

A Situational Design Method for Experiential Practical Teaching

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Abstract—Situational design is the key to the whole experiential practice teaching. For one thing, the article starts with the experience context and user analysis. Through observing the user's itinerary, the method of situation design for teachers is introduced in detail. For another, relying on teachers' situational design and instructional guidance, this paper introduces the process of experiential practice in which students construct project task model. The research on the situational design method of experiential practical teaching provides a new way of thinking for experiential practical teaching research and a new idea for the cultivation of innovative talents.

Keywords—*Experience-based; Practical Teaching Model; Situational Design*

I. INTRODUCTION

The Outline of the National Medium and Long Term Education Reform and Development Plan (2010-2020) calls for "people-oriented, exploring various ways of training talents, advocating heuristic, exploratory, discussion and participatory teaching". Shang Weiyan and others guided students to participate in the classroom reform of the whole teaching process, and improved students' initiative and enthusiasm [1]. Jiang Haobin and others systematically designed the experimental teaching ideology, system, mode, content, method and means according to the idea of "being able to fill the reality with the theory" so as to enable students to experience various kinds of experiments in the virtual environment of autonomous interaction [2]. Zheng Shuangling and others have explored a teaching mode that combines experimental teaching and scientific research organically to cultivate students' experimental exploration ability, innovative consciousness and team spirit [3].

Simulated experiential teaching [4] is student-centered, which is conducive to stimulating students' enthusiasm and creativity in learning. It has been strongly advocated in the domestic educational circles in recent years. Gu Dinghong pays attention to changing thinking idea, reconstructing knowledge system and changing teaching process, and creates 5G experiential classroom with sensibility, touching, feeling, gratitude and inspiration [5]. Xia Yue takes guiding students' initiative as the breakthrough point, and lets students creatively design, practice and experience the situation in the teaching content [6]. Zhang Chen put forward four teaching modes: case teaching mode, scenario case simulation mode, interactive mode and entity project mode, and formed a cycle of

experience-reflection-formation-action-experience mode [7]. Cai Changmao integrates teaching knowledge points into practical links, and sets up four dimensions of teaching situation: observation experience, two-dimensional experience, three-dimensional experience and design experience [8]. Niu Chicheng takes reducing theorized components and improving the efficiency of practical activities as the direction of teaching. He studies the experiential teaching method of three steps: using cases, deepening practice and constructing scenes [9]. Sun Yibin and others reconstructed the course content through many links, such as post recognition, team formation, enterprise simulation management, and so on. They adopted three teaching methods: experiential teaching method, role-playing method and student assistant teaching method to integrate "learning" and "teaching" in an experiential environment [10]. Feng Chenyu discussed the application of experiential teaching in innovation and entrepreneurship education in Colleges and universities [11].

For one thing, this paper takes the teaching process of teacher-led demonstration, guidance, inspiration and induction as a clue. For another, a new mode of experiential practical teaching is put forward, which is based on the process of experiential learning with students as the main body, and the method of situational design is introduced in detail.

II. OBJECTIVE

The core idea of user experience design is user-centered, considering user experience from the perspective of user context. User research is a systematic study of the goals, needs and abilities of users. The key users of practical teaching are students of all grades and professional teachers. Considering the experience needs of such user groups, situational design should not only facilitate teachers to set up experimental projects to meet the curriculum needs of students to master teaching knowledge points, but also verify the problems raised by students and meet the individualized needs of students to explore interesting issues. In addition, the design of situational experiential practice teaching mode should embody the characteristics of interesting, usable, simple and challenging. The basic methods of user experience research include user context, evolutionary design and task model.

III. METHODS

A. User Analysis for Experience Context

User context refers to the thinking and cognitive environment of the user's brain and the operating environment

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of the user interface in the process of operation. Studying user context is helpful to observe students' real thoughts, acquire students' knowledge difficulties in real time and understand the problems existing in students' experiment process on the spot, and obtain more objective data of students' intentions, so as to meet individual needs.

1) Experience Context and Mining Users

The main process of user context is to observe the user, not to ask the user. The main process is in the traditional experiment set by the teacher without the students' knowledge. Observing the communication between students, discussing the language, the core questions that students ask to teachers, and the behavior and actions of students' experimental operation can be regarded as a scene. In the course of observation, the teacher records in detail in order to prepare for the subsequent extraction of teaching needs and the reappearance of scene situation in the process of situation design, especially focusing on some details that are easy to ignore. In this process, students are regarded as the target of experimental teaching research, and users are deeply excavated and understood. In the process of experiment, students' behavior and words often contain a lot of demand information. It is an important process to find the relevant demand information to the greatest extent so that teachers can find the improvement with their professional knowledge and technology.

2) Transfer Roles and Simulate Users

The main role of user roles is that professional teachers understand students' needs for experimental projects, meet teaching needs, and avoid inconsistencies and contradictions between teaching needs and students' personalized needs. Transferring roles is a student-centered research method, which subverts the past teachers' determination of experimental items and contents. The specific process includes: Firstly, on the basis of the observation of language and behavior, this paper analyses and studies the details of students' thinking mode and behavior. Secondly, by transferring their roles, professional teachers complete the experimental items stipulated in the experimental syllabus as students, express their own behaviors and feelings in language, and use psychological mechanism to express and organize domain knowledge and clues to solve problems in a colloquial way. In the process of the experiment, the teacher always puts himself in the role and considers and analyses every detail of the experiment from the student's point of view. In this process, it is necessary to record all the thoughts, actions and feelings of the teacher when he completes the task, so that the teacher can find the improvement of the experiment project from the student's point of view.

3) Crowd Focus and Understanding Users

Crowd focus can get more novel and creative information in a short time. It is usually accomplished through interviews combined with brainstorming and discussion, which is very useful for experiential situational design. In order to make the interview results truthful and comprehensive, better understand the users, avoid the interaction in the crowd focus, especially the unreliable, silent, following the trend and other issues, which may result in not individual sincere opinions, researchers can use multi-level individual interviews and focus group interviews, multi-party access to information before interviews and set up fixed problem to filter users.

Firstly, individual interviews with students are conducted to gradually focus on the observation of the above-mentioned behaviors, and to inquire about the students' behavior and language, so as to understand the students' thoughts and interpret the connotation of language behavior in the experimental process. At this stage, it can be suggested as follows: "If you were to design your own experiment, what would you like to verify?" Hope to experience those operations?...", in order to get the real students' ideas. Secondly, professors from the same disciplines at home and abroad conducted individual interviews and invited professors from the United States, the United Kingdom and Japan to conduct interviews together. The specific task is to understand foreign teaching and solve the problems found by students and teachers in the simulation experience. Finally, focus group interviews are conducted, in which many people are interviewed together. Focus groups are mainly composed of teachers, graduates of similar majors in domestic universities and relevant personnel of large and medium-sized enterprises. They organize and conduct multiple rounds of interviews. Through multiple rounds of focus group interviews with different groups of people, students, teachers and society have a profound understanding of the needs of experiential practical teaching.

Through mining users, simulating users and understanding users, this paper makes user analysis, refines the experience elements and basic teaching contents of experiential practice mode from the perspective of teaching and students, and discusses and determines the situational design ideas of experiential practice teaching.

B. Situational Design Method Based on User Travel Observation

Situational design method adopts an evolutionary idea, which is the design method of task planning and intention of behavior and improvement of experience in the process of operation. In the user experience interaction system, the process that users achieve their goals is called journey. According to the research results of user analysis in the previous chapters, teachers need to select a number of teaching knowledge points to create the plot and imaginary details of the experimental project in the form of virtual interactive system, which is the original Situational Design model. Teachers publish in the form of tasks, and students complete an experimental task and achieve a goal. Students are required to think from the experiential mode of practice, use psychological mechanism to express domain knowledge and clues to solve problems in a colloquial way, organize them in every step of the experiment, and at the same time use the psychological mechanism to express, organize them in a colloquial way and express their thoughts, actions and feelings through languages. In order to avoid the deviation of students from the teacher's task goal when they complete the experiment task, the teacher should observe and record the whole process of student users accomplishing the task and achieving the goal. After the completion of student user tasks, teachers need to complete the situation design improvement of experiential experimental teaching through the following stages.

1) *Imagine The Journey*

Let the students imagine and describe the process of accomplishing the task. Admittedly, there are starting points and various potential paths to accomplish a task and the process of accomplishing a task can also be stuck because of lost direction and wrong direction. Because it is the original scenario model, students can abandon or change the interactive itinerary at any point. The original scenario design model evolves in the process of abandoning and changing gradually. Imagine that students need to explain the user itinerary to complete tasks smoothly.

2) *Stroke Visualization*

This process combines mind mapping. Teachers turn students users' ideas about the itinerary into a series of draft frameworks. They seriously consider what changes can improve the experience and find repetitive tasks that can be removed.

3) *Create Itinerary*

Teachers will observe the interaction process between users and one or more users, and use a series of sketch frameworks to formulate multiple itineraries. At the same time, they will pay attention to the original plot and the knowledge points covered by the experimental project, modify the virtual interactive system of the experimental project in real time, and combine the virtual and the real in order to make the user's itinerary as smooth as possible in the context design.

The above process will find many constructive changes in the original Situational Design model. There are many differences between the user's imagination and observation in the initial concept, which can find the breakpoints that may potentially miss the user due to poor interaction design. Using these methods, we can find the realistic path, real-time analysis and find the defects of the original design, and then reduce the risk of unhealthy and failure.

IV. RESULTS

Teachers ultimately provide guidance documents for students' experiential practical teaching, including virtual interactive system for assigning practical tasks and objectives and experimental projects to students. According to the task and goal, the students put forward the experiential experiment task model combined with virtual interactive system and carried out the experiment.

Task model is to analyze the tasks that users need to accomplish in order to achieve their goals. After careful consideration of teachers' tasks and objectives, students put forward experimental projects in groups to verify the tasks and objectives. The main process of experiential practice includes:

Each group of students first draws up a practical project according to the guidance document of experiential practical teaching.

Each of the team members proposed a quick solution of 1 or 2, and proposed a schedule to complete the experimental project in the form of a block diagram. Every member of the team is required to approve it, to give it in the form of

experimental experience, and to list the practice schedule as the first scheme of practice.

Student users use virtual interactive system to simulate the situation for virtual verification. Team members discuss the feasibility of each experimental process. Then adjust the schedule of the experimental project proposed in step 2. Fill in the form as the second scheme of practice. Repeat the process. In the table, give a number of practical schemes and optimize the schemes to build the experience. Then type the task model. According to the task model, student users can practice experientially, and complete the actual operation of the experiment project - experiencing the actual situation and experiencing the experiment. Subsequently, under the guidance of teachers, the group members analyze and discuss the problems in actual combat situations, reflect and understand the knowledge points in practical teaching, then show and propose better experience and practice programs.

V. CONCLUSION

The experiential practice teaching mode is a kind of practice teaching mode with teachers as the leading and students as the main body. Combining teaching cognitive activities with students' emotional activities organically, the teaching mode of experiential practical teaching is studied from the perspectives of teachers and students respectively. The design of teaching situation is the key to the effect of experiential practical teaching. User analysis method aiming at user context is used to design practical teaching situation according to user itinerary observation, and the task model of student practice is completed. Experiential practical teaching mode aims at cultivating students' various abilities. It can fully mobilize students' enthusiasm and initiative. It has the characteristics of interesting, usability, simplicity and challenge. It is extremely important to improve the teaching effect.

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