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Research on Curriculum Construction of Multimedia Technology Courses Based on Communication Engineering Major

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***Abstract*—The current education is no longer limited to the dissemination of knowledge itself, but rather to cultivate the ability to use knowledge, thinking and creative learning. How to reform curriculum teaching, make it adapt to the development of the times, and meet the needs of innovative thinking is an issue to be studied.**

Keywords—Curriculum Construcion; Multimedia technology; Communication Engineering

I. INTRODUCTION

Zhejiang Unversity City College is positioned to cultivate first-class applied undergraduate talents, and its Communication Engineering major cultivates senior engineering applied technology talents with knowledge of communication technology, communication system and communication network, who can engage in research, design, manufacture and operation in the field of communication, as well as in the development and application of communication technology and equipment in various sectors of national economy and national defense industry.

With the rapid development of multimedia and other computing technologies, the compression and coding of text, images, audio and video and other media and communication technologies are being more and more widely used in production and life. The course takes image, audio and video signal compression and coding as the main line, and aims at the application of multimedia communication, so that students can master the basic knowledge of image and audio/video signal processing, compression and coding, multimedia synchronous communication and artificial intelligence, and have the ability to develop multimedia communication system. However, with the rapid development of information technology, mankind is moving from the age of knowledge to the age of wisdom. The current education is no longer limited to the dissemination of knowledge itself, but rather to cultivate the ability to use knowledge, thinking and creative learning. How to reform curriculum teaching, make it adapt to the development of the times, and meet the needs of innovative thinking is an issue to be studied in depth.

We will continue to strengthen the reform and construction of course teaching through the "golden course" cultivation, improve students' ability to grasp the knowledge related to the course, improve students' ability to learn theoretical knowledge of the specialty, and guide the practice and application of the theoretical knowledge.

II. CURRICULUM DEVELOPMENT AND APPLICATION

This course was started in 2013 and has been offered to the Communication Engineering, Electronic Science and Technology majors in the Telecommunication Branch. Due to the strong theoretical nature of the course, in the course teaching process, focus on how to make students deepen their understanding and mastery of the theoretical issues involved in the course of a series of teaching research and reform exploration. The aspects involved in the course reform include: the summary of the difficult knowledge of chapters, the writing of study guides, the improvement of lecture PPT, the construction of active online classroom, the arrangement of literature reading, comprehensive experimental design and so on. The comprehensive experiments include live video broadcasting case, video on demand case, video production case, video calling system and its implementation - WebRTC+FreeSWITCH case, etc. The course is based on the offline classroom lectures, the learning guide, and the comprehensive experiment design. The course teaching is mainly based on offline classroom lectures, supplemented by online teaching resources. The online active classroom construction includes course materials, lecture PPT, links to extracurricular learning platform resources, online assignments, discussion board interaction, etc. Students are encouraged to use the time after class to combine online online course resources to preview, review and consolidate course knowledge, complete online assignments and practice, and "refresh the old and understand the new" after each class.

At the same time pilot literature reading and flipped classroom, let students through reading the latest and closely related to the course of academic literature to grasp the latest industry development technology, and through the flipped classroom for defense or discussion, to develop students' independent learning, teamwork skills, while improving students' interest in learning the course, and have some understanding of the future direction of development.

The overall assessment of the course is based on a percentage-based system, with a grade of 20% for attendance and classroom performance, 30% for regular assignments and labs (written assignments + BB platform assignments), 20% for course reports, and 30% for comprehensive labs. The marks set for the course assessment are reasonable and the overall grade is good, reflecting the students' overall good understanding and mastery of the knowledge points of the course. The introduction of practical sessions, such as the course paper, enables students to enhance their understanding and application of knowledge on the basis of mastering theoretical knowledge and to sublimate their book theoretical knowledge.

III. Fostering Curriculum Features and Innovation in "Gold Course"

A. Course Features

1). This course is a specialized course with a strong foundational role in the communications profession.

2). Courses focused on theoretical learning, involving more cutting-edge knowledge, and student mastery requires a combination of pre-course and post-course pre-review and e-learning processes.

3). There are some confusing concepts in the course knowledge that need to be explained repeatedly for students to be able to identify them.

4). Some of the post-class exercises involve more complex algorithms and require relevant and detailed examples to support learning.

B. Curriculum innovations

1). Literature reading flipped classroom: let students choose their own direction of interest and select a paper closely related to multimedia communication technology to study, either independently or by forming a research group to study collectively. Based on this thesis, students will read a large number of relevant literature, understand the principles and applications of the thesis on the application of multimedia communication technology, and write a reading report PPT, or practice demonstration project, the report should include an introduction of the author, article overview, research methods, experimental results, etc., the focus is to understand the text of the multimedia communication technology research methods and experimental procedures, in the 16-17 weeks of classroom exchange and discussion. We will build a literature database for this purpose, continually collecting and updating the latest literature relevant to the course, and iterating on student research to allow the flipped classroom to further enhance the course.

2). Curriculum topics flipped classroom: multimedia communication has a wide range of applications in the discipline and industry areas of the major, involving a large number of key technologies, on the basis of theoretical knowledge, try to combine the teaching materials and the actual development of the industry to arrange a number of course topics, including NLP, multimedia communication networks in the user experience quality management, the status and trends of mobile communication networks, multimedia network future trend analysis and so on. In each topic, a series of questions are asked a week before the start of the course, students are invited to consult the information in advance, teachers provide a large number of relevant information on the online course platform, and assign a certain number of large assignments to guide students to form their own ideas, and according to the learning ideas to further master multimedia communication technology.

Although the course has accumulated some course building foundation in the early teaching process, it still needs to be targeted to fit the characteristics of the course for further reform and construction, and the following is a plan for the next five years of course building reform measures, which is planned to be implemented in two stages.

The first phase (2020-2021), combined with e-learning resources, improve and constantly update the literature reading course question bank, the early literature library has been stored from the top meeting, top journals to domestic core journals and more than 100 articles and multimedia communication technology-related literature, in the continuous expansion of multimedia communication technology coverage, and combined with the current hotspot of artificial intelligence technology, will consider the introduction of Deep learning and multimedia data processing, such as slightly more difficult to reflect the latest development direction of the latest literature, while further screening of various types of literature, from shallow to deep, graded classification, the basic and preface level literature in an appropriate proportion of the integration as a library of student learning, to objectively reflect students' understanding and mastery of multimedia communication technology.

In the second phase (2022-2025), combining teaching resources such as online "mu classes", learning from master teachers with high teaching skills, broadening the content of course materials, further enlivening the interactive atmosphere in the classroom, continuously improving the learning methods of literature reading and flipped classes on course topics, and further enhancing students' interest in learning and classroom learning. We will continue to improve the lesson plans and PPTs, improve the preparation of after-school exercise problem-solving set, and strive to make this course a "gold course" that is widely loved by students.

IV. Expected Results

Through the cultivation of the "Golden Lesson" project, the construction of the "flipped classroom" has been strengthened, the teaching methods have been improved, the lesson plans and PPTs have been optimized, the capacity of the online question bank of the BB platform has been increased, the difficulty level of the questions in the question bank has been improved, and the flipped classroom has been continuously updated. Data bank, update the literature reading library, further improve the construction of active classroom, enrich the network active classroom construction dimension, complete the preparation of after-school exercise problem-solving set, complete

the preparation of student literature reading and discussion summary collection, and form 1 to 2 good multimedia communication technology thesis or research ideas, teaching and research to achieve organic integration. At the same time a reasonable arrangement of course assessment methods and grade composition ratio. Through the reform and construction of the course teaching, and constantly improve students' ability and level of knowledge related to the course, enrich professional knowledge, and guide professional practice and application.

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