

# Design courses based on BOPPPS teaching mode

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**Abstract.** The knowledge points of design courses are complex, scattered, and cover a wide range. The traditional teaching mode is difficult to mobilize students' interest in learning and cultivate students' expressive ability. Based on constructivism and communicative interaction, BOPPPS is known for effective teaching. In order to improve the learning quality of students, BOPPPS is combined with the Rain Classroom platform to realize classroom flipping. Through the six modules of bridge-in, objective, pre-assessment, participatory learning, post-assessment, and summary in BOPPPS, the teaching progress is gradually promoted, and students' participation and feedback in the classroom are emphasized. It is a closed-loop teaching organization model. The research results show that the application of BOPPPS in design courses has effectively promoted the teaching interaction between teachers and students, and students can participate more actively and effectively in all aspects of the educational process.

**Keywords:** Design courses, BOPPPS, Effective teaching, Flipped classroom, Teaching model.

## 1 Introduction

Design courses play an important role in systematically cultivating students' design thinking, design knowledge system construction and design creative expression. The nature of the course determines that a lot of practice is required in the teaching process, and the traditional teaching mode has poor teaching effect.

BOPPPS is a teaching mode constructed based on the experiential learning mode proposed by Kolb, and it is a new teaching mode<sup>[1]</sup>. Kolb sees learning as a cyclic process: concrete experience-reflection and observation-abstract generalization-action and practice-concrete experience, that is, learning is a process of acquiring knowledge through experience, rather than direct transmission<sup>[2]</sup>. BOPPPS divides the teaching process into six modules: bridge-in, objective, pre-assessment, participatory learning, post-assessment, and summary<sup>[3]</sup>. It emphasizes students' classroom enthusiasm, participation and interaction, and focuses on teaching feedback, interaction, reflection and quality. It is a form of teaching organization with strong logic and rationality<sup>[4-5]</sup>. It follows the active and goal-oriented principles and adopts a variety of teaching interaction strategies, such as flipped

classroom and project-based teaching, to attract students to participate, and it is a model of effective teaching<sup>[6]</sup>.

The Rain Classroom has been successfully applied in many colleges and universities and different fields. G.Y. He and others have used the Rain Classroom platform to build a student-centered "blended learning" model, which has effectively improved the quality of teaching and cultivated students' autonomy in learning<sup>[7]</sup>. Q Li et al. used Rain Classroom as a smart teaching platform to reform the teaching of computer courses in military colleges<sup>[8]</sup>. Based on Rain Classroom and BOPPPS teaching, G.W. Dong et al. discussed effective teaching theory and reformed curriculum practice, and proposed that this model is helpful to improve students' learning efficiency and effectiveness<sup>[9]</sup>.

## **2 The necessity of implementing BOPPPS teaching mode in courses**

### **2.1 Insufficient traditional teaching mode**

The traditional teaching mode is mainly composed of three parts: pre-class preview, in-class teacher lectures, and after-class homework. The teacher is the center of the class and takes the initiative, while the students act as the listeners who listen carefully to the class. In this kind of indoctrination education, teachers continuously input knowledge to students, and the content of the classroom is rich in information, but the acceptance of students is very low<sup>[10]</sup>. Because students can only passively accept and lack the independent thinking process, the mastery of knowledge is limited to superficial memorization, and cannot achieve deep understanding and application. In addition, traditional teaching does not take into account the individual differences of students, and the ideological and political elements in the curriculum are not fully integrated, and students lack the subjective initiative of learning.

### **2.2 Advantages of BOPPPS teaching mode**

The BOPPPS teaching model has carried out all-round reforms in teaching methods, implementation plans, teaching content, etc., turning the traditional one-way classroom into an interactive teaching place with collision of thinking and wisdom enlightenment<sup>[11]</sup>, and students take the initiative in the classroom. In the teaching process, teachers' questions lead students to actively seek unknown answers in the known field. According to the content of the chapter, flexible switching between online and offline teaching modes can not only save time, but also make students understand more thoroughly. For example, basic concepts and basic knowledge are taught online, while design projects, case analysis, and reporting are mainly taught offline.

## **3 The specific application of BOPPPS in the teaching reform of design courses**

Design courses are an important way for design students to master design skills and cultivate innovative thinking. Teachers' use of BOPPPS combined with Rain Classroom is in line with the current design talent training goals, and the course content and course practice are reasonably arranged according to course characteristics and course goals.

### 3.1 Curriculum reform goals

Through case analysis, project teaching and scenario simulation teaching, the teaching reform of design courses adopts the task-driven method to guide students to think more and ask more questions, gradually improve students' logical thinking and design expression ability, and help students master basic design knowledge and reporting skills, and can express design ideas logically and clearly in different scenarios, such as meetings, project discussions, coursework reports, etc., to cultivate students' design expression ability. According to the actual situation of the students and the specialties of the teachers of the project team, a tutor system is adopted to lead the students to participate in the competition. The teaching content is as follows:

- ① Optimize the teaching syllabus, combining theory, seminars and practice;
- ② Establish a knowledge map to cultivate students' logical thinking;
- ③ Change the roles of teachers and students and guide students to conduct independent research;
- ④ Construct project-led studio teaching, and open classrooms stimulate students' creative thinking;
- ⑤ Scenario simulation, task-driven, exercise students' multi-channel comprehensive expression ability;
- ⑥ Attract students' interest, and the rain classroom flips the traditional teaching mode;
- ⑦ Multi-dimensional evaluation, optimize the assessment mode.

### 3.2 BOPPPS teaching mode

#### 3.2.1 B—bridge-in

Teachers publish questionnaires, course-related pre-knowledge, interesting cases and other activities in Rain Classroom to understand students' personality characteristics and knowledge background, and answer questions and guide students based on students' questions, ask incisive questions, and complete the ice-breaking session <sup>[12]</sup>.

#### 3.2.2 O—objective

Teachers clearly inform students of the role and status of this lesson in the course, clarify teaching objectives from the three aspects of knowledge, operation and literacy, grasp the key points and difficulties of learning, and give targeted explanations. Students majoring in design have a wide range of knowledge backgrounds, with obvious differences in students' skills and professional interests and preferences. According to the survey results, teachers can divide the skills objectives into different levels and multiple design directions, and encourage students to develop their own skills. Expertise and actively cooperate with other students, learn from each other's strengths and complement each other's weaknesses, build strong teams, and build students' self-confidence and sense of collaboration in the course.

#### 3.2.3 P—pre-assessment

The pre-test needs to judge the basic knowledge of students. The pre-test can take various forms, such as logo design, poster design, questionnaire, discussion, etc., and set up different types of questions such as selection, question and answer, and design tasks, and use the Rain Classroom platform to publish to students. That is, learn and practice, adjust

the relevant teaching content for the problems reflected in the pre-test, and answer them in time.

#### 3.2.4 *P—participatory learning*

This link occupies a large proportion in the six elements of BOPPPS. It advocates students as the main body and is the focus of modern teaching reform, emphasizing the interaction between teachers and students and learning content. In the interaction between teachers and students, teachers can create problem situations according to the course content, and through questioning and guidance, students can actively explore and solve problems<sup>[5]</sup>. In the interaction between students and students, teachers must first have clear teaching ideas, group students into groups, provide students with core questions, guide students to conduct group discussions, encourage students to collide with students, and students spontaneously summarize the learning content, Explore learning methods and evaluate learning outcomes.

Based on the design project practice embedded in theoretical teaching, teachers and students discuss project issues together, put forward design ideas, and strengthen students' thinking ability and innovative consciousness. At the same time, the competition mechanism is introduced, and the group is the unit. In the process of solving the problem, the members of the group collide and improve each other with different viewpoints. After their own experience, they will have a deeper understanding of the course knowledge, and finally give a solution to the problem. Finally, each group will report on the design project and comment on each other.

#### 3.2.5 *P—Post-assessment*

The post-test is mainly to test the achievement of students' learning goals and the mastery of course knowledge through tests, obtain learning feedback, and then continuously adjust learning methods and goals according to the feedback results, and gradually grind into a teaching mode that teachers and students adapt to. The post-test can use tools such as Rain Classroom and Questionnaire Star to set the question type. The author mainly uses the Rain Classroom platform to set up multiple-choice questions and open-ended questions in design theory, such as designing questionnaires and user portraits, outputting competitive product analysis reports, and designing creative visuals. Presentation, etc. According to the statistical results of Rain Classroom data, the weak links in knowledge are emphasized and supplemented in time, and the curriculum structure is adjusted.

#### 3.2.6 *S—Summary*

Summarize and organize the knowledge points learned in this class, provide teachers and students with the opportunity to reflect on the course[1], and predict the content of the next class. The way of summarizing can be summed up in a variety of ways according to the nature and content of teaching, which can be completed by teachers and students together. The mastery of knowledge is a process of combining input and output. In the process of summarizing, students can test and reflect on the degree of mastery of course knowledge and deficiencies, which is convenient for review after class and improves expression ability. Teachers can supplement and expand the course content summarized by students, and guide students to continue to explore relevant knowledge of the course.

### **3.3 Application cases-Take the course "expression and skills of design report" as an example**

The course "Expression and Skills of Design Report" uses the textbook "The Art of Design Report Expression" edited by Professor H.M.Tong, and is carried out around two major parts and nine knowledge points, the nine knowledge points include: audience, time, purpose and theme, two kinds of logic (straight to the point, advancing layer by layer), data induction, pictures and videos, arrangement, charts, and comprehensive expression<sup>[13]</sup>.

The "Design Report Expression and Skills" course has a total of 16 weeks, with 2 classes, two hours per class per week, and 45 students in each class. Among them, class A adopts traditional teaching methods, and class B adopts BOPPPS teaching.

Before class, according to the BOPPPS teaching process, complete the two links of introduction and goal, and publish classroom cases and background materials in Rain Classroom<sup>[11]</sup>, such as interesting stories, press conferences of famous brands, etc. At the same time, design tasks such as writing a diary in a graphical way are arranged to students to stimulate students' motivation for learning. Students read relevant materials, learning objectives, and complete the pre-test.

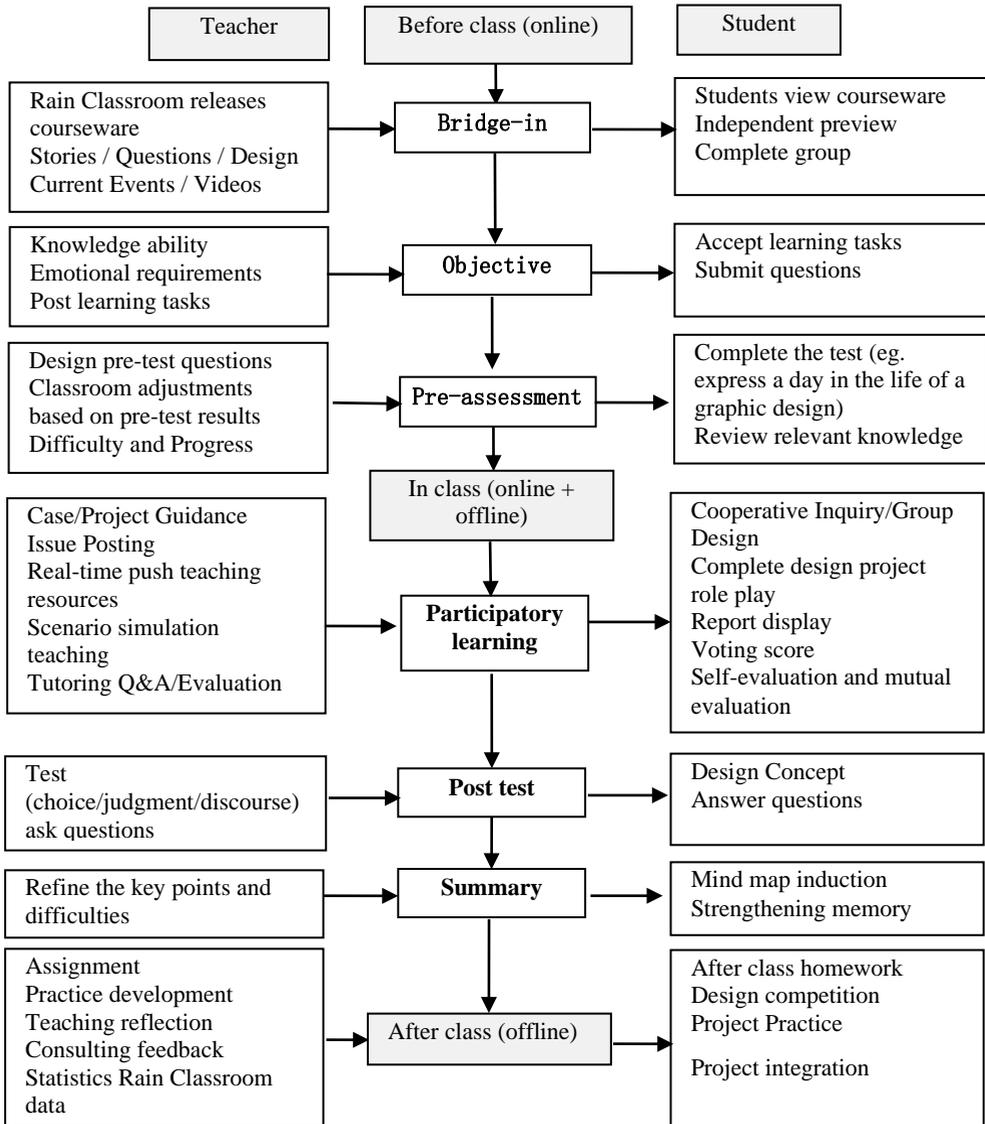
In the class, in the participatory learning link, project-based teaching is integrated. Students brainstorm on themes or related case materials provided by teachers, design works, and prepare role-playing and design reports. There are no restrictions on the form of reporting. Use the "flip classroom + rain classroom" method to make students the main body of teaching, and carry out interesting teaching, case teaching and project teaching. For example, in the course content of "how to express", teachers can incorporate "guess and guess" and "you talk and I draw" game. In the "Guess and See" game, the teacher divides the students into groups and prepares several groups of words. One student in the group is responsible for guessing the words, and the other group members are responsible for describing and cannot speak the words in the words. In the theme of "Interesting Self-Introduction", the open class was adopted, and the students left a deep impression on the audience by means of graphics, illustrations, animations, colors, talk shows, case solving, talent shows and so on. In the theme of "brand comparison", scenes such as job hunting and debate competitions were incorporated into the course, which sparked a wonderful discussion.

At the same time, the teacher explained the problems that occurred in the process of students' design and expression. The problems were mainly summarized from three aspects: design problems: color, font, typesetting, etc.; expression problems: posture, gestures, expressions, language organization, etiquette, etc. ;Thinking questions: report plot setting, logic of expression, interaction with audience and answering questions, etc. At the same time, combined with the situational simulation method, students are divided into groups, including speakers, judges and audience. After the speakers design and report, the audience will discuss and ask questions about the theme of the report. Evaluation, and finally by the teacher to comment. Then, teachers issue test questions, and put forward design practice tasks in combination with actual projects or design competitions, and post-test students. Finally, the key points in the course are refined, and the course content is summarized. The course schedule is shown in Figure 1.

### **3.4 Application feedback of BOPPPS teaching mode**

After the course, the "Questionnaire Star" platform was used to conduct a satisfaction survey on the application of BOPPPS teaching in the course "Design Report Expression and Skills". The content of the questionnaire includes course content (the breadth and depth of teaching, the logic of teaching, the key points and difficulties of teaching), teaching

methods (teaching rhythm, teaching form, teaching interaction), teaching attitude, teaching effect, using Likert five-point scale From 1 (strongly disagree) to 5 (strongly agree), a total of 36 valid questionnaires for traditional teaching (class A) and 42 for BOPPPS teaching (class B) were returned. The survey results are shown in Table 1, and the results of some students in the classroom are shown in Figure 2.



**Fig. 1.** Specific arrangement of courses based on BOPPPS teaching mode.

From Table 1, it can be concluded that compared with the traditional teaching mode, most students are satisfied or even very satisfied with the BOPPPS teaching mode. The course adopts heuristic teaching, and students' works cover a wide range of fields, covering advertising design, emotion package design, packaging design, IP image design, jewelry design, product design, UI design, etc., reflecting the individuality and differentiation of students. At the same time, 1~2 professional tutors are assigned to groups with different design directions to teach students according to their aptitude, and the "tutor system"

teaching provides all-round guidance for students. In the design report, students are guided to sublimate their emotions in actual projects, have the courage to express and realize their design ideas, and in the process of arduous search for answers to questions, establish a professional spirit of courage to challenge, and enhance the sense of responsibility and mission to serve the society.

**Table 1.** Satisfaction survey of BOPPPS teaching in the course "Expression and Skills of Design Report".

Question (Class: Class A/B)	Strongly Disagree		Disagree		Generally		Agree		Firmly Agree	
The course content has sufficient depth and breadth	0	0	0	0	16	12	17	21	3	9
The teaching points are prominent and difficult, and the logic is strong	0	0	1	0	18	12	11	20	6	10
Beautifully arranged courseware	0	0	0	0	14	5	17	19	5	18
Moderate pace of teaching	0	0	0	0	22	8	11	22	3	12
Teaching forms and methods meet the needs of the content	0	0	1	0	18	8	12	22	5	12
Teaching interaction can guide students to think about problems	0	0	0	0	18	8	13	20	5	14
Correct and natural teaching attitude	0	0	0	0	12	5	16	17	8	20
Strictly manage the classroom with a good atmosphere	0	0	0	1	17	5	14	20	5	16
The teaching effect is good, and the classroom is attractive	0	0	1	1	18	6	11	23	6	12
Strong practical application	0	0	0	1	18	6	12	22	6	13

However, this reform also has some shortcomings. Since the author applies the BOPPPS teaching model to design courses for the first time, some links may not be very proficient, and the students have completed the project design initially, and the design work needs to be further improved in the later stage.

## 4 Conclusion

Classroom learning is a key link in the teaching reform of curriculum teaching. Only when students have a clear teaching goal and fully participate in knowledge exploration, problem solving, classroom discussion, and knowledge induction can they truly take the initiative and achieve effective teaching<sup>[14]</sup>. Only by guiding students to speak freely, communicating with teachers and students in two ways, and increasing emotional exchanges can effectively improve students' learning motivation and arouse their enthusiasm. The BOPPPS teaching model can promote teachers to better conduct curriculum design and teaching reflection, realize online and offline joint teaching, and promote students' independent development. It is a useful tool to improve students' interest in learning and teachers' teaching quality. At the same time, teachers need to spend a lot of time preparing pre-class cases, courseware, test questions, group tasks, etc., in order to promote students to master and use design reporting and presentation skills. Future researchers can also integrate the BOPPPS teaching model with other teaching models in design courses, focusing on design practice and achieving effective teaching.

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