

The Pedagogical Reform of "Packaging Chromatic Science " with the Internet Plus Strategy

Qinling Dai
School of design
Southwest Forestry University
Kunming, China
daiqinling@126.com

Huajie Shen
School of Material Science and Engineering
Southwest Forestry University
Kunming, China

Leiguang Wang*
College of big data and intelligence engineering
Southwest Forestry University
Kunming, China
wlgain@126.com

Abstract—Packaging chromatic science is a professional basic course for many major courses of packaging engineering. In the new era of "Internet plus", it's imperative to carry out a student-centered comprehensive pedagogical reform. The undergraduate classes of packaging engineering are taken as samples in this article. Besides this article conduct a questionnaire survey on undergraduate students of packaging engineering. A series of problems of current situation of the teaching of the packaging chromatic science course are found and analyzed. To solve these problems, this article explores the pedagogical reform of packaging chromatic science with the internet plus strategy, so as to achieve the best pedagogical effect.

Keywords—Packaging chromatic science; Pedagogical reform; Internet; Undergraduate students

I. INTRODUCTION

With the progress of science and technology and the rapid development of education informationization, new technologies and knowledge related to curriculum are rapidly updated, and the learning methods of undergraduate students are also changing at an alarming speed. The traditional face-to-face teaching mode is not suitable for the current situation, so it is urgent to research and practice the reformation of the curriculum course[1]. In the Internet plus model, the Internet is a technology platform, while "plus" is related to the specific domain knowledge and can inspire unlimited creativity. Internet technology has brought a profound impact on traditional teaching. The emergence of large-scale open online learning courses and the mixed teaching modes such as micro-class and flipped classroom having gradually introduced into the classroom of colleges and universities, have a strong impact on traditional teaching mode[2] [6]. In order to meet the needs of the times under the background of "Internet plus", it is imperative to reform the teaching of packaging chromatic science. The packaging chromatic science includes not only the color phenomena, rules and the quantitative description of packaging color, but also the theory of packaging color

reproduction and the practical application of packaging color theory. It's a course that combines "art" & "craft" and a professional basic course for many major courses of packaging engineering, such as Packaging Decoration & Molding Design, Packaging Printing Technology, Graphic Design, Packaging Technology and so on. It occupies an important position. Aiming at cultivating innovative and practical talents of "craftsmen", this paper puts forward a series of teaching reformation measures for the course of Packaging chromatic science from the aspects of teaching contents, teaching mode and teaching methods.

II. QUESTIONNAIRE SURVEY OF PACKAGING CHROMATIC SCIENCE COURSE AND ANALYSIS OF TEACHING SITUATION

In order to deeply understand the learning dynamics of students and make the teaching reformation of the curriculum course dependable, the author carried out an online questionnaire survey on the students who had studied the course of packaging chromatic science. The questionnaire includes curriculum course contents, teaching methods, teaching process, undergraduate students' expectation of the course and so on. The survey results are summarized as follows:

A. The survey about curriculum course contents

In terms of curriculum course contents, 53% of undergraduate students thought that the curriculum course contents of Packaging chromatic science conform to the internal logic of color science and the order of students' cognitive development, and 27% of the undergraduate students thought the contents of the curriculum course were logical but abstract, and 20% of the undergraduate students thought most of curriculum course were logical and related to real life. As shown in Fig. 1.

This work was financially supported by Southwest Forestry University Foundation No. YB201705.

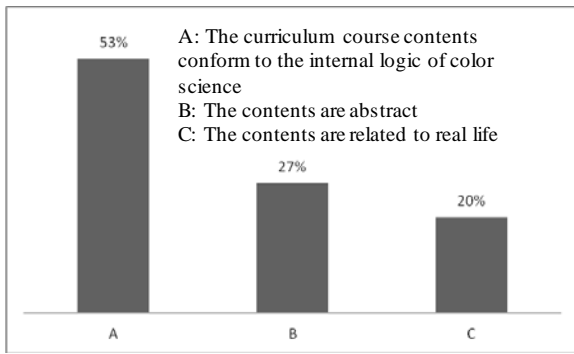


Fig. 1. The survey about curriculum course contents

Packaging is not only to meet the functional, but also to achieve people's visual needs, which combines "craft" and "art". With the entry of the "Internet plus" era, the curriculum course contents cannot be updated in real time and cannot contain the latest technology in practical teaching, which results in some undergraduate students' opinion that the contents of the curriculum course were abstract and out of touch with the real life.

B. The survey about teaching methods

In terms of teaching methods, in addition to expository method, most undergraduate students thought that teachers used a variety of teaching methods, and only one thought that only single teaching method was used.

C. The survey about undergraduate students' learning expectation

According to the questionnaire survey data, the practical content of the course is weak, as shown in Fig. 2. 57% of the undergraduate students expected to increase the experiments of color theory in packaging design in the future, 26% of the undergraduate students expect to deepen their understanding of the theoretical knowledge of chromaticity and their ability to represent and calculate the colors in different color systems, and 17% of the undergraduate students expected to increase the experimental parts of color measurement and calculation in curriculum course. Packaging chromatics is an important branch of color science. Undergraduate students should not only master of color theory, but also have the ability of the practical application of color.

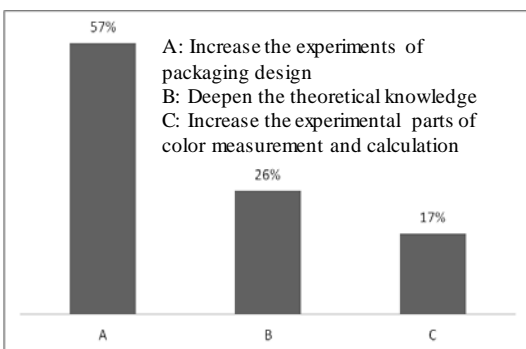


Fig. 2. The survey about undergraduate students' learning expectation

D. The survey about undergraduate students' learning enthusiasm

The learning enthusiasm of undergraduate students is not high, and teachers' comprehensive quality needs to be more improved. In terms of attracting students' attention in class, 47% of the undergraduate students thought that the teacher's teaching language was concise and the charming so as to attract undergraduate students' attention; 37% of the undergraduate students thought that the teacher's expression in class was precise and not verbose; 6% of the undergraduate students thought that the teacher's teaching language was inaccurate and verbose; 10% of the undergraduate students thought it indifferent. In addition, 60% of the undergraduate students thought that teachers can control the teaching rhythm according to the classroom course and students' feedback; 33% of the undergraduate students thought that teachers paid attention to undergraduate students' classroom feedback, but the controlling of teaching rhythm needs to be improved; 7% of the undergraduate students thought that it does not matter. Teaching is an interactive process between teachers and undergraduate students. Teachers play the leading role and undergraduate students are the main body. To improve undergraduate students' learning enthusiasm is teachers' important qualities.

III. EXPLORATION ON CURRICULUM COURSE REFORMATION OF PACKAGING CHROMATIC SCIENCE

A. The setting of curriculum course contents

When setting up the curriculum course content, firstly, we should pay more attention to the internal logic of color discipline and the order of students' learning and cognitive development. Secondly, we should take students' real life into account. Thirdly, combined with the discipline characteristics of color science, the resources such as MOOC videos, exercises, solutions, etc. should be developed, and the resources should be pushed to students' mobile phone client through the intelligent teaching tool, such as rain classroom[3][4] launched by "xuetang online". The learning resources should be intelligent, systematic and real-time. The specific curriculum course contents are arranged as shown in table I.

TABLE I. SETTING OF CURRICULUM COURSE CONTENTS AND TEACHING METHODS OF PACKAGING CHROMATIC SCIENCE

The curriculum course contents	Class hour	The main teaching methods	Resources
The basic concept of color	2	Expository method	Slides
Physiological knowledge of color vision	2	Expository method, Discussion method	Slides
Additive and subtractive methods of colored light	2	Demonstration method, Discussion method	Animation
Phenomenon and theory of color vision	4	Demonstration method, Visiting method	Slides
The rendering systems of color	4	Expository method, Practicing method	Exercises and The explanation of answers

Cont. to TABLE I

CIE systems of color	4	Expository method, Practicing method	Exercises and The explanation of answers
The density of Color	2	Inquiry method	Videos
The reproduction theory of packaging color	6	experimental method, Practicing method	Videos
Psychological theory and design application of packaging color	6	Expository method, experimental method	Material object, Videos

B. The setting of main teaching method

For different chapters of the course, different main teaching methods are adopted. As shown in Table 1 above, during the whole course, various teaching methods, such as language transmission, direct perception, practical training and guiding inquiry are adopted comprehensively[5]. In the basic concept of color and physiological knowledge of color vision parts, the language transmission of information such as lecture and discussion methods are mainly used. In the chapters of additive and subtractive methods of colored light and phenomenon and theory of color vision, the methods of direct perception are mainly used. In the chapters of the rendering systems of color and CIE systems of color, in order to facilitate students' understanding and mastery, the method of language transmission of information and practicing are mainly adopted in the process of teaching. In the chapter of psychological theory and design application of packaging color, the method of guiding inquiry is mainly used. In the chapter of the reproduction theory of packaging color, we use teaching method based on practical training.

C. The setting of practical parts

According to undergraduate students' feedback, and from the aspects of training students' practical analysis ability and deepening their understanding and application of basic theoretical knowledge, practical parts are added in the corresponding chapters. In the chapter about the color CIE systems, the experiments on color difference measurement and analysis for color printing are added. This experiment not only enables undergraduate students to grasp the working principle and operation of spectrophotometer, but also to deeply understand each color system and its formula of calculation, and to identify and calculate the color difference produced by printing. In the chapter of color density, the experiment on measurement and calculation of color printing is added. The experiment makes undergraduate students understand Yule-Nielsen Equation to determine the relationship between dot area ratio and dot density, and Murray-Davis Equation to calculate dot gain. In the chapter of the reproduction theory of packaging color, the experiment of calculating quality parameters of color inks is added to enable students to master

the method of identifying ink chromaticity. In the chapter of psychological theory and design application of packaging color, in order to make students master the key points of psychological theory of color in packaging design, the practicing of packaging design is increased. The whole course consists of 8 experimental hours. Each experiment is recorded in short video and sent to undergraduate students' mobile client so as to improve the construction of online resources.

D. Enhancing teachers' comprehensive quality and motivating undergraduate students' learning enthusiasm

Firstly, teachers should fully prepare teaching plan before class, including all teaching materials: subject matter, calendar, courseware, video files, plans and so on. Secondly, according to the feedback of undergraduate students' learning achievements, teachers should timely adjust the classroom contents after class. Thirdly, teachers should consciously temper teaching language to make it concise and full of artistic charm, improve undergraduate students' learning enthusiasm and stimulate their desire for knowledge in class.

IV. CONCLUSION

First of all, the overall curriculum course is set up and arranged, and the teaching hours are allocated reasonably in the paper. What's more, the intelligent, systematic and synchronous online teaching resources are put forward to undergraduate students, and students' enthusiasm and autonomy can be improved. In a word, this paper explores the pedagogical reform of Packaging chromatic science with the internet plus strategy, so as to achieve the best effect between "teaching" and "learning".

REFERENCES

- [1] Shan xian. Exploration on the teaching reform of linear algebra under the background of "Internet + education" [J]. Education and teaching BBS, 2018, 394(52):124-126. (In Chinese)
- [2] Hua haiyan, Lin hua. Optimization of theoretical mechanics teaching and cultivation of innovative thinking in the context of "Internet +" [J]. University education, 2018, 101(11):16-20. (In Chinese)
- [3] Qian Lu. MOOC Survey: Taking School Online as an Example [D]. Changchun: Northeast Normal University, 2016:13-18. (In Chinese)
- [4] Yuan Bo, Zhao Haimei, Zhang Chengping, et al. Visual Analysis of Postgraduate English Learning Behavior Based on Rain Classroom [J]. Modern Educational Technology, 2018, v.28; No.205(05):69-75. (In Chinese)
- [5] Zhou Yihui. The Characteristics of the Times in the Application of Teaching Methods [J]. Sichuan Education, 2016(9):24-24. (In Chinese)
- [6] Wang xiuzhen, wang fenmei, pei bin. Construction of intelligent teaching model based on rain classroom [J]. Computer education, 2018, No.280(04):139-142 (In Chinese)