# Exploration of Online and Offline Blended Teaching Reform Based on SPOC+Mu Classroom--Taking Product Innovation Design and Development Course as an Example

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**Abstract:** *Blended teaching is based on Internet technology and online open courses, which combine online learning as well as offline lectures. SPOC is a small-scale restricted online course that is widely promoted and used in schools, and Mu Classroom is a blended teaching tool that seamlessly connects to the school cloud. The combination of the two can bring into play the "student-centred" teaching concept and cultivate students' ability of independent learning and active thinking.This paper takes the exploration and practice of blended teaching in the Product Innovation Design and Development course as an example, making the teaching effect digital by citing the online resources of China University's MOOC platform as well as offline with the use of MU classroom teaching tools. This not only improves the efficiency of the classroom, but also enhances the teaching effect. It also explores new teaching mode ideas for the product design course.*

*Keywords: SPOC; Mu Classroom; Online and offline; Teaching reform*

In April 2018, the Ministry of Education issued *the Education Informatization 2.0 Action Plan (Education Technology [2018] No. 6),* proposing to adhere to the core concept of in-depth integration of information technology and education teaching, and strive to build a new model of "Internet + education" talent training[1]. It is a new form of online education and teaching, which is a unit of knowledge of a single course for university students, with the same characteristics of openness and sharing[2]. The Mu Classroom is a hybrid online and offline teaching tool developed by China University MOOC on the basis of the MOC platform, which can be seamlessly integrated with the school's cloud platform to connect online and offline teaching data and build a holistic solution for classroom teaching.SPOC+ Mu Classroom organically combines offline classroom learning with online learning, while breaking the limitations of space and time, so as to obtain the best learning effect. Innovative Product Design and Development is a highly practical course that aims to develop innovative design thinking in students. It provides a flexible and integrated use of design methods and tools for product design practice, and plays a very important role in the students' future work in product design. Based on the importance of the course, it is important to pay attention to the construction of the course [3], improve the teaching effect, and promote the improvement of the quality of training of product design talents.

## 1. Overview of the blended teaching mode based on SPOC+Mu Classroom

SPOC+Mu Classroom is a combined way of blended teaching in colleges and universities, combining Internet teaching and traditional teaching methods with each other[4]. This mode integrates high-quality teaching resources to achieve a new teaching mode with complementary advantages. It not only plays the leading role of teachers to guide, inspire and monitor the teaching process, but also fully reflects the initiative, enthusiasm and creativity of students as the main body of the learning process, so that the differences in learning outcomes between students at different levels become smaller and the learning objectives are achieved.

Although SPOC can achieve blended online and offline teaching, the data of offline teaching activities cannot be connected to online, such as attendance , random roll call, classroom exercises and accompanying discussions. It is still recorded in the traditional way, making classroom management time-consuming and costly. MU Classroom allows teachers to design and manage the teaching and

learning process in 3 segments: before, during and after class. It is not only a mobile teaching tool to improve the efficiency of classroom teaching, but can also be used independently to create stand-alone offline classes that are not linked to online courses.

The combination of SPOC+Mu Classroom enables a seamless connection between SPOC online and offline teaching activity data. Using the MU Classroom APP, teachers can design classroom teaching as a whole and view offline teaching activities such as, attendance, roll calls, assignments and discussions. This data is directly linked to the SPOC and forms part of the course grade, along with the number of videos watched, the number of times, the length of time, and the number of responses to discussions on the SPOC online. This type of assessment provides a more objective and comprehensive picture of the teacher's teaching and student learning in general. Take 'Product Innovation Design and Development' as an example to introduce the practical application of SPOC+MU classroom.

## 2. Pre-study preparation for SPOC+Mu Classroom

The course Product Innovation Design and Development is based on the national quality online courses on the MOOC platform of China University. By citing the quality online course resources that have been built, it is conducive to students' exposure to the teaching resources of famous teachers from other universities, which can better improve students' professional knowledge ability. The SPOC online content module basically includes course announcements, grading criteria, courseware and videos, tests and assignments, exams, discussion forums, etc. Teachers can also select chapters or add chapters based on their own course content. Instructors can also add new modules or delete resources according to their own course characteristics and requirements. Teachers will need to organize the entire course and reorganize the order in which the chapters are published. At the same time, teachers need to arrange the content of each chapter and the content of the in-class and post-class tests, as well as the way they are marked. Next, the teacher enters the classroom backend of the China University MOOC platform and creates a Mu Classroom associated with the online teaching resources. Enter the class name, semester and class time during the week, and click Save to complete the creation of the offline classroom. Once the classroom is created, a QR code will be automatically generated and students can scan it to join the classroom. Once the classroom is created, teachers can prepare their lessons online according to their teaching time, and a lesson preparation record can be created for one lesson preparation date. Lesson preparation content is based on the overall design of the teacher's online and offline classroom, adding corresponding teaching activities, such as homework, questionnaires, announcements (pre-study , teaching objectives, post-lesson assignments, etc.), discussion forum topics, etc. Teachers can upload PPT and videos through the backend to help students preview the course and learn online. Students receive pre-study related content posted by the teacher in MU Classroom and can watch videos, documents, PPT, etc. to complete their pre-study tasks. As these operations in MU Classroom cannot be performed through the mobile phone, they must be set up in advance on the computer side. This allows students to use their mobile phones to carry out activities and post relevant in-class tests or discussion questions when the offline class is running.

The course Product Innovation Design and Development focuses on the entire process and difficulties of product design through design thinking, the concept of innovative product design, the process of innovative design, and innovative design methods, allowing students to complete a thematic design topic from design concepts, design research to innovative product design and development, close to real life. The course content is designed to further enhance students' aesthetic and creative abilities to strengthen their comprehensive design thinking skills and improve their ability to develop, express and confirm their ideas with the design theme as the centrepiece of their overall consideration of the whole product element. The focus of study is on the design research process, analytical methods, design creativity, design problem solving and systematic design thinking. Familiarity with the use of design methods, the development of creative thinking, the search for design breakthroughs and the exchange and discussion of design ideas are the core elements of this course. It is necessary to insist on combining theory and practice, to train useful people with practical skills for society, and to foster innovation and entrepreneurship. According to the central content of the course, teachers can find quality course resources that are more similar to the teaching content of this course through various platforms, such as the national high-quality course Design Thinking and Innovation Design of China University SPOC. This course has design thinking, innovative design and innovation and entrepreneurship in it, and is also a national boutique course. The content that needs to be added is innovative design methods, so the corresponding chapters are added on top of the referenced course resources so that students can learn online repeatedly. By watching the videos online and the PPT content, students gain an understanding of design thinking concepts, innovation design concepts and

innovation and entrepreneurship cases, and can use the knowledge they learn online to guide their offline practice or exercises in innovation design.

Once the teacher has all the chapters scheduled before the course is offered, they can start editing the announcements. Announcements are used to post course information and notices, such as class start notices, assignment reminders, exam notices, etc., to act as a reminder to learners. When posting announcements to classes taught, course passwords can be set in order to enable data clarity and to avoid some students not taking the corresponding test exercises[5-6].

## 3. Implementation of SPOC+Mu Classroom teaching

The course Product Innovation Design and Development has 32 credit hours. It is recommended to set 20% of the credit hours as online student self-study hours, and the offline classroom mainly consists of 2 parts: theory teaching and practical teaching. One week before the course starts, the teacher needs to publish the course opening announcement through the China University MOOC platform to remind students to take the course and be prepared for pre-study. The first time of the general course is arranged offline, mainly to be able to tell students the overall arrangement, reform, teaching content, learning methods and assessment methods of the course, so that students can be prepared for the course learning, as well as to play the main role of students in the classroom.

The course grade of Product Innovation Design and Development consists of 2 parts: online and offline. The online grade is 40% of the final grade, with 10% of the number and length of videos watched, 20% of the in-class and post-class tests and exercises, and 10% of the active discussion. Each project will receive full marks for initiating three discussion posts or replies to questions related to the content. The offline final exam is worth 60% of the total grade. As this course also includes in-class practical hours, which test students' creative design skills, it is more appropriate that the final examinations for the final coursework account for 60% or more.

(1) In the classroom. In the offline class, the teacher clicks "Start Class" on the app side of the Chinese University MOOC platform, and then the class starts. After the students have manually refreshed, they can see the "in class" message. The teacher turns on check-in and GPS for attendance, and students sign in for class on the app. The teacher checks the pre-study and summarises the existing theoretical knowledge. Offline, more flipped classroom teaching is used. For the practical part of the teaching, teacher can group the students according to the project and use heuristic teaching to guide them in conjunction with the online teaching videos. The group members discuss and complete the sketching, discussion, optimization and presentation of the design as required. The main role of teacher in the offline classroom is to guide and inspire students to complete the product design and to guide them to continuously modify and improve the design. This teaching process fully reflects the 'student-centred' teaching philosophy in the teaching process. Students are the protagonists in the classroom, and the teacher is the director, organizing and guiding students to complete their own design ideas, allowing students to have more opportunities to discuss and learn with others, so as to allow students to "learn by doing" and teachers to "teach by doing".

(2) Issue discussion questions and random roll calls. In the process of teaching, teachers can post discussion topics in the MU Classroom according to the teaching design of the online lesson preparation. Students can post their understanding and mastery of the knowledge and practice in the discussion forum, and then teacher can answer questions and solve problems. Both teacher and students can give credit to students who give good answers in the discussion forum. The teacher's nod indicates that the student's point of view is an excellent one and that other students can learn from each other. By asking random questions in class, teachers can see how well students are actually learning and evaluate their answers. Discussion questions and random roll calls also enhance the atmosphere of the classroom, increase activity and diversify the forms of teacher-student interaction.

(3) In-class and post-class tests. In-class tests are conducted in real time to provide a comprehensive understanding of students' mastery of the various knowledge points they are currently studying. Post-class tests reinforce students' learning of classroom points. Tests and assignments are designed according to the focus of each task and the content of the online videos. Teachers allow students to practice and test after or during class according to their classroom teaching schedule. On the one hand, this urges students to watch the videos carefully, and on the other hand the teacher can adjust the teaching process in time based on immediate online feedback from students. The discussion area is the most active area of the MU Classroom. The teacher issues discussion topics, and students can collect information or produce their own works, express their views, ideas and show their works in the

discussion area, etc. The teacher's timely comments and feedback can promote teacher-student interaction and student-student interaction.

(4) Grading criteria for tests and assignments. The marking criteria is the basis for evaluating the learning effect and result, which not only stipulates the form of assessment, assessment requirements and the composition of the learning grade of the course, but also covers the description of the learning form for the learners, so that the learners know clearly the learning mode of the course at the beginning. the PPT and video part is the core of the SPOC construction, and is also an important part to reflect the difference between the courses. the PPT is the outline of the teaching process The content should be concise and clearly organized. It is good to go with corresponding diagrams, flow charts, photos and drawings etc. The graphics are designed to be relevant to the teaching content and should be simple and beautiful. Videos are important learning materials that are visually presented to the learner and students can accompany SPOC videos. After the teacher has re-integrated and decomposed the knowledge structure and skills operation points for each unit or task of the course content, the knowledge points and operation key points can be collated or filmed as new knowledge points for learners to watch and learn again and again.

(5) Wrap-up and post pre-test announcements and class dismissal. At the end of the offline lesson, the teacher summarizes the class and posts a pre-reading announcement for the next lesson, or a unit test announcement in MU Classroom. When the teacher clicks on the class dismissal button, it means that the lesson is over, but students can still see the announcements on the class page and complete the corresponding activities in the row.

After each completed lesson, the teacher can see the lesson record of each lesson on the SPOC PC, for example, students' attendance, number of roll calls, questionnaires, number of discussions, class exercises, test results, number of videos watched, etc. Its a detailed record of the real teaching and learning activities that took place in the classroom, as well as relevant teaching and learning interaction data. It can be synthesized at the end of the semester and used as part of the course assessment results.

## 4. Conclusion

The blended teaching of SPOC + MU Classroom makes full use of the advantages of information technology and integrates the teaching resources of various universities in China, so that teachers can teach and students can learn without barriers. Product Innovation Design and Development is carried out using online and offline hybrid teaching, which not only computerizes the teaching process and allows the teaching reform to be advanced in a deeper way, but also collects students' learning achievements and works centrally and becomes a learning resource for students at the next level. In the course of teaching practice, some technical problems are occasionally encountered, and the teaching mode for the course is still being explored. The teaching model will continue to be improved in future teaching practice in the hope that it will provide a reference for teaching reform for teachers of related courses.

## Acknowledgements

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