

Reform and Practice of Multimedia Technology and Application for Applied Undergraduates

Zhong jiaming¹, Zhu geng²

¹Xiangnan University, Chenzhou 423000, China

²School of computer and network security, Dongguan University of technology, Dongguan 523808, China;

Abstract: According to the characteristics of applied undergraduate talents, this article demonstrates the characteristics of Multimedia Technology and Application course, analyzes the teaching reform of the course in several aspects such as content of the course, practical teaching, teaching methods, assessment and evaluation, and analyzes and discusses the tasks and processes of the course design in detail.

1 Introduction

As Chinese economy has entered into New Normal, the structural contradiction of our higher education is more typical and homogeneity-oriented. In regard to this, the third committee of Ministry of Education has proposed to promote local universities' transformation into developing applied talents, and to improve the economic and social development abilities and innovation-driven development abilities in service area of universities. To develop applied talents, it is important to understand and grasp the characteristics of applied undergraduate talents. They should have a certain degree of depth and width of knowledge and obtain a complete, systematic, scientific and professional knowledge system, which allow them to meet academic standards of undergraduate education according to Higher Education Law of the People's Republic of China. As for ability and quality requirements, high-quality applied talents should not only have certain practical abilities and strong innovation ability, but also have high professional qualities and certain scientific and humanistic qualities [1-3].

2 Characteristics of Multimedia Technology and Application course

Multimedia technology is a new technology and course which is formed by the inter-infiltration and integration of computer technology, communication technology and modern information technology. Today, it has been applied to all aspects of society, economy and science, and as a result, brings tremendous changes to people's life, view and production activities. Therefore, it is significant for modern university students to learn and acquire the basic theories, methods and standards of multimedia technology.

Multimedia Technology and Application course is an important general course for popularizing the application of information technology, which aims to improve students' comprehensive abilities on collecting, manufacturing and designing multimedia such as planar static/ dynamic pictures, audios, videos and animations [4]. Based on characteristics of applied undergraduate talents, the teaching of multimedia technology courses should neither be considered as operating media materials with software tools nor pure theories learning, but should make students understand, learn and obtain the basic concepts, theories and methods of multimedia technology, grasp all kinds of medias and media processing technologies, acquire data compression techniques and relevant international standards on multimedia data compression, understand and obtain hardware and software basics of multimedia technology and achieve multimedia information management technology. Finally, through learning the course, students will obtain the basic theories and practical technologies of multimedia technology, hold its development direction as well as be armed with the basic knowledge and abilities to utilize multimedia technology. In detail, contents of the course include: teaching students various multimedia development tools and designing techniques such as PHOTOSHOP planar image design, FLASH animation design, AUTHORWARE dynamic demonstration system, audio recording and processing and PREMIERE video recording and editing; at the same time, enhancing students' various processing abilities of collecting, processing and composing multimedia materials [5]. By improving actual and practical abilities, students will meet businesses' requirements of basic techniques and methods on photo processing and advertising designing and manufacturing, etc. Furthermore, it provides material designing and knowledge supports for multimedia database designing and related application systems developing.

3 Teaching reform and practice of Multimedia Technology and Application course

3.1 Reform of course's contents

Multimedia technology is a comprehensive technology with multi-crossed disciplines, thus, the course aims to let students achieve the skeleton of multimedia technology and comprehensively and systematically introduce the principles and applications of multimedia technology on the basis of new achievement of multimedia technology. It not only focuses on introducing theories, methods and standards, but also gives considerations on discussions of specific techniques and examples of solving practical issues; it not only describes mature theories and techniques, but also introduce the new development of relevant areas

of multimedia technology. During teaching the course, it should pay attention to the basic techniques of multimedia, explain various medias and its processing techniques data compression techniques and information management techniques in detail and multimedia's hardware and software techniques in short. There are different requirements of teaching contents and teaching hours for computer major and non-computer major. Students major in computer have higher requirements on theoretical depth and technological innovation while those of non-computer major put more emphasis on application design ability, but different teaching modules can be worked out for options of students from different majors and having different requirements. Adjustment of teaching hours will be determined in accordance with the importance and practicability of the contents of teaching modules, requirements of students, targets of course construction and other factors. Table 1 shows specific arrangements.

Table 1 Arrangements of teaching modules of the course

No.	Teaching modules	Computer major	Non-computer major	Notes of allocation
1	Overview of multimedia technology	12	4	Professional students need deeper theoretical supports.
2	PHOTOSHOP designing	4	10	Non-professional students pay more attention to application designing.
3	FLASH animation designing and programming	12	8	Add code programming for professional students.
4	AUTHORWARE designing	2	6	Non-professional students pay more attention to application designing.
5	Video composition processing	2	4	Limited by experimental conditions

3.2 Reform of practical teaching

Multimedia technology has rich contents which is both strong theoretical and strong practical. In order to deepen students' understanding of the course's knowledge and improve their abilities to solve practical issues, practical teaching should be strengthened. Curriculum Design is an experimental course of the Multimedia Technology and Application course, which mainly develops students' developing and designing abilities of multimedia projects and is an important way to develop applied talents. It needs to utilize various designing methods in theoretical courses to connect different multimedia designing software in series and finally generates a payable video document by multiplayer mode and connecting software developing processes.

Because there needs a lot of work to develop multimedia application system and demonstration system, it is difficult to complete the work by only one person. Thus, it usually be done by a team formed by several people, which is in favor of allowing different students to play

more important roles in system development and to adapt to real environment of social software development better. There are often 5 to 8 people in a team. The design topic is chosen by teachers or the team leader according to designing requirement. Each member should have his or her independent design direction and sub-topic. Everyone has different design content so that they can take the opportunity to show their design talents. Topics often include landscape, folk-custom, sports, figures, food, etc. which is in favor of picture collecting, animation manufacturing and lines designing, etc. For example, a team taking "Chinese food on the tip of the tongue" as its topic, each member should design sub-topics with different cuisines such as Hunan Cuisine, Guangdong Cuisine, Beijing Cuisine or other local cuisines. In general, it does not recommend students to design topics like history, politics or religions because it is hard to collect relevant materials and they are sensitive. Design mainly reflects students' abilities of image processing, animation designing and line designing, and the end products should be beautiful images, humorous languages or appreciation-deserving animations. Table 2 shows specific division of work for team members.

Table 2 Division of work for Curriculum Design team members

Role	Team leader	Team member	Tester
Task	Choose topics, plan and divide work	Design one's own sub-topic independently	Test images, audios and videos
Requirements	Know the whole process of	Know multimedia design	Test bugs and problems of

	development, have communication ability, be able to solve key technical issues	methods, write files	the design of each other
Number of members	1-2	5-8	5-8

In the process of project design, working out the general idea and unifying the style should be the first step. Team members should collect pictures (with unified size and photographic style) needed by the task from actual environment other than from others on the internet. We emphasize the originality of works and materials. If a student uses more than 30% of pictures of others in his work, the work will be negative or disqualified. By using PHOTOSHOP CS, pictures will be tailored into unified sizes (e.g. 800*600 pixels) as animations require and will be used in follow-up work after finishing PS, deformation and other treatment. With previous processed pictures and designed lines, animations or demonstration systems will be produced by FLASH or AUTHORWARE, i.e. in the form of PS+FLASH or PS+AUTHORWRE, or video systems will be developed by integrating the three. FLASH is recommended to design animation because it provides good effects on lines and motion design though it has bigger technical difficulties. AUTHORWRE is comparatively simple but there exist compatibility issues between AUTHORWRE and other software files. For example, files issued by FLASH should be reduced on version 7.0, or pictures cannot be displayed when it plays in AUTHORWRE. It demands each member to collect no less than 10 pictures of which at least 8 should be PS processed, and animation made by each member should be not less than 20 seconds and the whole team’s animation should be not less than 2 minutes. Then, students test video files of each other and put forward the reviews of correction. According to these reviews, students adjust the content or rhythm of videos, then bub their own videos and add them into video files. Works should contain pictures, words and sounds, some of which without sounds will not get high opinions. Each member has independent demonstration file and team leader connect them in series into one file. Team leader or major contributor are responsible for connecting disperse works of each member into a complete and organic animation file in accordance with storyline. And the final work should be an independent file (in form of SWF or EXE) which can be displayed in cross platforms directly.

At last, each member should write at least 4 pages of project documents, i.e. Final Report of Project, or he fails the exam. File writing ability is another important ability except design ability. Software companies have high requirement for files, so students are necessary to obtain the ability. Each member introduces his design idea and procedures and software processing procedure based on his design, and inserts some pictures in the file for comparison. Then, team leader compiles each member’s files to a complete and organic file other than simply overlaps them, and adds the introduction of the project and the work distribution chart of each member to the first page of the file, indicating completing work of each member and tips of the major contributor. According to students’ videos, files and the work distribution chart, teacher gives every

student an individual score, not a score for a team, so that students in a team will get scores of different levels based on their own contribution and completing works.

3.3 Reform of teaching methods

This course combines theory teaching with practice teaching and focuses on heuristic education, which begins with basic concepts, then step by step, highlighting difficult and key points. In particular, it introduces new knowledge and trends of the subject to improve teaching qualities and provide more information. In class, teachers use PPT and general outline of the course, experimental guidance, electronic teaching plan, multimedia courseware and other teaching resources.

Contents of Multimedia Technology and Application course decide it a course with strong operability and practicality. Picture processing, animation design, demonstration system design and other contents can only be completed with related software which is not suitable for traditional paper teaching and exams [6]. Therefore, multimedia online teaching, network experimental environment and online test environment are the necessary hardware and software environment of the course. Online multimedia teaching software and system, online experimental and working platform and online test system are three significant tasks for reform of online teaching. Multimedia classes and labs connect students’ dormitory ends and other public ends and teaching material webs through campus LAN to construct a campus online teaching platform, and realize interactive teaching through distance online teaching, broadcasting teaching in computer room and teachers and students’ online dialogue and answering questions and so on. In addition, teaching discussion can also be done on EMAIL, QQ, WeChart and other public communication platforms, which construct a good teaching communication environment without any expense [7].

3.4 Reform of assessment and evaluation

Exams of the course includes written exam (close-book exam) and online exam. Final score is composed of three parts: daily performance score (30%), online exam score (30%) and final exam score (40%). Daily performance score includes: attendance, assignments, quizzes, online work, etc. Close-book exam mainly evaluates students’ understanding of basic concepts, theories and methods and operating status of relevant software. Online exam mainly evaluates actual application of software. Assignments and experimental designs are main ways of practice for students, and electronic file is the main form. Traditional paper work has not met requirements of the course, and paper-free and electronic solution is its trends. Today, multimedia material processing and design demands experimental platforms to provide PHOTOSHOP CS4-6,

FLASH CS4, AUTHORWARE 7.02 and other multimedia design software, and offer video design cases for students' reference and imitation. Based on the purpose of teaching experiment, it provides corresponding design software and basic multimedia materials, and asks students to learn necessary operating methods and make multimedia design documents and works which meet the experimental requirements through software and material processing. Students should be good at operating software, process materials fast and make appreciation-deserving design works. High requirements for practical and design ability make students devote enough time to the course, or their works cannot be perfect and they fail exams.

In order to avoid simplification of exams and standardization of answers, environment and contents of exams also need to be reformed. Except that some questions of basic theory have the same answers, other design questions demand students give different solutions by playing their own individuality. Students should add their personal information such as names to image processing and animation design, which permits students to cheat by copying files and avoids design files being destroyed by virus from U Disk at the same time. Exams are held through campus LAN and test documents are issued on online platform. The same or different computer rooms can issue different exam paper. Students submit exam documents to network server through network terminals. After that, students' exam documents on terminals are deleted automatically which does not affect follow-up exams.

4 Summary

Multimedia Technology and Application is an important compulsory course. As a key component of practical teaching, Course Design is in favor of developing students' practical ability and innovation ability. Research on teaching practice for many years indicates that the closer topics of Course Design to the requirements of multimedia technology from society, the more motivation students have. Teaching has a pressing need to improve students' social adaptive capability and tris hard to cultivate applied talents of multimedia design that society needs [8].

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References

1. Q.H. Shi, A.P. Wang Aiping, Educational Development Research, pp34-37, 21(2008)
2. G.Y. Qian, G. Wang, L.Q. Xu, China University

- Teaching, pp54-56, 9(2005)
3. S.Q. Sun, Y.A.Gu, Modern Education Management, pp72-75, 9(2012)
4. Y.X. Mao, Z.Z. Cang Zhizhi, Multimedia Technology and Application, pp12-25, (Beijing: The People's Posts and Telecommunications Press, 2011)
5. Y.Z. Zhong, Fundamentals and Applications of Multimedia Computer Technology, pp12-25, (Beijing: Higher Education Press, 2012)
6. B. Zhou, Journal of XiangNan University, pp82-85, 2(2016)
7. X. Huang, Computer Knowledge and Technology, pp5522-5523, 24,(2013)
8. B.H. Xue, Journal of Xiangnan University, pp116-120, 4(2016)