The Course Teaching Reform and Exploration of Science and Technology Paper Writing

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ABSTRACT
The course "Science and Technology Paper Writing" is a quality development course for all majors of engineering. It is the foundation of all scientific and technological exchanges and plays a vital role in the entire teaching system. This article discusses how to conduct curriculum teaching reform and exploration in the teaching of Science and Technology Paper Writing through adopting a mixed teaching mode such as flipped classroom and seminar style, enhancing the teaching effect of the course, mobilizing students' interest in learning, enhancing the practicality of the course, and improving students' ability of writing, innovation and entrepreneurship, and linking theory with practice to solve practical problems.

Keywords: Science and Technology Paper Writing, Course teaching, Teaching reform, Exploration.

1. INTRODUCTION

The course "Science and Technology Paper Writing" is a quality development course for all majors of engineering, mainly introducing the basic knowledge of the types, categories, writing specifications and requirements, precautions, etc. of science and technology papers. Through a combination of case discussions and actual writing training, students are required to present technical work and research work completely and accurately in the form of essays, summaries, and innovation and entrepreneurship plan training project notifications.

2. ANALYSIS ON THE STATUS QUO OF SIMILAR COURSES IN CHINA AND FOREIGN COUNTRIES

In view of the particularity of science and technology papers, both liberal arts writing skills and science analysis skills are taken into account in the course teaching, and the requirements for teaching content, teaching methods and teaching capabilities are quite high. In addition, the current textbooks for Science and Technology Paper Writing are mainly written norms and skills, and the teaching methods are mainly lectures. There is no lack of insipidity in the teaching of course. Students can't get direct practical training, and the acquisition of knowledge stays at the perceptual level. In this case, teaching and practice are seriously detached, and the quality of Science and Technology Paper Writing teaching is often difficult to meet the teaching requirements, which directly affects the application level of students' subsequent paper writing [1].

The teaching content of Science and Technology Paper Writing includes the overview and classification of science and technology papers, the conception and development of the subject, the technical issues of science and technology papers (professional terminology, quantity and unit, number and letter specifications, chart production), research paper writing, graduation thesis writing, etc. Today, with highly developed information, the above-mentioned teaching content still remains on the content of the courses initially offered by colleges and universities in the 1990s. Although many colleges and universities have integrated

document retrieval courses into Science and Technology Paper Writing course, they have put forward the concept of teaching reform to "creatively study and advance together" in document retrieval and writing courses, however, as far as the content of pure Science and Technology Paper Writing is concerned, the content of this course lags behind the times. Therefore, in this context, it is necessary to add and delete the original curriculum content, get rid of outdated knowledge points, introduce novel content, and add the educational concept of innovation and entrepreneurship [2].

3. THE NECESSITY TO START THE CLASS

The writing of science and technology paper is the basis of almost all scientific and technological exchanges. The main purpose of the "Science and Technology Paper Writing" course is to change the situation where knowledge and essentials of scientific paper writing need to be explored by oneself, and to improve the writing ability of scientific papers. As everyone knows, undergraduates can graduate and get a bachelor's degree only after completing their graduation thesis or graduation design and successfully defending it. At the same time, undergraduates are the new force of future scientific and technological workers.

The establishment of the course "Science and Technology Paper Writing", on the one hand, cultivates writing standards and preliminary writing skills for undergraduates' graduation thesis or graduation design; on the other hand, it provides guidance on the essentials and skills of writing science and technology papers for students who are studying for a master's or doctoral degree or engaged in scientific research in the future in order to have innovative thinking in future scientific research work and smoothly carry out the writing and publication of papers.

4. TEACHING CONTENT AND SYSTEM

With "innovation and entrepreneurship education" as the starting point, and according to students' learning and cognition laws, a teaching system of phased, multi-level, modular, open and comprehensive projects is established.

This course is a quality development course. Students can understand and master the types, categories, characteristics and writing points of

scientific and technological articles by studying and practicing the literature reviews, thesis abstracts, project applications, PPT, etc. used in the graduation design. And through the combination of case discussion and actual writing training, students are required to be able to present technical work and research work completely and accurately in the form of essays, summaries, reports, etc. [3].

5. TEXTBOOK AND CASE CONSTRUCTION

5.1 The Project Case Is Rich in Materials

The members of the project team have rich engineering practical experience and rich case materials accumulated over the years for this course to meet the needs of real problems.

5.2 The Sample of Discussion and Comments Is Sufficient

It collects a lot of curriculum design specifications, graduation design specifications, literature reviews, and innovation and entrepreneurship project notifications of previous students as teaching materials for discussion, and these are what students must do in the future, which can make students feel authentic.

5.3 Teachers Have Rich Experience

The project team members have rich teaching experience, understand the characteristics and deficiencies of students, and are able to guide students to discuss, guide correctly, and summarize and comment; project team members have also undertaken a number of teaching reform projects and have enough experience to complete this project.

5.4 Abundant Reference Materials

It provides 5 kinds of paper and 4 kinds of networks, a total of 9 kinds of teaching reference resources for students to use, which is enough to meet students' needs.

6. TEACHING METHODS

6.1 Introducing the Curriculum Implementation Outline and Standardizing Teaching and Learning Behaviors

The syllabus is divided into 8 parts: basic course information, expected learning outcomes, teaching calendar, teaching materials and reference materials, assessment methods and grading standards, successful skills, academic integrity regulations and others. It not only fully regulates the teaching process of the whole course, but also puts forward detailed and specific academic requirements and behavior standards for students. It suggests learning methods, puts forward suggestions for success, emphasizes academic integrity, and clarifies the performance evaluation standards. The course implementation syllabus is a course agreement between teachers and students. It is a reference book for students to learn. It enables students to fully understand the teaching process of teachers and the requirements of students, and is also the basis for teaching quality evaluation.

6.2 Students Sign the Academic Integrity Commitment

In response to the fact that academic integrity is not optimistic, the method of allowing students to sign an academic integrity commitment in the first class is adopted to convey to students a clear and firm message: academic integrity is a matter of principle, and zero tolerance and one vote against meaning veto will be adopted.

6.3 The Full Implementation of Flipped Classroom

In the allocation of the entire 16 class hours, 5.5 class hours are taught, less than one-third, and the rest are seminars, student speeches, presentations and other links. Even some theoretical concepts are explained by the students on the stage after self-study, and then summarized by the teacher. And in this way can the student-oriented and teacher-led flipped classroom concept be implemented.

6.4 Strengthening the Four Abilities of Self-study, Research, Academic and Expression

Preview before class: the teacher arranges the content of the next class preview in advance, and the students tell it in class first;

In-class seminars: teachers use student exercise and actual cases as materials, and students conduct seminars in accordance with the norms, point out gains and losses, and brighten their views, and teachers play the role of guidance and comment;

Practical hands-on: Taking actual cases and academic needs as materials, students are required to use professional knowledge to build models, solve, analyze, summarize and write academic papers, write literature reviews, innovation and entrepreneurship project applications, PPT materials and other documents; there are a total of eight classes, and students have to complete seven written assignments (including "course understanding and learning planning" at the beginning of the course and "course experience and suggestions" at the end of the course);

Practice expression: teachers need to give students as many opportunities for written and oral expression as possible to exercise their complete, accurate, vivid, and concise ability to express their opinions [4], [5].

6.5 The Curriculum Closely Integrates the Students' Academic Practice

The content taught in the course and what students are required to practice writing are all content closely related to the student's academic work, such as literature reviews, abstracts, project applications, PPT, etc. to be used in the graduation design.

6.6 Elaborate Design to Achieve Full Participation of Students Without Leaving Blind Spots

Due to the large number of students, it is impossible for all students to have the opportunity to speak in class. In order to give every student the opportunity to participate, and to prevent some students from deliberately not participating in the discussion, it is specially formulated that students must take notes in class (spot check), the opinions of the seminar must be organized into homework (required), all assignments must not be the same for

more than two people (required, involving academic integrity issues) and other measures to ensure that all students participate in the study.

6.7 Putting Innovation and Entrepreneurship Education into Practice

The course not only explains and discusses the actual application form of previous students as an example, but also requires each student to combine their own majors to develop their own topics and write application forms for college students' innovation and entrepreneurship training programs, and then produce a PPT for the defense, which organically integrate the learning of the course with students' innovation and entrepreneurship practice activities. After the course is over, students can find the opportunity to declare the actual project [6], [7], [8].

7. EXPECTED TEACHING EFFECT AND CHARACTERISTIC DEMONSTRATION

7.1 Implementing "Three Reforms and One Cultivation", and Building a New Model of Engineering Education Reform

It is necessary to thoroughly implement the spirit of the "New Era National Undergraduate Education Work Conference for Higher Education Institutions", with the goal of training applied talents, and the main line of "increasing academic difficulty, improving training quality, and emphasizing academic integrity", and implement the "three reforms and one cultivation" reform model, that is, to reform the teaching content and closely integrate with students' academic needs. It's also needed to change the teaching model with students as the main body and teachers as the leading factor, reform the performance evaluation method, pay attention to ordinary times and practice, and combine teaching and education to cultivate academic integrity. In terms of curriculum implementation and evaluation, special attention is paid to innovating teaching content and methods to promote the achievement of training effects and training goals.

7.2 Focusing on the "Two Degrees of Achievement" and Innovating Curriculum Implementation and Evaluation Methods

In the process of in-depth promotion of teaching reform, it is necessary to emphasize the orientation of training effects and the achievement of training goals, carefully arrange curriculum design, and innovate implementation and evaluation methods. The curriculum has launched an "executive outline", which on the one hand allows students to fully understand the teaching process of teachers and the requirements of the curriculum for students, on the other hand, it also plays a two-way restrictive role in the whole process of teacher-student interaction. The course has the following two innovations: one is to advocate the "student as the main body and teacher as the leading" model. Employing a combination of flipped classroom and seminar-style teaching, each class is equipped with seminars, student speeches and explanations, presentations, and other links. Some theoretical concepts in the course are also explained to everyone by the students after self-study, and then summarized by the teacher, so as to truly implement the student-oriented and teacher-led flipped classroom concept. The second is that the curriculum closely integrates students' academic practice. Teachers pay special attention to the "closeness" with students' academic work when designing the content of courses and students' practice of writing content. It contains literature reviews, abstracts, project applications, PPT, etc. to be used in graduation design. Through the four aspects of preview before class, in-class seminars, hands-on practice and expression of exercises, the four abilities of students' self-study, seminar, academic and expression are continuously cultivated, which favorably supports the requirements of communication, self-study, literature retrieval, and writing of graduation design specifications (thesis) for students to meet graduation requirements.

7.3 Paying Attention to "a Lightspot Means" and Promoting the Cultivation and Improvement of College Students' Practical Innovation Ability

The college students' innovation and entrepreneurship training program is the highlight and feature of teaching work, and it is also an important starting point and measure for in-depth

development of college students' practical innovation ability. It is necessary to pay attention to inheriting and carrying forward the characteristics, continuously incorporate new elements, move the implementation gate forward and refine the process.

The curriculum breaks the traditional mode of "transmitting innovation and entrepreneurship training projects from top to bottom", and trains students to prepare knowledge and ability reserves in advance. It not only uses the actual declaration form of previous students as an example to explain and discuss, but also requires each student to combine their own majors, draw up topics on their own, write applications for college students' innovation and entrepreneurship training programs, and then make a PPT for defense, which organically integrate the learning of the course with the students' innovative and entrepreneurial practice activities. After the course is over, if there is a suitable project, students can "certainly do a good job if they are called upon" and quickly apply for the project.

8. CONCLUSION

Through the teaching reform of the Science and Technology Paper Writing course, students will understand the types, categories and characteristics of science and technology articles, as well as the writing methods and principles of various science and technology articles; at the same time, through the analysis, discussion and calculation of actual problems, students can practice the writing of literature review, innovation and entrepreneurship plan training project declaration, science and technology thesis, course design report, graduation design thesis, etc.; students are required to write the innovation and entrepreneurship plan training project declaration in combination with their majors, and try to use PPT for introduction and defense, which cultivates their rigorous and serious habits and a scientific attitude of seeking truth from facts.

AUTHORS' CONTRIBUTIONS

This article is independently completed by Na Xiao.

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