

Research on Interdisciplinary Teaching Model in the Context of Internet

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Abstract

Internet technology has become the trend of the times. The popularity of the Internet has made all kinds of resources exchange and spread to an unprecedented extent. Modern education has entered the Internet environment. At the same time, the diversified development of social economy and the complexity and comprehensiveness of the current problems make the goal of modern talent education gradually turn to the comprehensive higher talents which are adapted to the current economic and social development. This paper discusses the interdisciplinary teaching mode from the aspects of teaching characteristics, teaching reform and key problems, so that our teaching can effectively adapt to the new tasks and requirements in the context of Internet. Furthermore, it plays a guiding role in the establishment of new teaching tasks and talent training programs to meet the needs of modern society.

Keywords

Internet; interdisciplinary teaching; transportation major.

1. Introduction

With the improvement of Internet technology and the rapid development of knowledge network dissemination, the concept of "Internet+" has quickly integrated into all trades and professions. The popularity of the network environment has brought unprecedented development to shared teaching of all majors in universities. Internet technology provides a better communication platform for the construction of interdisciplinary disciplines, and also makes the construction of interdisciplinary teaching simpler. Setting up interdisciplinary courses through the Internet has gradually become an issue of great concern in the field of teaching. Interdisciplinary courses can better broaden students' horizons around teaching objectives by establishing courses with unified themes and interdisciplinary boundaries. Compared with the traditional single-direction teaching mode, this cross-disciplinary curriculum design form is worth learning and exploring.

In other countries, the research on "Internet+" and interdisciplinary subjects started earlier. Since 1940s, Harvard University has allowed undergraduate majors to be arbitrarily selected and exchanged. At the same time, they can also change their majors according to their preferences and choose interdisciplinary courses in more than 400 courses in eight major categories[1]. In the practice of interdisciplinary courses, MIT in the United States took the lead in offering interdisciplinary comprehensive courses in the field of Engineering education, aiming at broadening and enhancing the knowledge and technical level of engineering education talents. Duke University is committed to creating a multi-dimensional educational environment that enables students to grasp complex issues[2-3].

In China, the Internet and interdisciplinary teaching started relatively late. Qin Zunye and Dong Fanning proposed to integrate the Internet and the education industry by using the Internet platform and communication technology to create a new educational environment, that is, the "five-step discussion teaching mode" based on Internet technology, to optimize the ecological environment of classroom teaching and achieve the goal of improving the quality of classroom teaching[4-5]. Based on the teaching mode of subject experiment, the setting of experiment curriculum and experiment project, Xu Na, Wang Jun and Wan Tingting respectively put forward the interdisciplinary experimental teaching centering on the need of practical working skills, aiming at the professional orientation of economics, architecture and automobile[6-8].

It can be seen that the traditional undergraduate education in China is relatively over-specialized. Students know little about knowledge other than their major, which makes the undergraduate training of talents appear "too narrow adaptation" situation. This is inconsistent with the rapid development of social pluralism and networking. The purpose of this paper is to study the mode of talent education in Colleges and Universities under the "Internet" environment, to reform the traditional single professional talent training mode, and to explore new ways of interdisciplinary education by training comprehensive talents under the network environment and higher talents adapted to social development.

2. Teaching Characteristics in the "Internet Environment"

With the development of the Internet, the latest literature, materials and research results can be easily disseminated and shared through the network. Students and teachers can not only obtain resources from a large number of ways, but also easily search for the latest resources. At the same time, "Internet +" will bring great changes to classroom teaching, mode and means. The knowledge reserve and understanding that students possess will also pose new challenges to the traditional teaching mode to a large extent. Therefore, teaching in the Internet environment should be changed.

2.1. Expanding the Scope of Teachers

Expanding the scope of teachers means not only increasing the number of teachers and teams, but also requiring teachers to have a wider range of knowledge. Under the Internet environment, teaching is no longer the traditional classroom. With the emergence of network education and virtual classroom, students already have a lot of ways and means to learn knowledge. Even students know more about the curriculum than teachers and syllabus require. Therefore, besides lecturing on the platform, teachers should also have a classroom or a teaching team composed of experts in this field behind them to ensure that they can timely answer students' professional questions or related knowledge. Or behind the provision of virtual teaching videos, a virtual teaching service team composed of certain professionals, including system maintenance personnel, video editing production, website maintenance members, as well as virtual classroom assistants, after-school counseling and answering professionals.

2.2. Changing Students' Former Learning Styles

Through the network, students can acquire knowledge and cultivate interest in a much wider range than before. It is still difficult to arouse students' interest in learning by using the old teaching methods. At the same time, a wide range of interests and knowledge makes students free from the restraint of books and classes. Students are more willing to choose other ways to acquire knowledge that interest them. At this time, we need to introduce some new teaching methods and concepts in the classroom. For example, emphasizing individualized learning, paying more attention to the cultivation of ability rather than knowledge. Of course, if we can

learn from the "Internet +" technology, such as bringing virtual reality (VR) technology to the classroom, these advanced techniques will achieve excellent results.

2.3. Sharing of Teaching Resources

Modern teaching resources refer not only to the past physical resources, such as classrooms, textbooks and reference materials, but also to all physical and virtual resources covering the whole teaching process. These resources greatly enrich the breadth of teaching and directly match the needs of the new type of teaching classroom. With the wide application of the Internet, a large number of network teaching resources have emerged. From the more formal network quality courses in the past to the present, MOOCS, SPOC, micro courseware, micro-video, e-schoolbag, teaching platform, digital library, learning analysis system have become the derivatives of teaching resources[9]. Open access to resources allows students to easily share these virtual teaching resources even if they are thousands of miles apart. At the same time, through these teaching resources platform, students and students can share resources and communicate with each other; teachers and teachers can easily exchange teaching experience and experience; teachers and students can also ask, answer, test assignments and statistical analysis. All these will further promote the sharing of teaching resources.

2.4. Changes in Teaching Contents

With the rapid development of the Internet, the reserve of teaching knowledge has grown explosively. In traditional teaching, the era of relying on short classroom time to impart knowledge points is obviously not suitable for the development of the times. In the same course, there are more and more knowledge points, syllabus, forward courses and follow-up courses, as well as more and more elective subjects. Students are also facing higher and higher social employment requirements. At the same time, because students can easily, accurately and extensively access curriculum resources in the network. Therefore, modern teaching content, in the short classroom time, in addition to the essential points of knowledge, should pay more attention to guiding students' ability of autonomous learning and the spirit of exploration of autonomous thinking, we can consider more organization of students' seminars on teaching content, professional field study.

3. Major Innovations of Interdisciplinary Courses in the Internet Environment

3.1. Change the Traditional Single Professional Training Mode

Referring to "general education", we should pay more attention to the breadth of basic education besides the deep development of previous professional education. For some interdisciplinary courses, we often need to have several basic courses of different majors as support. Taking transportation as an example, most of the time in foreign countries are classified as civil and environmental engineering specialty. In China, some schools set it up with logistics management specialty, some with automobile machinery specialty, some with information engineering control, some with safety and environment, some with bridges and tunnels, etc. It can be seen that there are a large number of subjects that can be taught across disciplines. Under the Internet environment and the reality of the explosion of knowledge reserve, how to grasp the relationship between disciplines and educate "T" talents with both depth of expertise and breadth of interdisciplinary knowledge are the issues that should be paid attention to in modern teaching and training mode.

3.2. The Curriculum Should Be Reorganized

Today, with the rapid development of the Internet society, there are still some school syllabuses, which were formulated many years ago. Obviously, such curriculum design is often unreasonable at present. For example, it may be possible in the past to complete the study of

basic disciplines in only one year, but now there are a large number of Internet materials. Interdisciplinary disciplines require more basic knowledge reserve, and society needs new talents for all-round development. Therefore, increasing the number and teaching time of professional basic courses appropriately is more in line with the modern teaching mode under the Internet environment. In order to better guarantee the follow-up courses, especially for some interdisciplinary, interdisciplinary courses to lay a solid foundation for learning.

3.3. Implementing the Principle of "Thick Foundation, Wide Caliber and Strong Quality"

Because of the needs of society, the slogan of "thick foundation, wide caliber and strong quality" is often used in schools. However, many schools and colleges believe that simply relying on the increase of courses, allowing students to cross-disciplinary, cross-disciplinary course selection is the "thick foundation, wide caliber". First of all, most students do not have a deep understanding of the specialty. Selecting courses freely and interdisciplinary in many courses of the college or even the whole school may affect the study of the specialty courses. Secondly, too many courses and different scoring standards of each course will lead to the change of the purpose of students' choosing courses, from learning more extensive knowledge to getting better grades. Finally, because of the many courses chosen, the content of knowledge acquired by students is too scattered. Such interdisciplinary problems will still encounter difficulties in solving practical problems. Therefore, the principle of "thick foundation, wide caliber and strong quality" is not simply to set up interdisciplinary courses, but to have a supporting teaching organization. We can't open courses at will for the sake of "thick foundation"; we can't arbitrarily cross-disciplinary for the sake of "wide caliber". We must follow the basic teaching norms, formulate a sound training program, syllabus and teaching task book. Only on this basis can we truly implement the principle of "thick foundation, wide caliber and strong quality".

3.4. Teaching Methods Should Be Improved with the Characteristics of Modern Education

Educational methods should keep up with the times and change with the change of objects. At present, education pays attention to the combination of theory and practice and the integration of production and learning. Teachers of different majors, experts outside school or even some entrepreneurs should be considered to form education teams with students to guide students in a team mode. Such an educational team can ensure that teaching is scientific. The cross-specialty trained by teachers of various disciplines can be combined with practical learning while teaching theory. In addition, experts and professionals have a more in-depth understanding of the problem, with its academic perspective, can better clarify the intersection and differences between interdisciplinary fields, pointing out more in line with the characteristics of modern education learning methods for students.

3.5. Keep Abreast of The Frontiers of Disciplines and Seize Opportunities for Communication and Sharing.

The Internet society enables every teacher and student to have close contact with the cutting-edge technology and more opportunities for communication and sharing, which is difficult to achieve in the past teaching. These advanced science and technology may be subversive to an industry. For example, the technologies related to transportation are cloud computing, big data, artificial intelligence, VR, mobile flash payment and automatic driving. In these waves of science and technology, it is interdisciplinary with information and communication technology, computer intelligent technology and intelligent control technology. In order to make teaching content related to reality, it is necessary to keep abreast of cutting-edge science and technology, exchange and share resources across majors at all times, so as to join in the tremendous trend

of scientific and Technological Development and become a part of historical change rather than a passer-by passing by with advanced technology.

4. Key Problems to be Solved in Interdisciplinary Courses under the Internet Environment

The key problems to be solved are as follows:

- (1) Under the Internet environment, through collecting a large number of resources and integrating resources from the perspective of interdisciplinary, a scientific and reasonable curriculum syllabus for interdisciplinary courses is formulated.
- (2) Retraining teachers. Relying on Internet technology, we can actively organize the cooperation of teachers in different disciplines and exchange teachers in different schools and regions. It can also open up the communication between teachers and students, and explore a new method more suitable for modern teaching environment through the comprehensive integration of resources.
- (3) Compared with professional textbooks, there are fewer interdisciplinary textbooks on the market, and the formulation of standard system is not perfect. In order to meet the needs, it is necessary to organize multi-school and multi-professional teachers from the upper departments to arrange interdisciplinary textbooks.
- (4) Nowadays, the Internet has abundant resources, but the open network environment makes some resources uneven. Professional authorities should strengthen the supervision of the Internet and establish standardized network courses. Really realize the sharing of resources among teachers, schools and teachers and students.

5. Conclusion

"Internet+" is the main direction of social development in China. Interdisciplinary personnel training is an important trend in the current teaching reform. Internet and interdisciplinary are both necessary, and they complement each other. First of all, interdisciplinary teaching can meet the diversification of teaching. Internet provides convenience for interdisciplinary training mode. Secondly, the Internet enables the rapid dissemination and sharing of resources, providing a platform and advantages for interdisciplinary construction. Finally, in the long run, the goal of teaching is to cultivate students' ability to learn independently and solve practical problems. Therefore, it is necessary for schools to cultivate students' ability to solve complex multidisciplinary problems as well as to acquire more resources to solve practical problems on the Internet. Finally, the ability of employment and career transformation of college students will be strengthened.

References

- [1] Pu Shi, Chen Sai: University Spirit: Education is to make a person the best version of himself (China Citic Press, China 2017).
- [2] Armstrong and F. Faculty: Development Through Interdisciplinarity. Journal of General Education, Vol. 31 (1980) No.1, p.53-54.
- [3] Association of American College: Interdisciplinary Studies (In Reports from the Field. Washington, D.C. Association of American Colleges. American 1991).
- [4] Qin Zun Yue, Xu Hongzhi, Huang Yun and Cai Guomin. Reform and Practice of Seminar Teaching Mode in the "Internet +" Environment. Computer Education, Vol. 11 (2017) No.11, p.99-102.

- [5] Dong Fanming and Cheng Yun. Research on the Construction of Shared Teaching Resource Base of Management Specialty under Internet Environment. Journal of Liaoning Institute of Economic and Management Cadres, Vol.5 (2017) No.5, p.108-110.
- [6] Xu na. Exploration and Research on the Interdisciplinary Experimental Teaching Model of Economics and Management. China Management Informatization, Vol.20 (2017) No.3, p.255-257.
- [7] Wang Jun: Exploration of Interdisciplinary Application of Architectural Information Model Technology in Architectural Undergraduate Education, Papers Collection of 2007 National Architectural Digital Technology Teaching Seminar and DADA 2017 International Symposium on Digital Architecture (Nan Jing, China 2017), No.9, p.9-10.
- [8] Wan Tingting. Exploration of Interdisciplinary Innovative Talents Training Model Combining Auto Competition and Constructivism. Modernization of Education, Vol.4 (2017) No.43, p.11-12+17.
- [9] Qin Zun Yue, Xu Hongzhi, Huang Yun and Cai Guomin. Reform and Practice of Seminar Teaching Mode in the "Internet +" Environment. Computer Education, Vol. 11 (2017) No.11, p.99-102.