Schema Interaction Visual Teaching Based on Smart Classroom Environment in Art Course

Guanyu He
University of Science and Technology Liaoning, Liaoning, China
heguanyu_1886@163.com

Abstract—With the progress and development of times and society, comprehensive art quality has become an indispensable part in the knowledge structure. As a required course in the education stage, art course is of great practical significance for improving the personality and intelligence. But traditional teaching tends to cultural course. The structural design of art course is signal, and the learning efficiency is low. At present, art course is one of key courses in the course reform. Based on this, this study proposed a schema interaction visual teaching model based on smart classroom environment. Firstly, teaching design of concept map form, discussion between the teacher and students, notes taking area, knowledge structure tree, knowledge review and self-evaluation area were established. Meanwhile, smart cloud service technology was applied to collect, transmit and analyze the teaching data of concept maps so as to develop a set of individualized course learning resources. After the integration, the teaching design includes three stages: establishing the cognitive map, guiding conceptual cognition integration and evaluating learners' transfer and application ability. In addition, multiple coding types of Flanders Interaction Analysis System were employed in this study, and the interaction between human and technology improved according to the smart classroom environment. In the meantime, codes 16-24 added were expressed, and the subsystem of art course teaching interaction formed. According to the teaching example of art course, the proposed teaching method can motivate students' art potential and promote the development of their higher-order thinking ability, so it is accepted by both teachers and students.

Keywords—Art course; smart classroom; schemata interaction; Flanders Interaction Analysis System.

1 Introduction

Art education is a process in which people recognize the nation and human cultural art. The national cohesion, creativity individuality and intellectual wealth potential awareness that art education forms cannot be replaced by other education methods. Art course not merely improves students' cognitive competence for beauty, but also can cultivate students' taste and make their personality better. While fully feeling the beauty of art and mastering the thinking mode of art, students can learn and grow in a

comprehensive manner [1]. Hence, as a required course in the education stage, art course has become one of key courses in the course reform.

However, the education of art course has been a weak point in China. Current teaching mode is traditional, and the teaching method similar to cultural course makes it difficult for students to really experience and feel the charm and thinking mode of art. Besides, the teaching idea of art course lags behind. Thus, the reform of art course teaching method is pressing [2]. With the rapid development of internet technology, online learning has become a trend. Especially for art course, online teaching mode can offer more materials and interaction forms so that students can visually understand the essence of art [3]. On this basis, smart classroom learning environment was used in this study to creatively set up an intelligent teaching model for knowledge construction and discussion. Besides, schema interaction visual teaching strategy was combined. The intelligent teaching model puts particular emphasis on visual guidance of graphical interface type, expresses some implicit theories and knowledge explicitly through the schema theory and focuses on students' knowledge understanding and intuitive feeling. On this basis, the interaction analysis coding system of smart classroom was constructed. This study plans to solve the problems in art course teaching through this new teaching strategy and provides a new thought for modern art education.

2 State of the Art

The school art education in the developed countries like Europe, America and Germany develops early, and their teaching idea has their unique foundations of psychology and philosophy. Hence, art education ideas and teaching methods of foreign schools embody distinct personalized features [4]. Foreign schools often pay great attention to traditions, religions, folks and nations in art courses, and attach importance to artistry and individuality expressed in various art elements and the aesthetic process. For example, Getty Center for Arts Education formally put forward the concept of "subject-based art education" on the "subject-centered" theoretical basis [5]. The main content comes from four basic art subjects: art making, art history, art criticism and aesthetics and aims to expand students' art knowledge and improve their aesthetic experience. Russian art education highlights learners' individuality spirit and individuality ability, and has very strict requirements for art teaching. Except pursing preciseness, Russian art education arranges the periods as many as classroom teaching periods in the course setting for students to carry out inquiry-based learning. In the art education course of American schools, teaches often organize students to conduct art practice activities, such as going to museum and art gallery and conducting a survey, and integrates campus and off-campus teaching [6]. Such teaching form which forms the synergy in art education can provide favorable social conditions and art learning atmosphere for art education. Van Hover & Yeager [7] applied the objective-based teaching method in online art course, and through analysis and practice, the team constructed an observation frame of education foundation, reform, education connection and consistency. The results show that,

objective consciousness teaching contributes to improving the teaching effect. Jess et al. [8] proposed a virtual learning environment applied in creative arts teaching design to enhance blended learning, and it was found that the redesigned sustainable mode could enhance learning efficiency. In terms of teaching resources, overseas art teaching teams include professional teachers with strong theoretical foundation and part-time teachers with rich practical experience. For instance, the most teachers in Juilliard School are musicians of New York Philharmonic and the Metropolitan Opera who not merely have profound foundation of music theory, but also possess abundant practical experience, so they can better combine theory and practice in the teaching process [9].

Relatively speaking, art education started late in China and there are some defects. At present, art education has been one of key courses in the school education reform. Xu & Gil [10] pointed out numerous problems in the college art course, like unclear teaching objective, and underscored the necessity of art reform. Zhu et al. [11] constructed "integrated" course teaching model based on computer digital technology in the major of digital media art, and gained good teaching results. Hu [12] came up with the application of small-class teaching model in college public art education, and proposed the teaching implementation program of optimizing course setting, enhancing teaching resource integration and sharing, and utilizing information means to expand classroom. It was found that, the small-class teaching model could better enhance students' learning interest. With the development of internet, numerous domestic and overseas scholars put forward the concept of smart classroom. Guo [13] considered the development of smart classroom as an inevitable trend and proposed a smart teaching environment through applying big data analysis and analyzing the results so as to improve teachers' teaching methods, which brought great convenience for communications between students and teachers. Hu [12] proposed that educators should not merely focus on smart classroom equipment construction, but should pay attention to the rational application of smart classroom. The above teaching experience offers a new thought for art course reform. This study innovatively put forward schema interaction visual teaching strategy based on the smart classroom environment, and aims to bring new teaching experience for students by combining new teaching interaction modes based on the smart classroom and apply it in the art course.

3 Application of Schema Interaction Visual Teaching Strategy Based on the Smart Classroom Environment in Teaching

3.1 Model building of smart classroom environment in teaching activity

The activity theory originated from classical philosophy. Later, psychologists continuously improved it to make it mature. Finally, the basic structure model of activity was gained, as shown in Fig.1. The basic structure model of activity forms a system which includes six elements: subject, community, object, work division, rule and tool. The six elements interact and also form four subsystems, including

production subsystem, exchange subsystem, consumption subsystem and distribution subsystem.
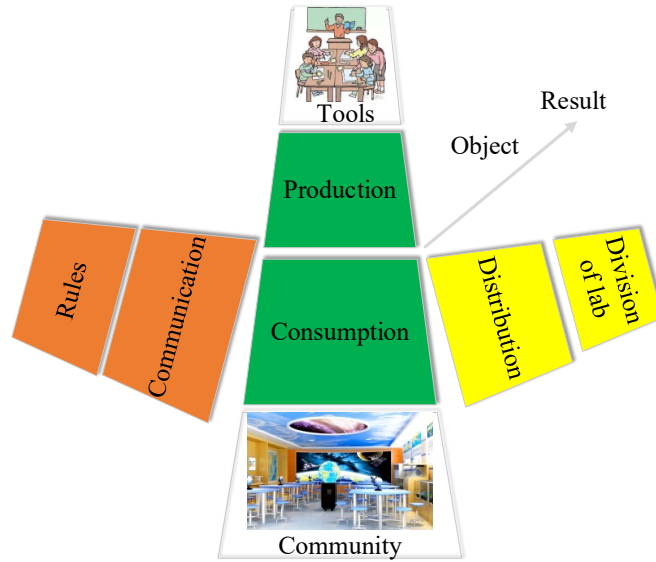

Fig. 1. Basic structure model of activity theory

As shown in Fig.2, students and the teacher jointly form a learning community which works on the object target and learning resources in the intelligent cloud service platform according to the rules to form four subsystems.

In the exchange subsystem, students and the teacher jointly form a learning community which learns, exchanges, interacts and shares in teaching activities according to the rules. The production subsystem forms through three modules of the intelligent cloud service platform. The data acquisition module mainly collects students' pre-class-in-class-after-class behavior data. The data analysis module mainly applies data mining technology and data analysis technique to analyze the data gathered. The distribution subsystem is used to push learning resources according to the result of production subsystem and reflects intelligence. The consumption subsystem means in the teaching activities under the smart classroom environment, both students and the teacher will be influenced by the environment and need to make adjustments continuously, which will consume more energy of the community and the subject.
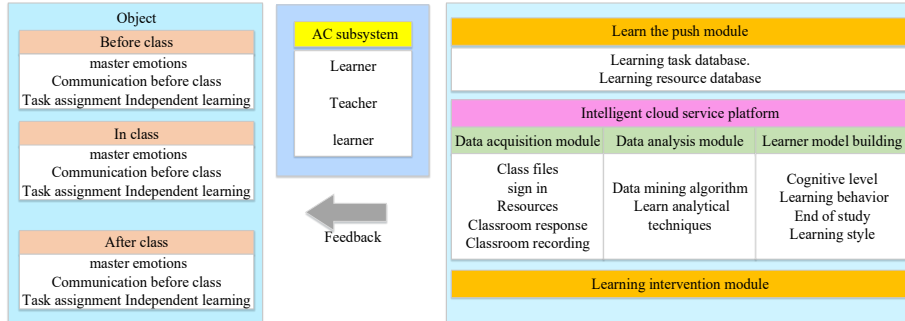
Fig. 2. Teaching activity theory model under smart classroom environment

3.2 Implementation of schema interaction visual teaching strategy in art course

The selection process of schema interaction visual teaching media is shown in Fig.3. In teaching activities, it is necessary to choose corresponding media according to actual classroom needs and requirements to make classroom learning more efficient. As shown in Fig.3, we can choose media according to whether only visual form is required, whether only audio form is required, whether both audio and visual forms are required and whether it is netter to simulate the activity. The specific process is shown in the figure, and it is no longer described here. Media selection provides the possibility of interaction and exchange for teachers and students and lays a foundation for flexible online teaching.
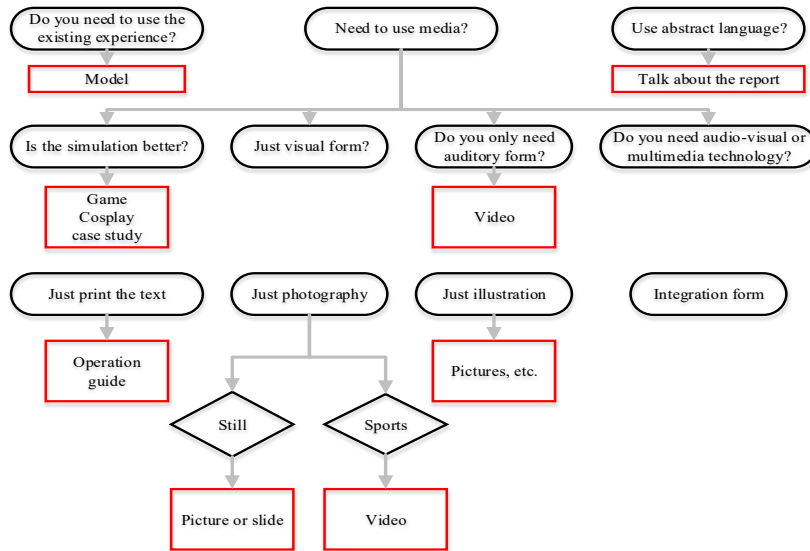

Fig. 3. Selection of schema interaction visual teaching media based on smart classroom

The schema is a cognitive structure of the subject. Visualization can convert dull data into visual and vivid graphs through internet technology. Schema interaction visual teaching refers to a new teaching model based on the internet technology, which places particular emphasis on visual guidance of graphical interface form and can express some implicit theories and knowledge explicitly through the schema theory so that students can understand and perceive more intuitively. Such new teaching strategy can guide and promote deep-level communication and exchange between teachers, between teachers and students and between students so as to improve teaching effect and classroom quality to a new level. Schema interaction visual teaching will produce different degrees of influence on teaching researchers, teachers and students. For teaching researchers, such teaching method can bring them information about new learning structures and teaching structures and facilitate the development and innovation of teaching theory. For teachers, the new teaching method and strategy will certainly bring some new classroom interaction and teaching environments, and can well help improve students' learning initiative. For students, they can understand boring and profound theoretical knowledge more visually and vividly, think and analyze problems from different perspectives. Such learning atmosphere can let students really "feel happy in learning".

The concept map is a teaching technique. The application of concept map technology can significantly boost students' thinking ability. When the concept map technology is used under schema interaction visual mode, it is necessary to first integrate learning resources required and then draw corresponding concept maps. Teachers can carry out teaching design, show the teaching content and learn about students' mastery of knowledge through the concept maps. Students can use concept maps to take notes, construct knowledge structure, review knowledge and assess themselves.

3.3 Implementation plan of schema interaction visual teaching based on smart classroom environment

From the activity theory and basic structure model of activity, we can find that the teaching activity in smart classroom environment is composed of human factors (subject, object and community) and technical factors (object, tool and rule) (as shown in Table 3.1). The subject of the activity is leaner, and the object is learning resource and objective. The community is promoter (teacher) and cooperator (classmate). The tool includes cloud service platform, terminal and teaching network platform. The rule includes smart classroom use rules and interaction rules.

Table 1. Elements of teaching activity in smart classroom environment

Human factors	Subject	Learner
	Community	Promoter (teacher), cooperator (classmate)
Technical factors	Object	Learning resource, learning objective
	Tool	Cloud service platform, intelligent teaching platform, intelligent terminal
	Rule	Smart classroom uses specifications, peer interaction rules

In the classroom teaching activity based on the smart classroom environment, various elements promote each other and interact and present certain dynamics. The teaching design based on the smart classroom environment is subject to the theory of constructivism. It breaks the phenomenon of traditional classroom teaching. The teacher is no longer the only dominator and communicator of knowledge, but organizes the teaching activity and gives certain help. The teacher helps students learn, complete knowledge construction and transform classroom knowledge into skills and wisdom through intelligent equipment and techniques. Learners are the center of the teaching activity based on the smart classroom environment. Students no longer passively receive knowledge in classroom. Through the tools provided by the smart classroom environment, students' creativity can be better motivated and they thus become the active builders of knowledge significance. Certain deviation and error may exist in individual knowledge construction, so learners need to communicate and discuss with the learning community (including teachers and peers) to gain the reasonable results and achieve correct knowledge construction. Traditional classroom teaching puts emphasis on knowledge communication and teaching, while the platform of knowledge construction and discussion is set up for students through the intelligent technology in the teaching based on the smart classroom environment. In this way, teachers and students can learn and grow together.

The schema integration visual teaching plan based on the smart teaching environment is shown in Fig.4. The internet technology is applied for timely data collection, transmission and analysis, and individualized course learning resources and concept map technology of schema integration visualization are perfectly combined. Before class, students form online groups to draw theme concept maps, and the schema visual platform for diagnosing learners' concept cognition is set up. In class, teacher-themed concept maps and student-themed concept maps are displayed and compared. The teacher and students cooperate and interact to set up the conceptual visual integrated platform to guide learners. After class, students and online learning groups independently interact, draw extended theme concept maps and complete learning tasks. Besides, the visual platform for evaluating leaners' transfer and application ability is set up. The three visual platforms make the whole teaching activity more complete, make teaching design more creative and let students and the teacher interact in a more effective and individualized way. Further, an efficient and creative classroom which can enhance thinking ability forms.

Teaching link	Before class		
Teaching strategies Smart classroom support Interaction Visualization platform	Students group concept map drawing Release teaching tasks Cooperate and communicate		
	learners' conceptual cognition		

Teaching link	In class		
Teaching strategies Smart classroom support Interaction Visualization platform	Concept map evaluation	Concept map filling	Concept map comparison
	Display and comment	Testing	comment
	Communication		
	integrate cognition		

Teaching link	After class		
Teaching strategies Smart classroom support Interaction Visualization platform	Students cooperate and communicat Students interact independently Publish learning tasks Visualization platform		
	Evaluate the application ability		

Fig. 4. Schema integration visual strategy based on the smart teaching environment

The smart teaching environment provides the special live streaming course system through the intelligent cloud service platform, from which the teacher and students can gain learning resources. Besides, the system supports such functions as uploading, downloading, commenting, creating subtitles and playing multimedia files so that the teacher and students can interact in time. To test the feasibility of schema integration visual strategy based on the smart teaching environment, Expressive Force of Lines in the art course was taken for example.

Step 1: student-themed concept map design before class in smart teaching: establish visual concept maps of art course.

Before class, learners should understand the course content and draw the theme concept maps through the online learning resources. Then, they discuss in the online learning group, draw the theme concept maps and submit them to the teacher via the online system to complete pre-class preparation. The teacher then designs corresponding teaching objectives according to the submitted theme concept maps. The theme concept maps are shown in Fig.5. It can be seen from the theme concept maps that, students have mastered that lines exist in our daily life and the nature, and that there are many kinds of lines. But students neither distinguish tangible and intangible lines nor pay attention to the effect of lines on emotional expression. For the theme concept maps drawn by students, the teacher designs corresponding teaching objectives to let students understand characteristics and expressive force of lines in art.
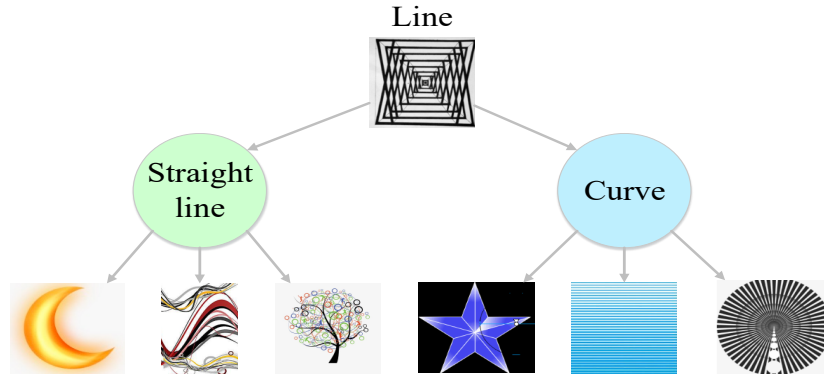
Line

Fig. 5. Student-themed concept maps

Step 2: teacher-themed concept maps in class of the smart classroom: visually guide learners' concept cognition and integration.

In class of the smart classroom, students use the display function in the cloud service platform to show their theme concept maps. Students and the teacher evaluate the maps, evaluate them and point out the advantages and shortcomings. The teacher publishes and displays theme concept maps in class, as shown in Fig.6. In the meantime, the teacher fills in the deficient content in the teacher-themed concept maps together with students and conducts comparative analysis to let students remember more profoundly. In the whole teaching process, the teacher should closely focus on the theme, create situations, guide students for interactions and motivate their thinking. For excellent students' speeches and works, the teacher should praise and display them.

Fig. 6. Teacher-themed concept maps
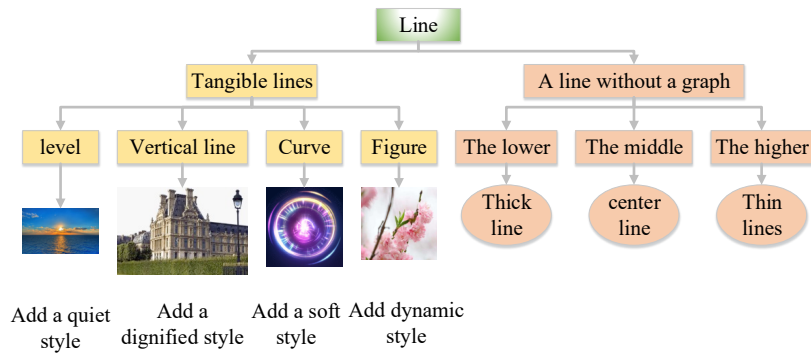
Step 3: extended theme concept maps after class of the smart classroom: visually evaluate learner's transfer and application ability.

The teacher publishes after-class tasks, and the online group draws corresponding extended theme concept maps after discussions. Students extend for intangible line expression. Apart from music mentioned by the teacher, intangible lines are also

reflected in dance, gymnastics and martial arts. For example, popping expresses strong liens, while Tai Ji and classical dancing express soft lines. All these embody emotional expressive force of lunes. These lines in art performance are composed of coherent movements and rhythm. In the end, the teacher evaluates students' extended theme concept maps, give reasonable suggestions, award excellent students and record the results.

4 Teaching Example and Effect

4.1 Teaching example

The schema interaction visual teaching experiment based on smart teaching environment was conducted in the art course of art major in Liaoning Province. The objects of study came from three classes in the freshman year, and each class had 43 students, including 20 boys and 23 girls. One class was given the schema interaction visual teaching experiment based on smart teaching environment, while the other two classes received traditional classroom teaching. 10 lessons of art course recorded under the smart classroom environment were chosen as the research samples, and the specific sample number and corresponding course are shown in Table 2.

Table 2. Recorded video samples of art course based on smart classroom environment

Sample No.	Course
Ys1	Art Course 1
Ys2	Art Course 2
Ys3	Art Course 3
Ys4	Art Course 4
Ys5	Art Course 5
Ys6	Art Course 6
Ys7	Art Course 7
Ys8	Art Course 8
Ys9	Art Course 9
Ys10	Art Course 10

The analysis system reserved multiple coding types of Flanders Interaction Analysis System, and human-technology interaction in the technical language was improved according to the smart classroom environment. The added Codes 16-24 were described in detail, as shown in Table 3.

Table 3. Analysis of art course teaching interaction based on the smart classroom environment

Classification		Alias of code	Code	Content	Specific description
Teacher's speech	Direct influence	T	1	Accept emotion	......
		T	2	Encourage and praise	......
		T	3	Adopt ideas	......
		T	4	Ask open questions	......
		T	5	Ask closed-end questions	......
		T	6	Explain	......
	Indirect influence	T	7	Organize and instruct	......
		T	8	Criticize	......
Students' speech		S	9	Passively respond	......
		S	10	Actively respond	......
		S	11	Actively ask questions	......
		S	12	Exchange and cooperate	......
		S	13	Evaluate with words	......
Silence or confusion		C	14	Pause or confusion which is not beneficial to teaching	......
		C	15	Silence which is beneficial to teaching	......
Technical speech	Teacher's techniques	TT	16	Call the roll and group	......
		TT	17	Operate the display content	......
		TT	18	Write on the blackboard and mark key and difficult points	......
		TT	19	Analyze learning situation	......
		TT	20	Display and evaluate students' results	......
	Students' techniques	ST	21	Resource learning	......
		ST	22	Independent exercise	......
		ST	23	Share and display creations	......
		ST	24	Student assessment	......

The classroom observation sheet was formed by coding and recording 10 sample lessons at the interval of 5s. The coding rules are as below: (1) record all behaviors within 5s and select the behaviors different from the last 5s; (2) dictation in group cooperation and exchange is expressed with 10, and multimedia display is expressed with 23; (3) when the teacher uses the platform to display the learning content, it is expressed with 17; when technical means is used to teach, it is expressed with 6; when the teacher uses technical means to guide students for other teaching activities, it is expressed with 22.

Both the horizontal coordinate and vertical coordinate are 24 types of codes and form 24-order transfer matrix, as shown in Table 4. The data were filled in. The data filled in are the ordered pairs consisting of each code, the last and next codes.

Table 4. Transfer matrix of art course teaching based on smart environment

Category	Teacher's speech						Students' speech				Silence		Technical speech			
	-	1	2	3	…	8	9	10	…	13	14	15	16	17	…	24
Teacher's speech	1	-	1	5	…	0	0	3	…	0	0	0	0	0	…	0
	2	-	15	1	…	0	0	1	…	0	0	0	0	0	…	0
	3	5	1	42	…	0	0	13	…	0	0	1	0	0	…	0
	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
	8	0	0	0	…	0	0	0	…	0	0	0	0	0	…	0
Students' speech	9	-	-	-	…	0	0	0	…	0	0	0	0	0	…	0
	10	7	2	23	…	0	0	165	…	0	0	0	0	0	…	0
	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
	13	0	0	0	…	0	0	0	…	0	0	0	0	0	…	0
Silence	14	0	0	0	…	0	0	0	…	0	2	0	0	0	…	0
	15	0	0	0	…	0	0	0	…	0	0	0	0	0	…	0
Technical speech	16	0	0	0	…	0	0	0	…	0	0	0	0	0	…	0
	17	0	0	0	…	0	0	0	…	0	0	0	0	3	…	0
	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
	24	0	0	0	…	0	0	0	…	0	0	0	0	0	…	0

The specific computational formula is shown in Table 5. Wherein, row(i) represents the sum of the data in the ith row of the matrix; col(j) represents the sum of the data in the ith line of the matrix; total refers to the sum of all elements in the matrix. If $cell(i,j)$ represents the data in the ith row and the jth line,

$$row(i) = \sum\nolimits_{j=1}^{24} cell(i,j)$$

$$col(j) = \sum\nolimits_{i=1}^{24} cell(i,j)$$

$$total = \sum\nolimits_{i=1}^{24} \sum\nolimits_{j=1}^{24} cell(i,j)$$

Table 5. Computational formulas of art course ratio based on smart environment

Category	Speech and behavior ratio	Category	Speech and behavior ratio
Teacher's speech	Teacher's speech ratio T_L	Technical speech	Technical speech ratio TS_L
	Ratio of indirect influence to direct influence T_L（i_d）		Teacher- technology ratio TT_L
	Teacher's question ratio T_Q		Ratio of calling the role and grouping TT（n_g）
	Ratio of closed-end questions to open questions T_L（c_o）		Ratio of operating display content TT（o_c）
Students' speech	Students' speech ratio T_L		Ratio of writing on the blackboard and marking key and difficult points TT（w_m）
	Passive response ratio S_P		Ratio of analyzing learning situation TT_A
	Active response ratio S_I		Ratio of displaying and evaluating students' results TT（s_e）

	Ratio of active questioning S_Q		Student - technology ratio ST_L
	Ratio of exchange and discussion S_D		Resource learning ratio ST_R
	Speech evaluation ratio S_E		Ratio of independent exercise ST_P
Silence and chaos	Silence and chaos ratio C_L		Ratio of sharing and displaying creations ST（s_s)
			Ratio of student assessment ST_E

1. Task arraigment before class: students understand relevant knowledge of art course through online video, document and audio and draw student-themed concept maps according to course requirements and content. After being familiar with corresponding knowledge background, students discuss in the online learning group and drawn the theme concept maps. For the theme concept maps, the teacher designed corresponding teaching objectives to let students understand characteristics and expressive force of lines in art.

2. In class of smart classroom: the teacher first plays some life pictures and asks students to find out the lines and express their visual feelings brought by different lines so as to introduce the theme. The next step is concept map display. Students use the display function on the system to show their theme concept maps. Students and the teacher comment the theme concept maps through creating subtitles and making comments, and indicate the advantages and defects or mistakes. Through the comment system of the system, students can speak out freely. The teacher promotes the exchange and evaluates students' concept maps. The teacher publishes teacher-themed concept maps in class, fill in the deficient content in the teacher-themed concept maps and conduct comparative analysis together with students to let students remember more profoundly.

3. Knowledge extension task after class: the online groups are required to review the knowledge learned in classroom, find out the composition of different lines in daily life, reflect on and discuss the expressive force of lines in art as well as draw extended theme concept maps. Each online group evaluates mutually to point out advantages and shortcomings and give the final assessment. The teacher picks out excellent works for presentation, and gives awards.

4.2 Teaching effect

43 students in the experimental class were surveyed with the questionnaire. For the adaptation of schema interaction visual teaching classroom based on the smart teaching environment is shown in table.6. 5 students were difficult to adapt to it, and 10 considered it general, while 26 could adapt to it well. It can be seen that most students could well adapt to such teaching environment.

About whether students can effectively learn knowledge in the schema interaction visual teaching classroom based on the smart teaching environment, the results are shown in table.6. 11 students expressed negative impacts, and 1 considered there was no impact, while 31 felt positive effects.

Table 6. Teaching effect evaluation

Question.	Option	n	Percent
Can you adapt to the new teaching mode	Well adapted	26	60.5%
	Commonly	10	23.2%
	Difficult to adapt	7	16.3%
Can you learn more effectively	Positive impact	31	72.1%
	No impact	1	2.3%
	Negative effect	11	25.6%
Influence on classroom attention	Focus attention	20	46.5
	Commonly	5	11.6%
	Distraction	18	41.9%
Improve the interaction enthusiasm	Yes	41	95%
	No	2	5%

As shown in table.6, in the survey of classroom attention, 18 students considered their attention would be distracted and 5 expressed no influence, while 20 thought they could pay attention. This result shows that the teaching under such model differentiates the influence on students' attention. Nearly half students would divert attention, which should be noted.

Compared with traditional teaching model, the teachers interviewed considered that there were 3 advantages for the visual teaching model based on the smart classroom environment: 1. The smart classroom environment allows teachers to gain more materials so as to bring new thoughts for teaching design; 2. Through the intelligent functions provided by the smart classroom, students and teachers can interact more actively, and the interaction is full of interestingness. In the interaction process, students continuously reconstruct knowledge in the interaction and further learn effectively; 3. Through the schema interaction, the theory can be displayed more systematically, which trains students' operational ability and thinking generalization ability. Through the information technology, the difficult theoretical concept can be displayed visually to guide students' active thinking, diverge their thinking and improve their creativity.

5 Conclusion

Art course can improve students' humanistic quality and aesthetics, which is an important course to let students develop in an all-round way. This study introduced the construction of smart classroom in teaching activities, teaching media selection and the application of schema theory in schema interaction visual teaching under the smart classroom environment. The schema interaction visual teaching example based on the smart classroom environment verified that this teaching model provided convenience for teachers and students to gain rich resources, also offered new thoughts for teaching methods and brought interestingness for the classroom. Meanwhile, it greatly enhanced students' interaction enthusiasm and improved their creativity. But there are also some defects. Under the smart classroom environment, students' attention may be easily diverted, and too many function resources will

distract attention. Thus, teachers need to urge and remind students continuously. Moreover, the smart classroom environment has high requirements for network and system stability, which will influence the experience of teachers and students. These problems will be investigated and addressed in the future work.

6 References

[1] Ren, Y., Jiang, X. A Mind Map Teaching Mode for Sports Anatomy based on 3DBody. International Journal of Emerging Technologies in Learning, 2019, vol. 14(10), pp. 4-17. https://doi.org/10.3991/ijet.v14i10.10776

[2] Thienhaus, Erich. Principal Considerations on the Artistic Qualities of Musical Sound. Journal of the Acoustical Society of America, 1956, vol. 28(4), pp. 790-791. https://doi.org/10.1121/1.1918282

[3] Paul, R., Julie, K., Astrid, S., Jordana, L., & Anastasia, L. The development of shared liking of representational but not abstract art in primary school children and their justifications for liking. Frontiers in Human Neuroence, 2016, vol. 10, pp. 21. https://doi.org/10.3389/fnhum.2016.00021

[4] Valva, M.D. Matter Matters: An Unsolved Problem in Boccioni's Art and Poetics. Getty Research Journal, 2017, vol. 9, pp. 93-110. https://doi.org/10.1086/691289

[5] Galvez, G. V., & Blanch, J. P. (2016). History teaching practice based on purposes to teach: Mariana case. Educational Review, vol. 32(3), pp. 349-371.

[6] Herne, S. Communities of practice in art and design and museum and gallery education. Pedagogy Culture and Society, 2006, vol. 14(1), pp. 1-17. https://doi.org/10.1080/14681360500487512

[7] Van Hover, S., Yeager, E. Challenges Facing Beginning History Teachers: An Exploratory Study. International journal of social education, 2004, vol. 19(1), pp. 8-21.

[8] Jess, P., Vidya, K. Best-practice model for technology enhanced learning in the creative arts. Research in Learning Technology, 2016, vol. 24(1), pp. 1-16.

[9] Elham, T.H., & Aida, H. A. Challenges to teaching english literature at the university of hail: instructors' perspective. social science electronic publishing. 2017, vol. 7(4), pp. 125-128.

[10] Xu, L., & Gil, N. Librarians as co-teachers and curators: integrating information literacy in a studio art course at a liberal arts college. Art Documentation Journal of the Art Libraries Society of North America, 2017, vol. 36(1), pp. 122-136. https://doi.org/10.1086/691376

[11] Zhu, L. The construction and research of "integration" teaching mode based on Digital Media Art Course. Art Science and Technology, 2016, vol. 29(12), pp. 359.

[12] Hu, L. On the Teaching and Reform for Artistic Designing Speciality in Colleges and Universities. Journal of Huaihua University, 2005, vol. 24(3), pp. 123-124.

[13] Guo, H.B. Research into the Practice of Teaching Small Classes in Macao. International and Comparative Education. 2009, vol. 31(6), pp. 62-66.

7   Author

Guanyu He is an associate professor in the University of Science and Technology Liaoning, Liaoning, China (heguanyu_1886@163.com).