Teaching Conception of Web Design and Production Course under AIGC Background

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Abstract: With the increasing popularity of AIGC technology, the discussion on how to apply AIGC to classroom teaching is becoming more and more intense. According to the characteristics and teaching status of Web design and Production course, this paper constructs a course teaching process model based on AIGC, and elaborates the specific implementation of course teaching in the three stages of pre-class, in-class and after-class under the background of AIGC by combining the content of the module "List and hyperlink" as an application case. It is expected to provide reference for the relevant practice of computer programming courses in universities.

1. Research Background

In November 2022, OpenAI introduced ChatGPT, which can understand written prompts and generate coherent, natural text. In March 2023, OpenAI introduced GPT-4, which has more powerful language capabilities, can understand multiple forms of questions, and imitate complex human communication. On February 15, 2024, OpenAI released the Vincennes video model Sora on its official website. In addition to the rapid development of ChatGPT in foreign countries, domestic AIGC tools are also flourishing, such as Baidu's Wen Xin Yi Yan, Xun Fei's Xun Fei Spark, Ali's Tong Yi Qian Wen and other tools have the ability to parse text, images, codes and so on. The AIGC technology represented by ChatGPT is rapidly emerging globally, and these artificial intelligence technologies will have a profound impact on the field of higher education.

2. Research Status of AIGC

Artificial Intelligence Generated Content (AIGC), also known as generative artificial intelligence, refers to the use of machine learning models and deep learning technologies to automatically analyze and summarize existing big data. New text, images, code, audio and video are generated on this basis. Since ChatGPT became popular around the world in March 2023, it has aroused high attention from all kinds of school educators around the world to AIGC. At present, the development status of AIGC technology in the field of education is mainly in the stage of theoretical discussion and preliminary application. In terms of academic theory discussion, Professor Xin Yang believes

that the educational transformation based on generative artificial intelligence can provide opportunities for human-machine collaboration, knowledge breakthrough, downward compatibility, and iteration to "intelligence" in education. It will also make education transformation face challenges from human-machine conflict, knowledge magic, digital divide and detachment from reality [1]. Professor Jianli Jiao believes that generative artificial intelligence is of great significance and value to school education, especially its practical potential in promoting the digital transformation of school education[2]. Professor Youmei Wang et al. believe that ChatGPT, as a typical application of AIGC, can improve the completion degree and creative sense of teaching results, enhance the role sense and interaction of digital tutors, improve the usability and accuracy of adaptive learning systems, promote the wisdom and creativity of teaching strategies and methods, and support the generation and personalization of teaching feedback and evaluation[3]. In terms of practical application, Yuqi Bi et al. support students' conversational learning by using AIGC tools ChatGPT and Midjourney as learning scaffolding, believing that such conversational learning improves students' participation and self-efficacy, and promotes students' deep learning[4]. Teacher Yuhang Luo[5] believes that although AIGC technology cannot replace teachers to complete lesson preparation for the time being, it can effectively assist teachers to complete lesson preparation. Weirui Zhang et al. believe that AIGC tools are of great significance to geography teaching, but teachers should pay attention to the close combination of teaching content and teaching materials and the design of practical activities[6]. By designing an art class assisted by AIGC, scholars Zhao Yue et al. found that AIGC technology is an effective tool that can provide strong support for art teaching, artistic creation and subject education[7].

In addition, both domestic and foreign AIGC tools and platforms are booming. This research analyses the information of four AIGC tools commonly used in this study, as shown in Table 1 below.

Table 1: Four AIGC tools

AIGC tools	Development Company	Main Function
ChatGPT	OpenAI	Dialogue interaction, text generation, code writing
Midjourney	Midjourney	Image production
Wen Xin Yi Yan	Baidu	Dialogue interaction, text generation
Tong Yi Qian Wen	Aliyun	Dialogue interaction, text generation

3. Teaching Status of Web Design and Production Course

3.1. Course Description

Web Design and Production course is a required course for e-commerce related majors. It requires students to master the technology of web design, the basics of web design, HTML5 markup, CSS3 style, web layout, website design and other content. Through the study of this course, Students can understand the basic knowledge of web pages, the concept of web sites, and the use of Dreamweaver, the main tool software of web pages, and skillfully use the tool software of web pages, so that students have the knowledge and ability of web pages, website design and production. Through this course, students can develop the skills of using computers to independently develop web pages, websites, website uploading and testing, and develop the comprehensive ability of web design and production theory as well as practical development and application.

3.2. Teaching Status of The Course

The course of Web design and Production has many knowledge points and strong comprehensiveness, which requires high logical thinking of students. From the analysis of the current situation of the traditional teaching mode, there are mainly several problems: ① The traditional teaching mode pays attention to the teaching of basic knowledge and basic grammar and other theoretical knowledge, but lacks of training for specific project practice. ② The teaching arrangement of the traditional teaching mode is generally at the end of the course semester to require students to make a website as a big assignment, which is very difficult for some students. ③ The experimental time of the course is not enough, and the teacher does not have enough time to interact with the students.

4. Course Teaching Design Model based on AIGC

4.1. Teaching Design Model of Web Design and Production Course

According to the ADDIE instructional design model and combined with the characteristics of online and offline hybrid teaching of Web design and Production course, this paper constructs the instructional design model of Web design and Production course, as shown in Figure 1.
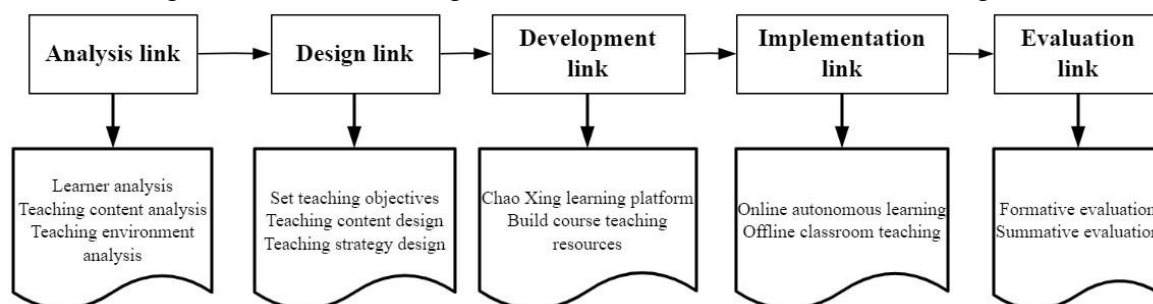

Figure 1: Teaching design model of Web Design and Production course

4.1.1. Analysis Link

Firstly, the learner analysis is carried out. The learning object of this course is the students in the first semester of sophomore majoring in e-commerce. Before learning this course, they have learned related pre-courses, such as computer application fundamentals, python programming fundamentals, Photoshop image processing technology fundamentals, etc. Students have general basic knowledge, ability and quality of computer application, familiar with computer hardware, operating system and Internet application. However, students of non-computer majors such as e-commerce have relatively weak programming thinking ability, and prefer hands-on practice to theoretical teaching. They have some difficulties in learning programming courses, for example, the initiative of programming is not high, correctness is not high, efficiency is not high. They need immediate positive feedback and a sense of accomplishment from small hands-on projects.

Secondly, the teaching content is analyzed. There are 10 modules in this course, which are: HTML5 introduction, HTML5 tags and attributes, HTML5 tags and attributes, CSS3 selector, box model, web layout, tables and forms, tables and forms, deformation and animation, practical development. The second to ninth modules are the basic knowledge and skills that need to be understood and mastered, and the last module is a complete large-scale website development project. In addition, each module has a separate mini-website development project in the first nine modules.

Finally, the teaching technology environment is analyzed. The course adopts the combination of

online and offline teaching, online uses Super Star learning Master for pre-class guidance and after-class feedback, and offline uses classroom teaching. In addition, the course requires a lot of software, ideas and materials. The operating software includes: Dreamweaver, Photoshop, and creative reference can use AIGC tools, such as ChatGPT abroad, Tong Yi Qian Wen at home, Wen Xin Yi Yan, etc. Material collection can use some professional design websites, or use AIGC tools Midjourney to generate image materials.

4.1.2. Design Link

The design process first needs to determine the teaching objectives. Overall, the teaching goal of this course is to master the following knowledge: HTML5 basic syntax and attribute tags, CSS3 selectors, CSS3 box model, float and positioning, tables and forms, multimedia technology application in web pages. The competency objectives of the course are: to be able to write web pages using HTML5 basic syntax; Can use CSS3 to control the expression of web content; Ability to design and develop a small website.

The second step of design is teaching content design. Three points should be paid attention to in the content design of blended teaching of Web design and Production course: ①Select the appropriate pre-class content; ② Classroom teaching process focuses on the key and difficult points of curriculum knowledge; ③ Choose the right web project for case practice. In addition, the choice of teaching content should be appropriately adjusted according to students' cognitive level, thinking ability and learning interest. The selection of teaching content materials should be integrated with students' specific majors, and pay attention to the depth, breadth and differentiation of the content to meet the individual needs of different learning levels.

The third step of the design process is the design of teaching strategy. The course of Web design and Production adopts not only traditional teaching, but also project teaching, task-driven teaching and case teaching.

4.1.3. Development Link

The course teaching in our school adopts the textbook written by the dark horse programmer. The course team where the author works has carried out secondary design and development of the teaching resources supporting the textbook and built a super star learning platform. These teaching resources include: micro-videos of course knowledge points, teaching syllabuses, lesson plans, teaching calendars, after-class exercises, etc.

In addition, in the course of lesson preparation, teachers can get rich reference materials and suggestions with the help of AIGC tools. They can also get customized teaching picture materials through the picture generation function of Midjourney, Wen Xin Yi Yan, Tong Yi Qian Wen and other tools and obtain customized teaching picture materials through text description language.

4.1.4. Implementation Link

The course is taught both online and offline. First of all, online learning is adopted in pre-class instruction. The classroom assigns pre-class instruction tasks and students learn online independently. Offline classroom teaching mainly focuses on the questions and difficulties of pre-teaching and knowledge. In addition, project-based teaching and case teaching are adopted in classroom practice, allowing students to internalize the knowledge and skills they have learned by completing web practice projects. After class, students complete the development exercises published by the learning platform, online learning before and after class, and students can get personalized guidance and questions from teachers through the learning platform.

4.1.5. Evaluation Link

The course adopts the combination of formative evaluation and summative evaluation for comprehensive evaluation. Formative evaluation refers to the usual score (accounting for 40% of the total score), the evaluation items include: web practice experiment report, usual attendance. The summative evaluation refers to the final work design (accounting for 60% of the total score). The first-level indicators examined include: the content of web design (accounting for 25% of the score of the work), the structure of web design (accounting for 35% of the score of the work), the artistry of web design (accounting for 25% of the score of the work), and the creativity of web design (accounting for 15% of the score of the work).

4.2. Teaching Process Model Based on AIGC

According to the teaching design mode of Web design and Production course in Figure 1 above, combined with the characteristics of blended teaching, the characteristics of students in our school, the teaching technology environment and other factors, the teaching process diagram based on AIGC is built as shown in Figure 2.
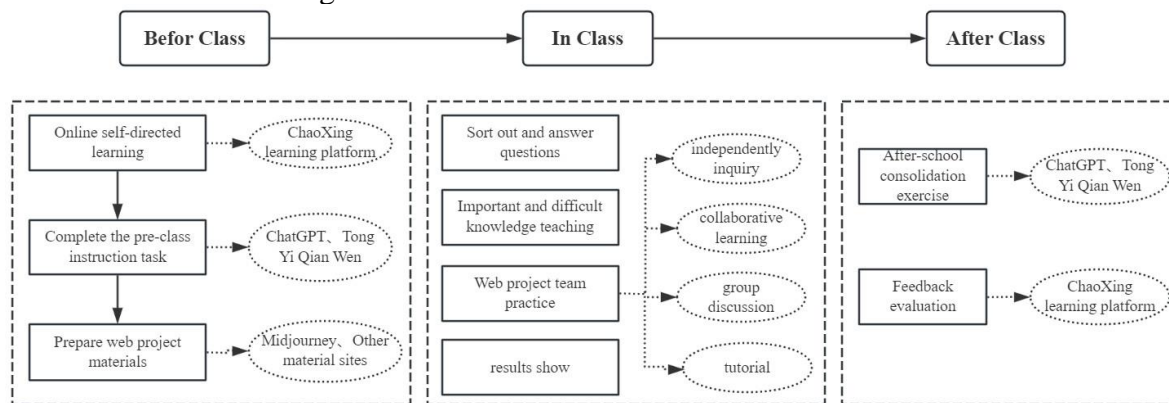

Figure 2: Teaching process model based on AIGC

5. Application Case of Web Design and Production Course

The following takes the module "List and hyperlink" in the course as an application case to explain the teaching process before, during and after class in detail. The knowledge structure diagram of this module is shown in Figure 3.
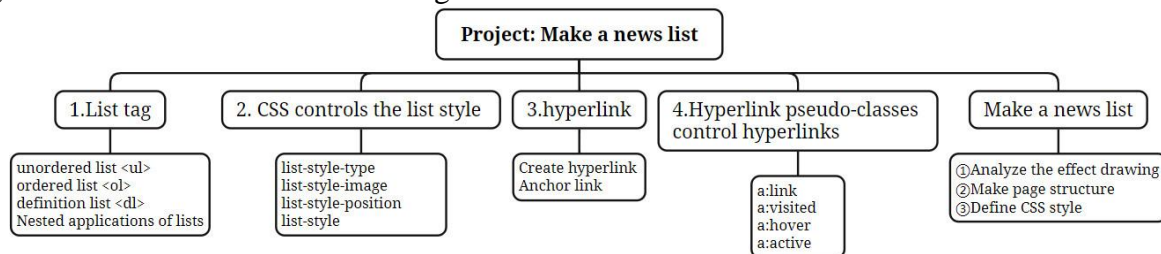

Figure 3: Knowledge structure diagram of "Lists and hyperlinks"

5.1. Before Class

The pre-class guidance task of this module is arranged through the Super Star Learning platform, and students can complete relevant exercises by referring to the reference opinions of AIGC tools

such as ChatGPT and Tong Yi Qian Wen the process of completing the guidance task. In addition, students need to prepare personalized image materials for classroom teaching web design practice projects. They can use the image generation function of Midjourney, Wen Xin Yi Yan, Tong Yi Qian Wen and other tools to prepare materials.

5.2. In class

Classroom teaching mainly includes four parts: sorting out and answering questions, explaining important and difficult knowledge, web project team practice, and showing results. First of all, most of the questions of some students in pre-class guidance can be answered through the learning communication platform, while a few questions need to be answered through concentrated classroom teaching. Secondly, the module's explanation of key and difficult knowledge is the first important part of the class, which is mainly taught by teachers and followed by students. Thirdly, in the practical part of the web project group, the students practiced the project of "Making news list" according to the group divided before class, which is the second important part of the class. Finally, the teacher selected several groups to display the team's web design results, and gave real-time evaluation.

5.3. After Class

After class, students need to complete the exercises related to this module, upload relevant works to the Super star Learning platform, and the teacher gives feedback and evaluation. In the process of completing the after-school exercises, students can use AIGC tools to search for creative references related to web design, or use image generation tools such as Midjourney to collect relevant materials.

6. Deficiency and Prospect

The teaching improvement of Web design and Production course in the context of AIGC has not yet entered the implementation stage, so there is no relevant feedback data to explain. Secondly, the course involves a variety of professional backgrounds of non-computer majors, and the subsequent design of the course content needs to be adjusted and integrated according to the professional background. Finally, whether course evaluation can accurately examine students' mastery of knowledge and skills requires quantitative data tracking and comprehensive analysis of several classes and semesters.

Acknowledgements

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