

# Study and Practice on the Teaching Reform of ASP.NET Programming Course

Xiaoling Yao  
 College of Information Science and Engineering  
 Linyi University  
 Linyi, Shandong Province, China  
 true1234@163.com

**Abstract**—At present, there are some problems in the teaching of ASP.NET, such as neglecting the main body of teaching and students’ being afraid of learning. So it is necessary to redesign teaching, transform the original teaching model to “student-oriented”, readjust teaching content, adopt the teaching model integrating MOOC and case study, improve evaluation models centered with ability assessment, and focus on training students’ positiveness and practical ability of programming, which can help make students more enthusiastic about learning and increase their pass rates.

**Keywords**—ASP.NET; teaching mode; MOOC; Evaluation model

## I. INTRODUCTION

ASP.NET programming is an elective course in the computer science and technology and software engineering of the School of Information Science and Engineering. Students are required to use Visual Studio to learn and practice network programming design on the basis of Microsoft’s NET framework. Therefore, students’ practical abilities to compile network programming are emphasized in this course. However, along with the development of computer technology and increasing of textbook content, students are likely to have the following problems:

Lack of initiative. In the class, students practice programming just by mechanically repeating teachers’ code. They lack the ability to program and debug, so their understanding with knowledge merely stays on the surface. Even they are not willing to master or apply knowledge skills.

Due to the development of ASP.NET and increasing of textbook content, students have fewer hours to learn theories and practice what they have learned. In addition, students have various abilities to acquire new knowledge, so the learning pace between teachers and students is inconsistent. As a result, the learning effect will be influenced.

The writer explored the teaching mode corresponding with talent training in this college based on existing problems in course teaching, discussed the teaching content and model of ASP.NET, and formed the new teaching model with the practice as its premise, students as the center, knowledge as the main line, and training students’ programming abilities as the emphasis. The following is elaborated from the aspects of

This paper is one of the phased objectives of ASP.NET Programming Design, the 2017 Classroom Teaching Mode Reform Project in Linyi University.

teaching design, teaching methods, teaching means, assessment methods and teaching resources.

## II. SORT OUT COURSE STRUCTURE AND PLAN COURSE CONTENT

The course content of ASP.NET was previously based on the development of dynamic web pages. However, the development of mobile Internet has made the interaction between mobile app and websites become a common hotpot in current development. In addition, ASP.NET technology has been upgraded by Microsoft based on its development, so it is necessary for us to sort out course content again.

Taking the development of ASP.NET, the real demand of IT industry to ASP.NET, and students’ real conditions into consideration, the course group sort out the course structure again, redesigned the course content and made it corresponding with the current development of ASP.NET. On the basis of former dynamic Web pages, MVC framework and the interaction of Mobile app network have been added to the course content. Course knowledge modules were planned again to adapt to the demand development of IT industry. The new course content module is as the table1.

TABLE I. COURSE CONTENT MODULE OF ASP.NET

Serial number	Teaching model	Hours
1	Introduction to cases and course	2
2	Principles of Web development	2
3	Introduction, developer tools of html, javascript and jquery	3
4	Web controls	3
5	Built-in objects of Net	3
6	ADO.NET and three-tier architecture	4
6	Entity Framework database access	4
7	Data binding with data controls	5
8	Web service and mobile connection	2
9	First exploration of MVC model	4

## III. REFORM OF TEACHING MODE

At present, the teaching mode of ASP.NET programming design course is integrating computer labs, theories and practice, which can make it possible for students to directly practice what they have learned and have a deep understanding with knowledge points. However, the teaching mode is still oriented with teachers, failing to inspire students’ initiative. In addition, the entire course can’t be grasped in the model so that

the targeted teaching objectives cannot be realized. Therefore, we should further explore and improve teaching mode, transform the teacher-oriented teaching method into student-oriented mode. Then students' learning interest will be greatly strengthened.

In Bloom's Taxonomy, teaching objectives are divided into knowing, understanding, applying, analyzing, synthesizing and evaluating[1]. It pointed out that learning content has the difference of being simple and complex. So, teaching should be based on learning objectives. Various teaching models should be adopted for various objectives, which can inspire students' learning interest and help them master content. According to the target classification, teachers should regard students as the center, divide teaching objectives with arranged teaching modules, and adopt various teaching methods.

A. Explore MOOC teaching by means of various modern teaching tools

Since 2012, MOOC has been more popular in China and it has experienced fast development, covering higher education, basic education and vocational education. It is pushing the reform and development of education as a new teaching mode. MOOC can realize flipped classroom, change traditional teaching mode and procedures, and reverse class procedures [2]. Students are required to autonomously preview knowledge points before the class, and their doubts and practice will be emphasized in the class. Such mode can effectively promote their learning initiative, inspire their learning interest, and improve teaching effects. Therefore, modern education tools like "rain classroom" and on-line teaching websites should be adopted to explore the mixed teaching mode of "MOOC plus classroom teaching". The teaching procedures are shown in Fig.1.

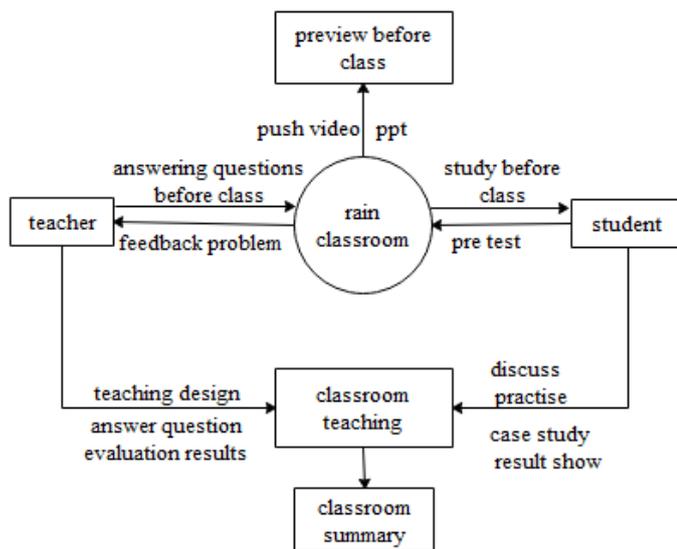


Fig. 1. Teaching procedures of mixed teaching mode

The module of ADO.NET is divided into four parts on the basis of the mixed teaching mode: data connection, data command, disconnected access, data parameters. Teachers are supposed to design every part and provide guidance for

preview through which students can understand what they have learned, requirements of mastering knowledge, videos needing to watch and self-practice. And teachers can record videos for each teaching module and every video is about 10 minutes. Regarding these materials, teachers can send them to students through rain classroom, and require students to learn by themselves according to the teaching guidance, finish practice through watching videos, and make a feedback. Then during the class, the focus will be checking knowledge, solving doubts, practicing programming, teaching practical cases, and summarizing knowledge. Therefore, MOOC teaching mode can help students understand knowledge before the class, and they have more opportunities to practice and summarize what they have learned in class so that they can better grasp learning content[3].

Various modern teaching tools are adopted to help MOOC teaching, such as "rain classroom" put forward by Tsinghua University and course teaching website. Rain classroom is based on We-Chat platform, by means of which teachers can set class group and invite students to join the group. Then students can receive ppt, papers, announcements and others sent by teachers. In addition, teachers can give students related materials before class, check the previewing condition, receive their feedback and lay foundation for class teaching. Course websites are used to hand in homework and talk on-line so as to realize the teaching mode of MOOC plus classroom.

The attempt in the module of ADO.NET has achieved good feedback. About 60% of the students can finish preview, solve doubts, practice programming and learning cases according to requirements. And they can better master database access technology, and consider applying the new mode in other modules.

B. Transform teaching mode and adopt the mode of students' teaching and teachers' commenting

In the traditional classroom teaching, teachers are regarded as the center. Students learn knowledge just by listening to teachers' teaching, which results in their lack of enthusiasm and being distracted by mobile phone or other things. Therefore, teachers can select some chapters and changed teaching mode, adopting organizing content before class and teaching in class by students, commenting and solving doubts in class by teachers. For example, in the module of built-in objects, students are encouraged or distributed to claim different built-in objects, preview before class, and teach in class within 15 minutes for each object. In addition, they are required to master and plan teaching content before class, finish PPT with the object, organize cases for class practice, teach and record videos to help others' preview. Teaching by themselves is a challenge and practice for students. Teaching content is organized from the perspective of students, and their freshness and motivation with learning can be improved by being the teaching center. As the observer and leader in class, teachers supervise students to listen carefully, and solve their doubts and make corresponding feedback. So both teachers and students can improve students' enthusiasm and positiveness.

*C. Drive teaching by project research and development, and transform projects into teaching cases*

The case teaching method means organizing students to study, research and practice by cases according to the demands of teaching objectives [4]. Case teaching can help students understand the popular technology in NET development and apply what they have learned into the reality. The teaching group of ASP.NET course is made of 5 young and middle-aged teachers, including 1 doctor and 2 associate professors. These 3 teachers, experienced in teaching and specialized in ASP.NET for 5 years, also shoulder some work of NET development projects at the mean time of teaching. Currently, they have finished the development in news release system and on-line stores, so they have experiences in project development. It can help teachers deepen the practice and application with NET, transform some projects to teaching cases and optimize teaching content.

According to course content, entire complexity of project and the degree of students' familiarity with projects, some representative, practical and familiar projects are transferred to teaching cases for class teaching and students' practice[5]. At present, some teaching cases have been formed such as general

corporation websites, on-line bookstore websites and on-line learning and management. They can be divided into various case modules for teaching.

At the beginning of the class, teachers are supposed to present entire project to students, summarize its function, and introduce case modules needing to be finished so that students can have direct cognition with it. The later teaching should be carried out with the case. And different case modules should be used in different teaching modules. Then students finish the module. In the module of Web controls, registered modules of cases can help students understand how to use each control; and in the module of ADO.NET, students can understand and apply data to finish data access through learning the basic data access method by means of MOOC; in the module of data controls, cases of commodity management and student management can help students learn how to use data to bind controls. Case teaching makes it possible for students to directly master the application of teaching content in practical project development, improve their learning interest, enhance the ability to apply and develop ASP.NET through practice. Related case modules used in each teaching modules are shown in TABLE II.

TABLE II. CASES USED IN VARIOUS MODULES

Serial number	Teaching modules	Application cases
1	Introduction, developer tools of html, javascript and jquery	Company website homepage
2	Web controls	Registration modules and login modules
3	Net built-in objects	BBS chat room
4	ADO.NET and three-tier architecture	Company website data access module
5	Data binding and data controls	On-line mall, product display and shopping cart
6	Web service and mobile connection	Opinion collection system

IV. REFORM EVALUATION MODELS TO PUSH PROCESS AND ABILITY-ORIENTED ASSESSMENT

The evaluation methods of programming and design course are usually writing, homework and usual performance. However, the application technology of ASP.NET is rather comprehensive. And some students are perfunctory even indifferent with homework, so their real level cannot be truly reflected[6]. Therefore, the process-oriented evaluation is adopted in ASP.NET programming design, mainly including the usual performance accounting for 40% and the final examination for 60%. The former mainly refers to students' preparation, class performance and case homework. The latter one adopts assessment by operating on the computer rather than the writing and homework, evaluating students' comprehensive application of ASP.NET programming.

In computer examination, students are required to finish a development of a small system similar with teaching case, including constructing database, establishing three-tier architecture, designing database access, compiling business access, and designing and realizing front-end interface. Evaluation content can completely manifest the basic content of Web development, which is helpful for testing students' practical abilities and entire mastering, and reflecting the total effect of teaching reform.

Regarding the final examination, teachers are supposed to tell students the evaluation mode and basic content in the first

class. Due to the random selection, students should be able to practice programming with ten small systems. As a result, students' learning attitude has obvious changing, and they can be more abstracted and efficient in learning.

V. CONCLUSION

The writer arranged the course content of ASP.NET Programming Design, and made the above exploration with teaching mode and evaluation models. From the perspective of the whole teaching process, MOOC teaching, case teaching and students' teaching can improve students' enthusiasm and change their attitudes. They can have more understanding with course content, and master the basic process and common technologies of Web programming development. It is seen from the final computer test that students can have rather ideal grades and the pass rate is more than 96%. And the excellence rate and average score are also higher than the previous round of teaching. Certainly, there are still many problems and details needing the further research for achieving the better connection of flipped teaching model and case teaching so as to more effectively improve teaching effects.

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