Design Classroom Teaching Reform based on Computer-Assisted Instruction: From "Presupposition-Execution" to "Presupposition-Generation"

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Abstract. In the design class, the theory system of presupposition generation based on CAI is constructed, which includes three parts: online and offline implementation scheme, quality evaluation standard and practice test. It reveals that the essential attribute of generative classroom is the balance between teachers and students' power and responsibility. This provides a theoretical basis and case reference for the design classroom teaching reform, and also provide a new research perspective for the innovation of design education.

Keywords. Computer-Assisted Instruction; divide classroom; divide power and responsibility; design class

1. Introduction
On October 31, 2019, the Ministry of Education issued "opinions on the implementation of the first-class undergraduate course construction ", which put forward that "curriculum is the core element of talent training, and curriculum quality directly determines the quality of talent training ". The reform of classroom teaching process is the key to the improvement of curriculum quality. Ye Lan, director and doctoral supervisor of the Institute of Basic Education Reform and Development of East China Normal University, published the article Presupposition and Generation in Classroom Teaching Reform in the Journal of Basic Education Forum in 2012, and put forward the view that the core of classroom teaching process reform is to change 'presupposition and execution' into 'presupposition and generation' [1]. We should focus on the study of subjects, teaching contents and students' state in the course of classroom teaching, which has important enlightenment to the generative construction of higher education classroom.

The core of realizing the "double first-class" of higher education in China is to realize the cultivation of high-quality innovative talents. Then, the classroom teaching mode needs to have the fundamental change. The reform and innovation of university classroom teaching mode should break through the traditional "presupposition-execution" classroom and transform into generative classroom. It should focus on "student-oriented" rather than "teacher-centered" or "knowledge-based". Design specialty itself is the cradle of training innovative talents for the country and society. Design products should be "people-oriented", designers should pay more attention to their own creative thinking cultivation, "student-oriented" has become the design classroom to cultivate students creative design thinking presupposition. So, how to turn around and come out of the traditional role of teachers and students, From "presupposition-execution" knowledge-based classroom to "student-oriented"
generative classroom, it is a problem worth discussing in the teaching reform of higher design subject. Computer aided instruction has become an important means of design class. It is one of the necessary conditions to implement the bisection of design class with the help of computer-aided technology.

2. Key change to sub-class: from "presupposition–execution" to "presupposition–generation"
The creation of sub-classroom provides practical ideas for higher education teaching reform. In the past 400 years, the fundamental dilemma of modern education and teaching reform in the world is that the two paradigms of teaching method and discussion method have their own advantages, but they have been separated and can not be deeply integrated. Although the teaching method is systematic and efficient, but it is passive learning in essence, the discussion method, including PBL, case teaching, can enhance the students' initiative, but the systematic and efficient learning of knowledge is not enough. Based on the reflection of the above traditional teaching method, the teaching mode of "divided classroom" created by Professor Zhang Xuexin, Ph. D., Princeton University and Fudan University in 2014 is an original local idea.

Teaching is clearly separated into three processes: teaching (Presentation), internal absorption (Assimilation) and discussion (Discussion), so it is also referred to as PAD classroom[2]The advantages of both the teaching method and the discussion method are fully absorbed in the sub-class, In the form, the classroom time is divided into two parts, half for teachers to teach, half for students to discuss, in essence, a psychological internalization link is introduced between teaching and discussion, so that students can absorb the teaching content after extracurricular time. Be prepared to participate in the discussion in the next class [3]. By emphasizing the process of internalizing absorption, the two paradigms of teaching method and discussion method are integrated: teaching is based on the internalization of independent thinking, and the results of internalization are displayed, exchanged and perfected in the discussion through socialized learning, which not only ensures the efficiency of knowledge system transmission, but also gives full play to students' initiative [3]. So far, the sub-classroom has almost covered various subjects, such as humanities, science, medicine, sound and beauty, etc. It can be said that it provides a new educational paradigm for individualized learning in the information age.

To sum up, the important innovation value of sub-class is that it has truly realized the "knowledge-based" of higher education to "student-based ".That is, the traditional classroom "presupposition-execution" process, changed to "presupposition-generation" process. In the two teaching processes of teacher teaching and student discussion, it is clear that the power and responsibility of teachers and students are the relationship between points, and half of the teaching role in the classroom is given to the students, which is no longer the absolute control of the teacher. The orientation of this role greatly enhances the power of the students' main body and stimulates the students' learning initiative [4]. We should pay more attention to the teaching effect in the process of teaching and learning, avoid falling into the "teacher-oriented" and "knowledge-based" indoctrination teaching mode, and advocate full respect for the innovation and initiative of each individual in the classroom. This kind of classroom change seems to be the custom of the design classroom teaching reform, which coincides with the goal of training specialized innovative talents in the design subject.

3. The significance of classroom implementation in design
From the perspective of discipline development, design is still a very young subject in China, but it has developed for 20 years. The present situation of design higher education is not optimistic. Classroom teaching mode is generally rigid, and the teaching mode of "literature and history + painting" has many drawbacks, which obviously does not accord with the law of the development of modern design specialty, nor can it meet the needs of the rapid development of higher design education in China. Based on various difficulties, Professor Xin Xiangyang, School of Design, Jiangnan University, planned and co-hosted a series of international conferences on "Design Education Redesign" in 2012-2016. Once a year, by inviting more than a dozen experts and scholars from
different countries, more than 100 educational and business circles to give lectures and workshops, the conference provides an important academic exchange platform for the design of ontology, methods and value systems in the context of the new era [5]. At the practical level of teaching reform, Professor Xin Xiangyang advocated the concept of great design education. Under his leadership, the School of Design of Jiangnan University launched a series of professional reform measures to create a whole class teaching model. During the period of prevention and control of the new crown epidemic situation in 2020, in order to respond to the national call of "stopping classes and not stopping learning", information teaching has become the focus of research overnight. Due to the need of reality, with the help of various Internet teaching platforms, colleges and universities have introduced online teaching models, both in the theoretical level and in the classroom practice level, which has quickly reversed the weak trend of transforming the network classroom from the traditional classroom. It also brings more thinking dimensions to the reform of design classroom. The former provides a research sample for the qualitative change of design classroom, while the latter provides a technical environment. However, from the level of professional development, compared with other disciplines, the educational research of design major in China is still immature and insufficient. There is still a lack of individualized and systematic theoretical guidance on how to effectively improve the general situation of the current design class. It is under the background of modern design that design pairs divide classes and think about how to create classes innovatively.

From the aspect of teaching practice, the classroom teaching mode is old and innovative. Design major is more practical, generally including theoretical courses and technical courses. Many teachers have a single educational background, no enterprise experience, and use the traditional teaching method. Although multimedia teaching can push a large number of cases, it is mostly careless and lacks the explanation of empirical cases. It only temporarily conceals the boring and dull nature of teaching. The introduction of sub-class teaching method is timely for the innovation of classroom teaching mode of design major.

In summary, the implementation of design classroom is of great significance. On the one hand, it can consolidate the theoretical basis of "presupposition-generation" classroom under the background of large design education, and fill in the blank of design specialty practice. On the other hand, it will make the classroom quality realize the essential change to a certain extent [6].

4. Design-based sub-class presupposition and implementation
In 2019, the product design major of Huangshan College was successfully selected as the first-class undergraduate major construction project in Anhui Province. In the past five years, the whole teaching team of product design has been exploring the teaching reform practice of sub-class. In a series of educational reform measures and evaluation standards, the proportion of process supervision and evaluation of classroom teaching is increased. At the same time, the construction of school-based teaching materials for design major, the exploration of online and offline mixed teaching reform, the talent training scheme, the construction of teaching staff, the evaluation system of teaching quality and so on are carried out in depth. Finally, the teaching mode of "teacher studio + subject competition + scientific research development + enterprise entering" is formed. Teachers and students benefit a lot. In "Design Foundation", "Stereo Composition", "Materials and Technology", "Product Design Methodology", "Introduction to Design", "Quick Design", "Huizhou Folk Crafts", "Product Design", "Product Development and Design", "Graduation Design and Creation" and other theoretical and technical courses to implement the teaching of sub-classes. From the classroom feedback and student evaluation, praise such as tide. The learning effect is very obvious. Compared with the traditional classroom, the students' interest in learning is greatly improved, and their academic performance is rising all the way.

On the other hand, the author summarizes the main points of attention in designing the sub-class in presupposition and implementation, as follows:

4.1 Science presupposes the classroom.
The sub-class also needs to be set up in advance, do enough preparation work. It is necessary to use scientific thinking to set up the training goal, the definition of talent type, the composition of curriculum system and the relevant academic credit in advance, and at the same time, it also includes the construction of teaching methods, methods and quality evaluation, which are matched with the training mode of professional talents. In particular, we should explore and presuppose the nature of the curriculum, curriculum, content selection, teaching organization form, classroom form and examination evaluation, and design the chapter content, goal, means, organization form and quality evaluation of the teaching process in three parts according to the idea of equal rights and responsibilities of teachers and students in class.

4.2 Scientific grasp of the teaching principles of the sub-classroom.
Based on the four learning theories and three teaching theories, the teaching principles are refined into five categories: goal and motivation, teaching content, learning process, methods and strategies, and academic evaluation. The teaching principle of "student-centered" is put forward to express the more macroscopic theoretical orientation, and it is carried out and embodied in the teaching mode of divided classes.

4.3 Scientific exploration of the classroom teaching model.
Pay attention to the process research and decompose the teaching process in real time. For a specific, specific teaching objectives, focus on generating the types of teaching activities involved. This type of activity should be judged more from the behavior characteristics of teachers and students. Generally defined as the following four basic teaching models —— presentation mode, single learning mode, dialogue mode, discussion mode, these four basic models have their own characteristics, do not overlap each other, have their own unique value.

Presentation mode: mainly reflects the "teaching" method of divided classes. That is, action demonstration teaching, which refers to the behavior of teachers demonstrating specific painting movements or computer operations for students to imitate, so that students can learn the corresponding drawing skills, that is, what we often call "personal teaching ".This ancient cultural transfer behavior plays an irreplaceable role in the cultivation of drawing skills in the design classroom. It is one of the simplest, most commonly used and most effective intuitive teaching methods to use the presentation mode in the teaching environment. More demonstration and demonstration can attract students' attention and satisfy students' positive desire for knowledge and curiosity, and can pave the way for the discussion.

Single learning model: mainly reflects the "learning" method of divided classes. After careful deliberation and action by the teaching and research team, it is agreed that the more perfect curriculum reform begins with students studying alone. Learning alone is a test of our teaching methods. It is necessary for students to find problems and solve problems, and to use two-color pen to mark some questions and bring them into later discussion to solve problems. In the stage of single learning, teachers should pay close attention to students' self-study state. Respect the difference of students' ability to learn alone, and give guidance at the right time. For the students who are not self-conscious in learning alone, they can guide, promote and strengthen management through effective classroom learning evaluation and team building, and force them to gradually develop independent study habits [7]. In this process, the real implementation of the "student-centered" teaching concept.

Dialogue mode: mainly reflects the role of teachers and students in the classroom. It is through the equal dialogue and communication between teachers and students that the teaching activities transcend the content of knowledge and have the function of constructing knowledge and generating meaning. Both teachers and students will be promoted at the level of thought and knowledge. Dialogue mode is generally composed of a task-based activity, running through the discussion. In order to improve students' individual conversational skills, develop their positive expression, communication and social communication skills. The teaching mode of dialogue class is generally divided into six steps: preheating (speaking, learning and singing), knowledge elaboration, review and consolidation
(discussion, cooperation and co-construction, performance display), expanding application, evaluation and testing, and homework after class. Instead of emphasizing the authority and leading role of teachers, we should emphasize the quality of learning subjects' substantive participation in classroom life. Define the role of teachers and students according to the task requirements of teaching and learning in each step [6]. As the architect and organizer of the classroom activities, the teacher is responsible for the overall design and arrangement of the teaching activities of the whole course, which is equivalent to acting as a screenwriter and director, while the students are every protagonist or supporting actor in the classroom activities.

Discussion mode: the practical embodiment of teachers and students' rights and responsibilities. The discussion link is the final link of the sub-classroom, and is an important interactive learning activity between teachers and students. The main body of this link is the students, which requires the students to conduct in-depth special discussion and exchange on the learning results of the first two teaching links, in order to truly understand, master and deepen the content of the course in this chapter. In this link, teachers only play the role of organization and guidance. On the one hand, it is necessary to ensure that the structure of the group is reasonable and the cooperation between the members is smooth; on the other hand, it is necessary to guide the group members to discuss the contents of the course and avoid the invalid discussion that deviates from the theme. For students, classroom discussion can effectively shorten their main differences. It is easier to discover and understand complex concepts through discussion links, and to expose and challenge each other's cognition and form speculative qualities. In the discussion, each student in the group is the "knowledge communicator" identity, in the positive communication and exchange to learn from each other, reach a consensus, form a group discussion opinion [8]. Then, the second discussion and exchange of the whole class scale will be conducted on the opinions formed by the group discussions, so as to realize the mutual learning and progress between teachers and students in the sense of class.

4.4 Scientific implementation of online and offline mixed teaching program.

Based on the construction standard of gold course in ordinary colleges and universities, the online implementation standard and scheme of design specialty are constructed with the help of the online course platform added by the exchange platform and the teaching management department. On the one hand, the application of online platform should be placed within the framework of offline learning theory, on the other hand, the familiarity of students' actual computer network technology should be fully considered [9]. Online and offline mixing parallel, can effectively guarantee the continuity of the sub-class.

Classroom generation is a dynamic process produced by teacher-student interaction without prior. It is a key problem to solve how to effectively implement and achieve remarkable results on the basis of theoretical study and preset classroom. We can concentrate the advantages of the teaching team, select a theory course and a technical subject as the experimental area of the excellent class, further generate experience, and then carry on the extensive promotion.

Evaluation of Teaching Quality and Teaching Effect 5. Scientific Reflection

The sub-class teaching mode is a kind of teaching mode which respects and protects the difference of the learning subject. It has changed the traditional examination method which is based on the summative evaluation of single standard, and adopted the flexible evaluation mechanism which is based on the process evaluation [6] and the four core qualities of critical thinking, creative thinking, cooperation and communication are included in the quality evaluation. Obviously, this evaluation mechanism pays more attention to the main difference of learners' ability and determines the learning goal and curriculum input more humanized. In the implementation of the sub-class, it is necessary to further demonstrate whether the flexible evaluation mechanism is reasonable, scientific and developmental in accordance with the teaching law of higher education around the curriculum teaching assessment mechanism, teaching quality supervision mechanism, teaching effect feedback and so on. Finally, through the implementation of multiple professional courses to the sub-class, drawing "curriculum map", to repeatedly test whether the design of the presupposition and generation
of the logic of the sub-class, and help to achieve the consistency between learning effectiveness, classroom activities and academic evaluation.

5. Presupposition—the essence of generative classroom
The classroom is created in the practice of "teaching and learning" around teaching content and teachers and students in two-way communication, and it is a process existence in dynamic generation. During the course of carrying out the sub-class, we should grasp the core training goal of innovation ability and, if necessary, carry out the mixed matching of "separate class + in class ". In the course of teaching, teachers and students are the real dual subject of "teaching and learning ", which fully embodies the power and responsibility of teachers and students [4]. This will result in structural changes in the design classroom teaching process, maximizing the innovative value of its specialty.

6. Conclusions
Design is a generative classroom with essential innovation meaning to redefine the main position of teachers and students in teaching-learning. First, through the implementation of multiple professional courses, clear teachers and students equal rights and responsibilities, to promote structural changes in the classroom teaching process; second, a variety of pairs of models so that the "preset-generation" classroom can be realized; third, By developing the generative model of sub-classroom, we revise the professional talent training scheme on the basis of rethinking the gap between the direction of professional talent training and the gap between social talent gap caused by the increasing development of information technology. Construction, revision, improve the output rate of high-quality innovative design personnel. Fourth, in the development of design students' adult classroom, we can rely on design competition and teacher studio, teachers and students can jointly develop excellent works, and through the enterprise project to enter the way of R & D entities, which is helpful to the close cooperation of industry, university and research.

In a word, design has a certain demonstration significance for the construction and implementation of sub-classes from "presupposition-execution" to "presupposition-generation" in colleges and universities. This will provide a certain theoretical basis and case reference for the classroom teaching reform of design subject, and it is also a beneficial supplement to the study of design education redesign.

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