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Teaching Reform Design of UI Design Course Based on BOPPPS Teaching Model

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Abstract: *The BOPPPS teaching strategy has recently been adopted in various courses across China as an improved and practical instructional approach. However, its effectiveness has yet to be thoroughly evaluated within design disciplines that are specifically aligned with career-oriented skills. This study aims to assess the applicability of the BOPPPS strategy in higher education career-oriented design courses, using a "UI Design" course as a case study. A BOPPPS-based instructional model was developed, and an AB comparison experiment was conducted to test the model. The model's usability was verified through quantitative scales. Results indicate that, compared to traditional teaching methods, the BOPPPS approach significantly enhanced student engagement, knowledge acquisition, practical application skills, and overall learning satisfaction. This research suggests that the BOPPPS teaching model is an effective approach to improving student learning outcomes.*

Keywords: *UI Design; BOPPPS; Teaching Reforms*

1. Introduction

The demand for versatile talent has been steadily increasing in the new era [1]. Established in 1976, the BOPPPS teaching model is grounded in constructivism and communicative teaching methodologies, advocating a student-centered approach and serving as an essential instructional method for training young faculty in universities worldwide [2-3]. With the advancement of classroom teaching reforms, the BOPPPS model has gained attention from educational researchers globally as an effective tool to help educators better deconstruct teaching processes, identify instructional blind spots, and enhance teaching outcomes [4]. The application of the BOPPPS model in design courses is particularly valuable, as it not only supports students in applying knowledge within design practice but also fosters their creative thinking and expressive abilities. In a blended learning environment, the personalized guidance afforded by BOPPPS can expand students' learning time and space, facilitating deep learning [5-6].

Design courses play a critical role in systematically developing students' design thinking, building their design knowledge framework, and nurturing their innovative capacities. Specifically, the "UI Design" course reflects industry needs, as UI design is not only an academic subject but also a highly sought-after skill in the digital economy. With the proliferation of internet, mobile applications, and smart technologies, there is an escalating demand across various industries for professionals skilled in user experience (UX) and user interface (UI) design. Rapid technological advancements in the UI field often render traditional course content outdated, with limited opportunities for interaction and hands-on practice, highlighting the need to improve conventional teaching approaches [7].

2. Structure of the BOPPPS teaching model

The BOPPPS teaching strategy was first introduced by Douglas Kerrin from the University of British Columbia in 1978 [8]. As shown in Figure 1, this strategy consists of six steps: Bridge-in (B), Objective (O), Pre-assessment (P), Participatory Learning (P), Post-assessment (P), and Summary (S), collectively known as BOPPPS. Rooted in constructivist learning theory, the BOPPPS strategy provides a comprehensive framework and process for achieving instructional goals [9]. Since 2011, Chinese universities have begun implementing the BOPPPS strategy across various disciplines to enhance the teaching effectiveness of courses in learning factories, improve integrated skill development [10], and elevate the quality of classroom instruction and student performance in subjects such as English, yielding

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notable improvements over traditional methods [11].

In recent years, BOPPPS has been widely adopted in Chinese higher education, where its structured teaching process has proven effective in increasing instructional efficiency and transforming students into active learners. The BOPPPS strategy offers distinct advantages: it provides a clear classroom structure, making the instructional process more systematic and purposeful; through bridging, objective setting, and assessment phases, it effectively engages students' interest and participation; it emphasizes interaction and participatory learning, which promotes deep understanding and knowledge internalization; and the post-assessment and summary steps enable instructors to adjust teaching strategies to meet students' individual needs, thereby enhancing learning outcomes [12].

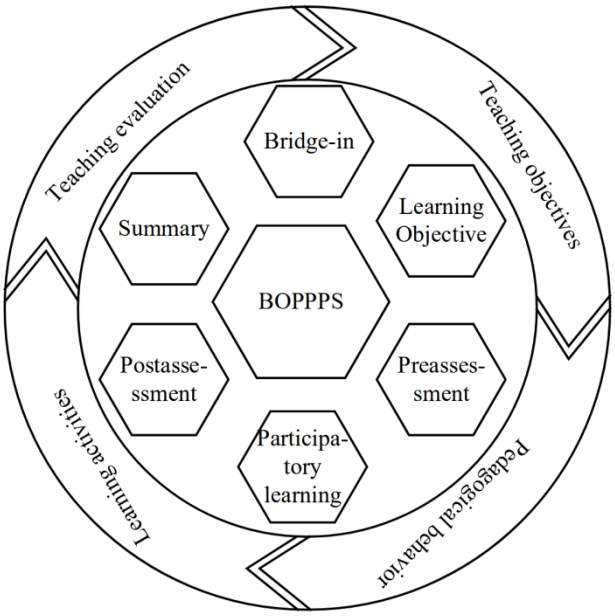

Figure 1: Structure of BOPPPS teaching model

3. Methods

The research methodology for this study is illustrated in Figure 2. First, the key points and characteristics of the UI Design course are analyzed, followed by an examination of the BOPPPS teaching model. Based on this analysis, a targeted design for implementing the BOPPPS model (including Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment, and Summary) in the UI Design course is developed. Finally, a satisfaction survey is conducted using the Wenjuanxing platform to evaluate the application of the BOPPPS model within the UI Design course, thus verifying the effectiveness of the model's implementation.

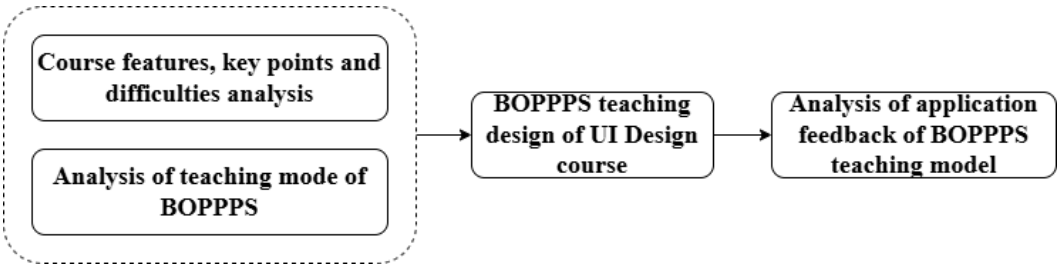

Figure 2: Research Process

4. Specific application of BOPPPS in the teaching reform of UI Design course

4.1 Characterization of the UI Design course

The UI Design course should help students acquire solid UI design skills while enhancing their

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creative thinking, data analysis, teamwork and self-drivenness for future design needs. The course content needs to be flexibly adjusted to continuously introduce the latest design trends and technologies, so that students can accumulate design experience and develop lifelong learning habits in practical applications [13]. The focus of the UI Design course can be analyzed in five dimensions, 1) User Interface Design Fundamentals: the basic theories of UI design, including visual communication, color matching, font design, typography and layout, etc., to help students establish a basic knowledge of UI design. 2) Design Principles and Norms: teaching some core principles of design, such as consistency, usability, ease of use, etc., so that students can understand how to provide users with a provide a smooth interactive experience. It also includes platform design specifications, such as design guidelines for iOS and Android.3) Interaction and User Experience: explains how to combine interaction design and user experience (UX) to help students understand user needs and develop their user-centered thinking, so that the design is not only aesthetically pleasing, but also conforms to the user's needs and habits of use.4) Use of Design Tools: learns about commonly-used design software such as Adobe XD, Figma, Sketch and other tools, so that students can efficiently design interfaces and improve their hands-on skills.5) Project Practice: Through actual case studies, from requirements analysis to prototype design to interface visual presentation, students can accumulate experience in project practice and practice project management and teamwork skills.

4.2 BOPPPS Instructional Design

Based on the characteristics and key points of the UI Design course, combined with the BOPPPS model for teaching design, the application of the BOPPPS (introduction, goal, pre-test, participation, post-test, summary) model can help build a teaching model, making the teaching process more systematic, interactive and effect-oriented. As shown in Figure 3, this is the specific application design of the BOPPPS model in the UI Design course.

The UI Design course lasts for 12 weeks, with 2 classes participating in the teaching, 4 class hours per week (180 minutes), and 25 students per class. Class A adopts traditional teaching methods, and Class B adopts BOPPPS teaching.

In the pre-class stage, the teacher releases the preview content through Rain Classroom, and can arrange tasks through WeChat groups. In the offline course, learning goals are established to stimulate students' interest in learning and introduce the theme of the UI Design course. On the student side, by completing relevant tasks such as preview, students can understand the specific learning content and requirements, and through some discussion interactions, help students understand UI from a multi-dimensional perspective.

During the course, teachers can adopt innovative classroom teaching modes such as PBL, case studies, heuristics, seminars, and comparisons. Through various activities, students can participate in learning UI design knowledge and conduct participatory learning. The functions of Rain Classroom such as bullet screen and online knowledge evaluation can help students conduct participatory learning, establish a good learning state, and let students complete UI-related design theme practice content, conduct mutual evaluation among students, and establish critical thinking and subjective initiative. Students are divided into groups to modify this process and put forward improvement suggestions for possible design problems in the case. Post-evaluation (post-test) evaluates students' mastery of the course content. Students can understand their practical application ability of UI design through group summary and work display. Let students display their designed UI works in groups and conduct self-evaluation and mutual evaluation. Teachers can comment on the works based on standard scoring (such as aesthetics, operability, user experience, etc.).

The teacher summarizes the core content of this lesson, such as design principles, UI processes, tool usage, etc., and asks students to share their gains or difficulties in learning. The teacher can complete the on-site Q&A interaction through offline classes or Rain Classroom. The student side needs to complete the post-class content, such as completing a design sketch of a small APP interface as a preview of subsequent courses. Teams can exchange learning content with each other, and at the same time, they can re-transform the results and participate in relevant UI design competitions.

Through the BOPPPS model, the teaching process of the UI Design course can be arranged more systematically, from stimulating interest to clarifying student participation, to feedback and summary of results, which can effectively improve students' participation goals and their mastery level in actual teaching. Among them, teachers can also flexibly adjust teaching activities according to classroom feedback to meet the needs of students of different levels.

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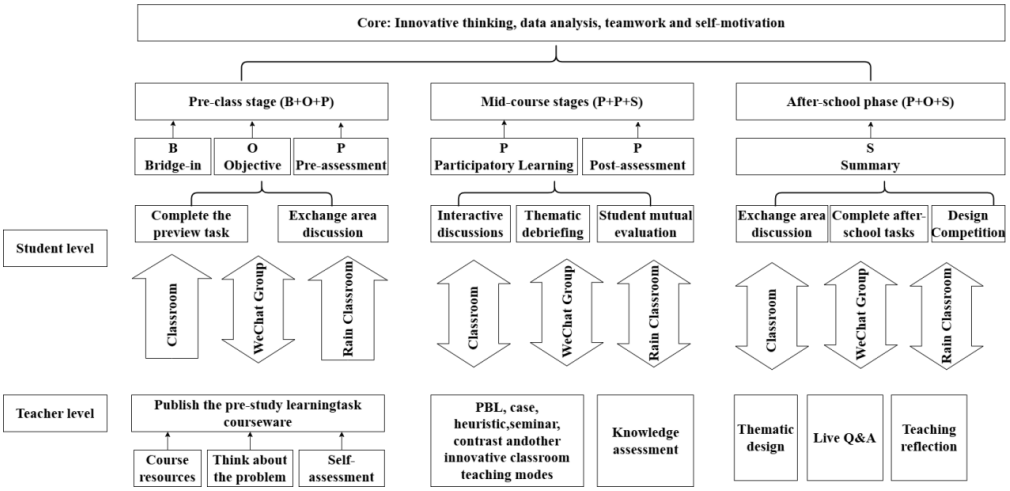

Figure 3: Teaching design based on BOPPPS model

4.3 Feedback on the application of BOPPPS teaching model

Upon course completion, a satisfaction survey was conducted via the Wenjuanxing platform to assess the effectiveness of the BOPPPS teaching method in the Design Presentation and Techniques course. The questionnaire was designed to cover multiple dimensions, including course content (such as breadth and depth of teaching, logical flow, key points, and challenges), teaching methods (pace, format, and interaction), teaching attitude, and overall teaching effectiveness. Responses were measured on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A total of 41 valid questionnaires were collected, with 21 from the traditional teaching group (Class A) and 20 from the BOPPPS teaching group (Class B). The detailed survey results are presented in Table 1.

Table 1: A Satisfaction Survey on the Practice of BOPPPS Teaching Model in UI Design Course

Question (Classes: A/B)	Violently disagree		Disagree		General		Agree		Strongly agree	
Positive and natural teaching attitude	0	0	0	0	0	0	18	11	3	9
Strong application of theory to practice	0	0	0	0	2	0	17	9	2	12
Good teaching effect, attractive classroom	0	0	0	0	1	0	16	5	4	15
Rigorous classroom management and good atmosphere	0	0	0	0	0	0	16	4	5	16
The teaching points are outstanding and logical	0	0	0	0	0	0	15	5	6	15
The courseware is beautifully organized	0	0	0	0	0	0	12	2	8	19
Sufficient depth and breadth of course content	0	0	0	0	1	0	14	3	6	17
The pace of the teaching process is appropriate	0	0	0	0	0	0	17	5	3	15
Teaching forms and methods meet the needs of the content	0	0	0	0	1	0	14	3	5	17
Teaching interactions have guided students' thinking	0	0	0	0	1	0	16	4	3	16

Analysis of Table 1 reveals that, compared to the traditional teaching model, the majority of students expressed satisfaction or even high satisfaction with the BOPPPS teaching model. The course employed problem-based learning (PBL) as a practical teaching approach, encouraging students to identify issues and create UI projects that span various dimensions of daily life, resulting in multifaceted transformations of their outputs. For groups focusing on different design directions, each was assigned one to two professional mentors for personalized guidance, along with peer evaluations among students. During the final design presentations of the UI projects, the course guided students to delve deeply into creative thinking within real-world projects, fostering their problem-solving skills in design expression, cultivating a professional attitude of embracing challenges, and enhancing their sense of social responsibility.

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5. Conclusion

The BOPPPS model emphasizes a student-centered teaching philosophy, focusing on interaction and participatory learning between teachers and students. The teaching practices in this study indicate that educators must invest more time and effort in lesson preparation to gain a deep understanding of course objectives, content, and the innovative and challenging teaching materials involved. Additionally, teachers need to thoroughly understand students' knowledge backgrounds and individual characteristics, leveraging technological advantages to enhance the interactivity of the teaching process.Students, on the other hand, should shift their traditional learning perspectives and methods from passive reception of lectures to autonomous learning and self-exploration, thereby enhancing their independent learning capabilities and innovative thinking skills. Ultimately, students are the primary stakeholders in education, and their learning outcomes and receptiveness reflect the effectiveness of the teaching model's design.

The BOPPPS model provides targeted strategies for teaching based on the diverse needs of different student groups, ultimately achieving optimized teaching outcomes. By applying the BOPPPS model and establishing a comprehensive teaching system that emphasizes active participation from both teachers and students, it is possible to enhance teachers' pedagogical skills while fostering students' independence, self-directed learning abilities, collaboration, and innovation. This, in turn, improves students' overall learning capabilities and realizes ideal teaching outcomes. This study explores a new teaching model using the "UI Design" course as an example, offering valuable insights; however, further research is needed in the context of future blended learning models.

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