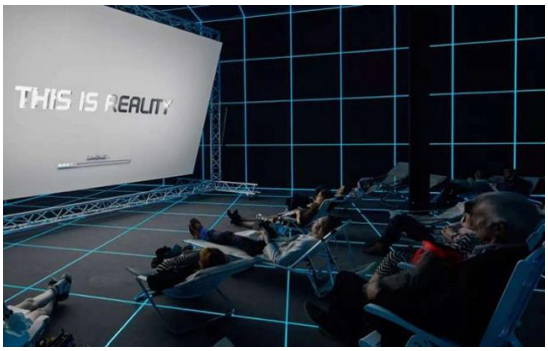
technology and artistic creation, and it is known as the "tenth art" of mankind (Zhao Xuefang & Wang Chenwei, 2018) [4]. In 2015, Google held the world's first virtual reality art exhibition in San Francisco, and the new products displayed in the conference set off a new wave of VR around the world (Wen Yiqi, 2018) [5]. Google's acquisition of VR paintings by artists has further promoted the influx of creators into this new field of artistic creation. In the same year, TIME magazine in the United States also invited seven artists to show the VR painting process, showing this new art form to the world. "2020 Asian Digital Art Exhibition" exhibited at Times Art Museum, Beijing, China from September 26, 2020 to November 22, 2020. The exhibition invited 32 artists and art teams from 11 countries and regions around the world to create 32 top-notch digital art works, including virtual and reality technology, brain science, ecological art, immersive space, etc. Fig. 3 is from Japanese authors and Two works by Chinese authors.



(a) "Sun Factory" Japan Author: Hito Steyerl

(b) "VR·Eye Movement Mountain and Sea·Travel Guide" Chinese Author: Chen Baoyang

Fig. 3. Representative works of VR creation in China and Japan.
(Image source: 2020 Asia Digital Art Exhibition)

The artists who accepted the invitation said that the virtual space painting brought about by virtual reality technology broke the previous situation that creators could only paint on flat paper or software. As shown in Fig. 4, it can be seen that VR technology is very important. The promotion value and application prospects of Liu Ping, 2018 [6].

Fig. 4. Using tilt brush for VR painting creation.
(Image source: Tilt Brush official video introduction)

B. Artistic Creativity

Artistic creativity refers to the performance of creativity in any aspect of art, including music, dance, drama, visual art, literature, movies, etc. (Alland, 1977). Artistic creativity is something that every individual possesses and is used to The ability to solve artistic problems and create unique and high aesthetic value or products (Zeki, 2001; Sternberg & Lubart, 1996; Feist, 1998). The artistic creativity defined in this research refers to the ability of all individuals in any aspect of art to solve artistic problems and produce novel ideas or works with higher aesthetic values.

C. Immersion Theory

Csikszentmihalyi, the immersion theory proposed in 1975, when a person engages in an activity without distracting thoughts, he will devote himself to it, even forget everything around him, and enter a state of selflessness. When we are in a certain environment, we will be deeply hinted by the environment, so that we can accelerate into the state we want to enter. In this state, it is easier to generate creative inspiration, and this inspiration is of great significance to the work created.

D. Flow Experience

Flow was first researched by Csikszentmihalyi. When a person concentrates on something, it is the perfect state of losing self-consciousness, feeling that time flies, and being fully integrated into it. (Csikszentmihalyi, 1975) [7]. Flow_Experience is the best psychological experience. (Csikszentmihalyi, 1975, 1988 [8], 1990 [9], 1993; Jackson, 1992 [10]). The flow experience defined in this research refers to the disappearance of self-awareness of the individual in the process of artistic creation, time flies, creative inspiration constantly emerges, creative skills to the extreme, and a kind of best psychological feeling that is devoted to design creation.

E. School Organizational Innovation Atmosphere

Organizational innovation atmosphere refers to an individual's psychological feeling about whether the external environment is conducive to their own innovative activities, is the overall perceptual description of the work environment in which they are located, and is the perception of the degree of support for innovation and creativity in the work environment When the members of the organization feel the existence of the innovation environment, the organizational innovation atmosphere is formed (Amabile & Conti, 1996 [11]). The definition of this research is that the school organizational innovation atmosphere refers to a kind of psychological feeling that students feel that the external school environment is conducive to individual innovation activities, and it is an overall perceptual description of the school's creative environment in which they are located.

III. Research Methods

Construct the following research structure diagram based on the immersion theory

A. Research Structure

Fig. 5 shows research framework diagram.

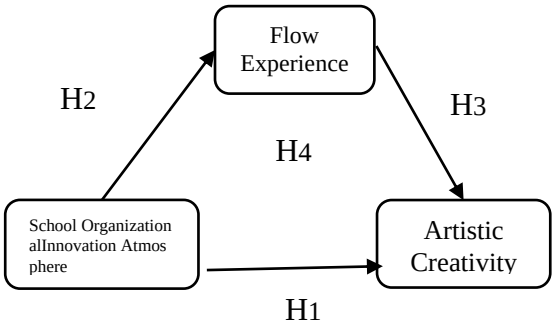


Fig. 5. Variable architecture diagram.
Source: drawn by the researcher

B. Research Hypothesis

Based on the research structure diagram, the following four hypotheses are proposed:

H1: The school's organizational innovation atmosphere has a positive impact on the artistic creativity of college students.

H2: The school's organizational innovation atmosphere has a positive impact on the flow experience of college students.

H3: The flow experience of art majors has a positive impact on the artistic creativity of college students.

H4: The flow experience of art majors has an intermediary effect between the sense of the school's organizational innovation atmosphere and artistic creativity.

C. Research Object

According to the suggestion of the researcher (Wu Minglong, 2010) [12], the average sampling number of the regional research sample is about 1000 as the best. Therefore, this study distributed questionnaires to 1,100 art majors in three local comprehensive colleges and universities in Jilin Province, China. After the questionnaires were answered, exclude 9 invalid questionnaires were excluded, 1091 valid questionnaires were recovered, with a recovery rate of 99.2. %, therefore, 1091 valid samples were drawn in this study.

D. Research Tools

In this study, suitable measurement tools are selected for measurement. This measurement tool is composed of three scales. Contains the "Kaufman Domain of Creativity Scale (K-DOCS)", a scale of creativity covering 5 fields. The reliability coefficient of the scale is at least 0.80 and greater than 0.7, and it has a desirable construct validity. This research uses the performance creativity and artistic creativity scale (Kaufman, 2012) [13]; the "School Organizational Innovation Climate Scale", and the "Organizational Innovation Climate Scale" researched by Qiu Haozheng and others have a reliability coefficient of up to .97, the reliability of each subscale ranges from .85 to .95. A total of 35 items, 7 dimensions, namely, organizational philosophy, working methods, resource provision, team operation, leadership effectiveness, learning growth, environmental atmosphere (Qiu Haozheng, Chen Yanzhen, Lin Bifang, 2009) [14]; "Heart Flow Chart", Using Liu Weina's "The Short Flow State Scale, SFSS" Chinese version of the revised scale "Simplified State Fluency Scale" has 9 dimensions, which are challenge-skill balance, action-conscious integration, and clear goals, Clear feedback, full attention to the current task, sense of control, loss of self-awareness, time change and enjoyment experience. The reliability coefficient of the scale is 0.70. A total of 9 items (Liu Weina, 2010) [15].

IV. Hypothetical Model Verification Analysis

A. The Direct Effect of the School's Organizational Innovation Atmosphere on Artistic Creativity

1) Model fitting diagram

This study constructs a theoretical model through the linear structural equation model, and uses AMOS version 24.0 statistical software to verify the causal model. The analysis results are shown in Fig. 6. The influence coefficient of the school's organizational innovation atmosphere on the path of artistic creativity is 0.71.

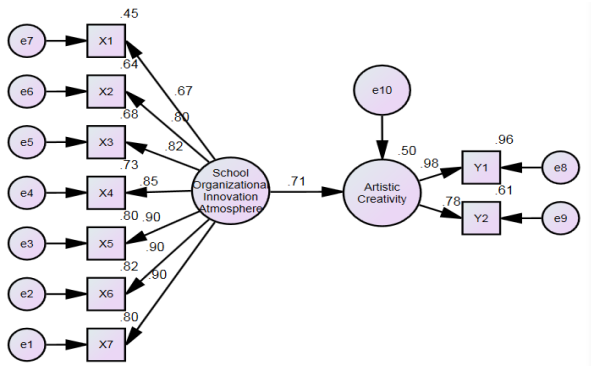


Fig. 6. The direct effect model of the school's organizational innovation atmosphere on artistic creativity.
Source: drawn by the researcher

2) Violation estimation test

The coefficients of this study are shown in Table I: The error variance of the direct effect model of school organizational innovation atmosphere and artistic creativity is between .022-.656, which are all positive; the standardized weighted regression coefficient is between 0.672-0.948 It is not greater than .950; the standard error is between .051-.081, and the t-values are all significant, which proves that there is not much standard error. Therefore, there is no violation of estimates in this model.

3) Verification of model fit

In the overall model fit verification, the purpose of the value-added fit verification is to compare with the theoretical model with a more stringent or nested baseline model to measure the degree of its fit improvement ratio; absolutly the fit index is used to determine the degree to which the overall theoretical model can predict the observed variables or correlation matrix; the simple fit test is used to present the estimated coefficients of the model fit that needs to reach a special level (Huang Fangming, 2005) [16]. The summary of the degree of adaptation between the school's organizational innovation atmosphere and the role model of artistic creativity is shown in Table II below: GFI=.917, AGFI=.808, RMR=.815, all reaching the level of adaptation. Therefore, in

terms of absolute adaptation index, the mode adaptation is good. In terms of value-added adaptation indicators, the various indicators NFI=.911, NNFI (TLI)=.913, CFI=.902, RFI=.905, IFI=.903, the index values are all above .900, and all of them are suitable. The standard shows that the mode adaptation is ideal in terms of the value-added adaptation index. In terms of simple and effective adaptation indicators, PGFI=.651, PNFI=.642, both greater than .500, the display mode adaptation is still good, which meets the requirements of mode simplification.

TABLE I: SUMMARY TABLE OF PARAMETER ESTIMATES OF THE DIRECT EFFECT MODEL OF SCHOOL ORGANIZATIONAL INNOVATION ATMOSPHERE AND ARTISTIC CREATIVITY

parameter	Regression weighting coefficient	Standard error	t value	Error variance
School_Organizational_Innovation_Atmosphere→Artistic Creativity	.708	.051	11.990***	.656
School_Organizational_Innovation_Atmospher→Atmosphere	.896	.021	7.740***	.160
School_Organizational_Innovation_Atmospher→Learning and Growth	.904	.049	20.148***	.141
School_Organizational_Innovation_Atmospher→Leadership Effectiveness	.896	.046	19.261***	.128
School_Organizational_Innovation_Atmospher→Team Operation	.854	.059	17.165***	.253
School_Organizational_Innovation_Atmospher→Resources	.822	.063	15.796***	.313
School_Organizational_Innovation_Atmospher→Way of Working	.802	.057	15.165***	.276
School_Organizational_Innovation_Atmospher→Organization Philosophyphy	.672	.041	11.279***	.174
Artistic Creativity→Artistic Creativity	.948	.030	6.125***	.022
Artistic Creativityr→Performance Creativity	.781	.081	11.797***	.284

Note：*p<.05; **p<01; ***p<.001

Source: compiled by this research

TABLE II: SUMMARY OF THE DEGREE OF ADAPTATION BETWEEN THE SCHOOL'S ORGANIZATIONAL INNOVATION ATMOSPHERE AND ARTISTIC CREATIVITY MODELS

Statistical inspection and quantification		standard value	Identification result
Absolute fit index	GFI	more than the 0.900	.917
	AGFI	more than the 0.800	.808
	RMR	more than the 0.080	.815
Incremental Fit Index	NFI	more than the 0.900	.911
	NNFI (TLI)	more than the 0.900	.913
	CFI	more than the 0.900	.902
	RFI	more than the 0.900	.905
	IFI	more than the 0.900	.903
Streamlined fitness index	PNFI	more than the 0.500	.642
	PGFI	more than the 0.500	.651

Source: compiled by this research

As shown in Table I and III, the path coefficient of school organizational innovation atmosphere to artistic creativity is 0.708, t=11.990, and the path coefficient is significant. Therefore, hypothesis 1 of this research is established, which means that college students perceive the school organizational innovation atmosphere. The higher the degree, the stronger the artistic creativity.

TABLE III: SUMMARY OF THE VERIFICATION OF THE RELATIONSHIP BETWEEN THE INNOVATIVE ATMOSPHERE OF THE SCHOOL ORGANIZATION AND THE PATH OF ARTISTIC CREATIVITY

Hypothesis	path	Hypothetical relationship	Path value	Hypothesis
H1	School_Organizational_Innovation_Atmosphere→Artistic Creativity	Positive	.708***	Established

Source: compiled by this research

B. The Direct Effect of School Organizational Innovation Atmosphere on Artistic Creativity and the Direct Effect of Flow Experience on Artistic Creativity

1) Model fitting diagram

This study constructs a theoretical model through the linear structural equation model, using AMOS24.0 version of

statistical software Carry out the effect mode verification, and the analysis results are summarized as shown in Fig. 7.

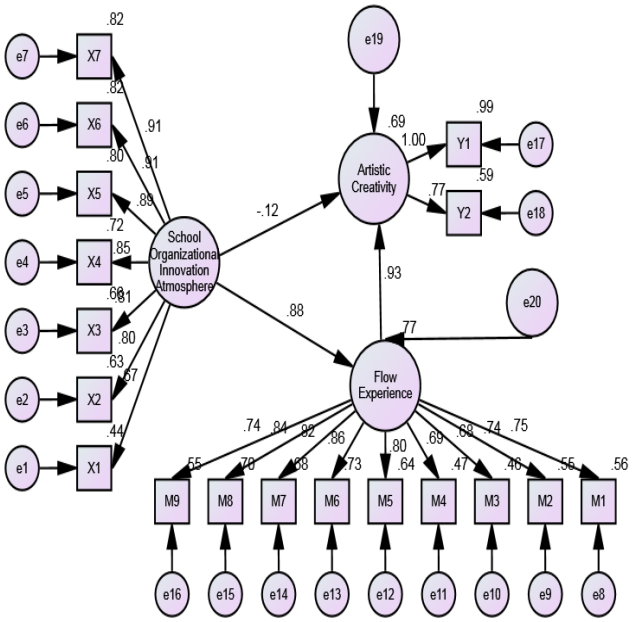


Fig. 7. A model diagram of the direct effect ofthe school's organizational innovation atmosphere and flow experience on artistic creativity.
Source: drawn by the researcher

2) Violation estimation test

It can be seen from Table IV that the overall effect model of the school's organizational innovation atmosphere, flow experience, and artistic creativity is incorrect.

The variance of the difference is between 0.003-0.548, which are all positive values; the standardized weighted regression coefficient is between .-0.123-0.947 and not greater than .950; the standard error is between 0.016-0.221, and the t-values are all significant, To prove that there is not much standard error. Therefore, there is no violation of estimates in this model.

3) Verification of the overall model fit

As shown in Table V below, GFI=.901, AGFI=.807, and RMR=.805, all of which have reached the level of adaptation. Therefore, in terms of absolute adaptation index, the mode adaptation is good. In terms of value-added adaptation indicators, the various indicators NFI=.933, NNFI (TLI)=.935, CFI=.906, RFI=.924, IFI=.916, the index values all reach above .900, and all of them reach the appropriate level. The standard shows that the mode adaptation is ideal in terms of the value-added adaptation index. In terms of simple and effective adaptation indicators, PGFI=.746, PNFI=.718, both greater than .500, the display mode adaptation is still good, meeting the requirements of mode simplification.

TABLE IV：SUMMARY TABLE OF PARAMETER ESTIMATION OF THE DIRECT EFFECT MODEL OF THE SCHOOL'S ORGANIZATIONAL INNOVATION ATMOSPHERE, FLOW EXPERIENCE, AND ARTISTIC CREATIVITY

parameter	Regression weighting coefficient	Standard error	t value	Error variance
School_Organizational_Innovation_Atmosphere→Flow_Experience	.877	.221	8.814***	.141
School_Organizational_Innovation_Atmosphere→Artistic_Creativity	-.123	.216	-1.075.282	.160
Flow_Experience→Artistic_Creativity	.935	.106	7.485	.157
School_Organizational_Innovation_Atmosphere→Organization Philosophy	.667	.018	9.600***	.176
School_Organizational_Innovation_Atmosphere→Way of Working	.796	.031	10.346***	.283
School_Organizational_Innovation_Atmosphere→Resources	.813	.036	10.428***	.326
School_Organizational_Innovation_Atmosphere→Team Operation	.849	.030	10.753***	.259
School_Organizational_Innovation_Atmosphere→Leadership Effectiveness	.892	.016	11.188***	.133
School_Organizational_Innovation_Atmosphere→Learning and Growth	.907	.018	11.313***	.137
School_Organizational_Innovation_Atmosphere→Atmosphere	.908	.019	11.314***	.143
Flow_Experience→Balance	.748	.060	9.171***	.548
Flow_Experience→Fusion	.744	.078	11.013******	.413
Flow_Experience→Target	.676	.073	9.832***	.432
Flow_Experience→Feedback	.689	.082	9.966***	.511
Flow_Experience→Concentrated	.803	.065	11.644***	.221
Flow_Experience→Control	.857	.061	12.547***	.149
Flow_Experience→Awareness	.823	.065	12.036***	.205
Flow_Experience→Time	.838	.068	12.293***	.206
Flow_Experience→Enjoy	.741	.069	10.690***	.310
Artistic_Creativity→Artistic_Creativity	.947	.078	8.129***	.003
Artistic_Creativity→Performance Creativity	.766	.036	8.424***	.301

Note：*p<.05; **p<.01; ***p<.001

Source: compiled by this research

TABLE V: SUMMARY TABLE OF ADAPTATION OF THE OVERALL MODE OF SCHOOL ORGANIZATIONAL INNOVATION ATMOSPHERE, FLOW EXPERIENCE, AND ARTISTIC CREATIVITY

Statistical inspection andquantification		standard value	Identification result
Absolute fit index	GFI	more than the 0.900	.901
	AGFI	more than the 0.800	.807
	RMR	more than the 0.080	.805
Incremental Fit Index	NFI	more than the 0.900	.933
	NNFI (TLI)	more than the 0.900	.935
	CFI	more than the 0.900	.906
	RFI	more than the 0.900	.924
	IFI	more than the 0.900	.916
Streamlined fitness index	PNFI	more than the 0.500	.718
	PGFI	more than the 0.500	.746

Source: compiled by this research

4) Path relationship verification

It is known from Table IV and Table VI that the path coefficient of the school's organizational innovation atmosphere on the flow experience is .877, t=8.814, greater than 1.96, the path coefficient is significant, so the hypothesis two of this research is established, which means that college students' perception the higher the school's organizational innovation atmosphere, the better experience of flow experience; the path coefficient of flow experience to artistic creativity is .935, t=7.485, and the path coefficient is significant. Therefore, hypothesis 3 of this research is established, indicating the flow experience of college students The better the feeling, the stronger the artistic creativity.

TABLE VI: SUMMARY OF THE VERIFICATION OF THE RELATIONSHIP BETWEEN THE SCHOOL'S ORGANIZATIONAL INNOVATION ATMOSPHERE, FLOW EXPERIENCE AND ARTISTIC CREATIVITY PATH

Hypothesis	path	Hypothetical relationship	Path value	Hypothesis
H2	School_Organizational_Innovation_Atmosphere→Flow_Experience	Positive	.877***	Established
H3	Flow_Experience → Artistic Creativity	Positive	.935**	Established

Source: compiled by this research

C. The Mediating Role of Flow Experience

This study explores the relationship between variables through structural equations (SEM). When the relationship between variables is significant, it means that there is a direct effect between the variables; if it is not significant, it means that there is no direct effect between the variables. In addition to direct effects between two variables, there may also be indirect effects, that is, there may be intermediate variables between two variables, but the premise is that the direct effects between the variables should be significant. If there is any direct effect If it is not significant, the indirect effect cannot be established, that is, there is no intermediary effect (Qiu Haozheng, 2003).

Baron and Kenny (1986) [17] believe that the verification of intermediary effect should be verified by three regression models. One is that the independent variable must be able to significantly predict the dependent variable; the other is the independent variable must be able to significantly predict the intermediary variable; and the third is the intermediary variable must be able to predict the dependent variable significantly. At the same time, Baron et al (1986) also pointed out that when the independent variable and the intermediate variable are simultaneously input into the regression model, the predictive effect of the intermediate variable is significant, and the predictive effect of the independent variable decreases, which is a partial intermediate; the prediction of the independent variable if the effect disappears, it is a complete intermediary. It can be seen from Table IV-1 and Table IV-3 that when the effect of the school organizational innovation atmosphere on artistic creativity is tested separately, the school organizational innovation atmosphere has a positive and significant predictive effect on artistic creativity (β = 0.708, t = 11.990); It can be seen from 4-4 and 4-6 that when the flow experience is introduced into the model, the school organizational innovation atmosphere has a positive and significant predictive effect on the flow experience (β = 0.877, t = 8.814); Flow experience has a positive and significant predictive effect on artistic creativity (β = 0.935, t = 7.485); however, the effect of the school's organizational innovation atmosphere on artistic creativity disappears (β = -0.123, t = -1.075). With reference to Baron and Kenny (1986)'s judgment on the mediating effect, this study believes that the flow experience plays a completely mediating role in the perception of the innovative atmosphere and artistic creativity of the school organization by college students.

V. CONCLUSIONS AND RECOMMENDATIONS

(Sawyer Keith, 2017) [18] I believe that effective creative teaching models can be found in the practice of art and design education. Many countries are also working hard to change school education methods to produce creative teaching

results and train students to become creative individuals. For these reason, our government and education departments have repeatedly emphasized that universities should pay attention to cultivating the creativity of college students. It cannot be ignored that the cultivation of creativity of art majors is a systematic project, and most of the artistic creativity emerges after a process of design thinking formation. From the previous hypothesis verification results of the model of the influence of school organization innovation atmosphere and flow experience on artistic creativity, it can be seen that the school organization innovation atmosphere and flow experience have an important effect on artistic creativity. Therefore, we use virtual reality to create a virtual atmosphere of artistic innovation and flow experience artistic conception, and improve the effect of cultivating college students' artistic creativity. Several important steps in this process constitute this college student's artistic creativity training model. Therefore, we will explore how virtual reality can play a greater potential in the process of art professional education. as shown in Fig. 8.

A. VR Mode Training

In the "National Medium and Long-term Education Reform and Development Plan Outline (2010-2020)", China pointed out: "Information technology has a revolutionary impact on education development and must be highly valued" (Zhang Yuxia, Liu Yanhui & Zhang Zhigang, 2020) [19]. Based on this research, virtual reality technology is applied to art design professional education, to build a model to enhance the artistic creativity of college students, and to experience the traditional art form of the digital space of painting art through creative practice specific. First, the artist’s masterpieces are moved into VR equipment, and the two-dimensional perspective space of traditional art works is restored to three-dimensional space, so as to convey the artist’s psychological state when creating. Students can examine the art works in the virtual space from any angle, sort out, compare, and recreate them. Students will directly interact with the three-dimensional model of their own work, replacing the previous procedural computer operation. This will infinitely increase the degree of creative freedom and completely open up students' creative thinking. Secondly, the VR space experience allows students to enter the flow state to face the design theme content in a more relaxed and self-reliant way, overcome the resistance of habitual thinking to new thinking, and cultivate flexibility in creativity. Third, upload current popular information, works of famous artists, teacher’s recordings, notes, and creative ideas to the VR system, which not only facilitates the sorting and recall of knowledge, but also forms their own creative ideas after digestion and absorption, and design works uploading to the VR device can not only expand the artistic vision and ideas, but also improve the ability of art evaluation and appreciation, thereby improving the artistic creation and artistic accomplishment of teachers and students.

B. Training Mode Combining Theory and Practice

Art academies can specifically provide art-related for teachers and students with a space that is conducive to creation. According to the characteristics of the art design curriculum, it adopts a comprehensive teaching form in which multiple methods such as unit type, cross type, tutor consultation type and studio coexist(Dai Lei & Yin Baoying, 2020) [20]. In the studio, the sketches are exchanged on-site, each students can expresses their opinions, brainstorms to revise and improve the final draft, and builds a bridge between students and the society through the studio. The inspiration of artistic creation often flashes in practice and exploration. Students can experiment with any fantastic or absurd concept without the constraints of subject first, and gradually form a distinctive visual communication language. This requires the joint efforts of teachers and students, for both basic and specialized courses, both practical and creative courses can be integrated practice, to open up a borderless and open development space for art and design education. Teachers can guide students to participate in social practice: participating in design competitions organized by authoritative organizations, participating in public design bids by enterprises, enter the company to participate in actual design projects. Under this kind of education mode, students can not only learn more professional knowledge, but also have quite deep theoretical literacy, and they can also master more proficient practical operation ability. contemporary society needs high-level compound talents who understand both art and technology. Find the integration point between the majors in the topic setting and homework requirements, integrate the creativity of art design into teaching and life, gradually improve the level of creativity of students, maintain students' curiosity and creative motivation, and form in the setting of practical forming. classroom-craft room-social practice" and other multi-dimensional training modes, cultivate the art and design creative talents urgently needed in the society and the market.

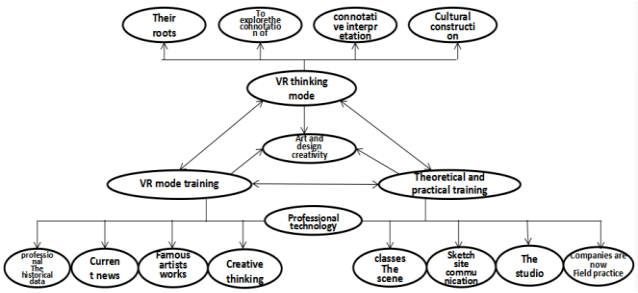


Fig. 8. Research model diagram: The cultivation model of artistic design creativity.
Source: drawn by the researcher

C. VR Thinking Training Model

1) Tracing to the source. The first step in art design is to find out the root of the design, that is, to explore people's thinking about the underlying consciousness of the object.
2) Explore the connotation

The connotation exploration is the imagery form collected from the previous tracing of roots. The connotation derived from the analysis is the soul of the art design work, and the original value of the work is realized.

3) Connotation interpretation

In the process of artistic creation, when the essence of artistic design is determined, it must be an external form of expression to present his essence before us. This is also an inevitable transformation process that exists in the process of artistic design. In this process, the essence of artistic design, from color to form, must start from the essence of artistic design conception and meet the requirements of artistic design, so that the original artistic design concept can be accurately transformed into the final design work.

4) Cultural construction

The content, definition, category, and environment of art design works keep pace with the times. Through accumulated wisdom, the foundation of cultural heritage is constructed, and the stability and cultural persistence of art design works established through integrated thinking can be firmer established. Only this kind of creativity based on the concept of permanence or continuity can meet the requirements of the new era.

As a brand-new art medium, virtual reality painting technology has promoted the creation of painting art from a traditional plane carrier to a higher dimension, closer to the realm, and is a brand-new art form(Xu Jingwen & Zhan Lei, 2020) [21]. VR painting art not only allows the creator to be in the imagination of the artist, but also reduces the distance between the public and the art(Guan Qin, 2020) [22]. the introduction of VR technology can well assist the art design professional teaching and can provide strong technical support for cultivating more socially applied talents(He Kui, 2019) [23]. Art major education relying on virtual reality technology to cultivate the artistic creativity of art major college students is a brand new attempt. in the future, I will deeply explore the relationship between the flow experience of painting creation and artistic creativity using the VR painting system architecture of HTC Vive+Titl Brush.

This research suggests: 1. It is recommended that art universities increase capital investment in VR equipment to promote faster and better development of art professional education; 2. Teachers should make full use of the VR art design teaching platform that combines virtual and reality to promote information technology and The deep integration of art professional education in colleges and universities (Zhou Yi, 2021) [24]; 3. it is recommended that other professional researchers try the integration of related professional education and VR technology application to expand their professional development space.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Wei-Ying WANG was responsible for the overall design and data analysis process of the study. Li-Chu TIEN was responsible for the conduct of the study and Data review. Yu-Qi DU. was responsible for the data collection process of the study.

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