

Discussion on the Reform of Applied Undergraduate Teaching in the Digital Era

Rong-Quan Zhang¹, Jia-Qing Song¹, Jing Lei²

Office of Educational Administration, Taishan University, Tai'an 271000, China¹

School of Mathematics and Statistics, Taishan University, Tai'an 271000, China²

Abstract—Under the background of digitalization, application-oriented undergraduate colleges are facing many teaching reform problems, so it is of great value to build a digital teaching platform and promote the reform of applied undergraduate teaching. This paper discusses the reform of the teaching content, scheme and method of applied undergraduate in the digital era, analyzes the teaching mode in the digital age, and puts forward the teaching reform strategy of applied undergraduate in the digital age.

Index Terms—Applied undergraduate; Digital age; Pedagogical reform; Universities

I. INTRODUCTION

In the digital era, the rapid development of Internet technology has led to the reform of application-oriented undergraduate education and made the choice of undergraduate teaching mode more diversified. In addition, applied undergraduate education breaks the dominant position of teachers in the teaching system and fully highlights the dominant position of students in teaching practice. In the digital age, various new teaching models have been continuously derived, laying the foundation for the reform of undergraduate education. This paper focuses on the teaching reform strategies of applied undergraduate education in the digital era to improve the quality of undergraduate education.

II. THE BACKGROUND

In the digital age, many teaching pathways have been generated, transforming people's learning paths. In recent years, Internet technology has fully covered the study and life of college students, and is affected by the strong interaction of the Internet and the strong learning ability of college students, resulting in college students being both Internet builders and beneficiaries, that is, they can also provide Internet information during the acquisition of Internet information. In the digital era, network technology and teaching practice have been perfectly integrated, and at the same time the primary and secondary status between teachers and students has been transformed, that is, students are the main body of applied undergraduate teaching, and teachers are the guides of undergraduate teaching, and with the continuous maturity of Internet technology, the goal of independent learning and cooperative learning of college

students has been achieved, and at the same time a number of choices have been provided for undergraduate teaching, so that students can fully acquire knowledge and improve the quality of teaching. In recent years, Internet technology has gradually penetrated into the reform of undergraduate teaching, digital education has gradually matured, and online teaching platforms have gradually opened, which has further promoted the reform of application-oriented undergraduate teaching.

However, applied undergraduates still face a series of problems during the actual teaching reform, which are manifested as follows: low information level, imperfect infrastructure, and incomplete coverage of wireless networks; Poor integrity of information system, imperfect function of information system, etc.; The software center has not yet been created, and it is difficult for teachers and students to choose the appropriate teaching software according to their own needs; Learning terminals such as mobile phones and tablets are difficult to connect with various application platforms. In the digital era, in order to make full use of various learning resources, it is necessary to gradually enrich and share large-scale online education platforms to lay a technical foundation for promoting the reform of application-oriented undergraduate teaching. However, there are differences in teaching resources on different network platforms, and in order to promote the teaching reform of colleges and universities, it is necessary to ensure the synchronization of teaching resources and curriculum resources. In addition, the ability and informatization quality of applied undergraduate teachers directly affect the concept of teaching reform, so during undergraduate teaching practice, if you want to implement the digital teaching reform strategy, you need to break the balance of the traditional education environment and prepare for teaching reform.

III. THE PATH OF TEACHING REFORM IS DISCUSSED

(1) Teaching content

During the optimization of curriculum design, application-oriented undergraduate colleges need to make full use of the convenient conditions of the network and integrate the resources of different undergraduate colleges to break the teaching barriers between application-oriented undergraduate colleges and realize the sharing of high-quality resources among various universities, so as to give full play to the advantages of online teaching in the digital era, avoid



scattered or repetitive construction courses, and create an evaluation system based on Internet technology. In addition, application-oriented undergraduate colleges need to clarify the knowledge structure, talent types and skill requirements, adjust the teaching content according to the needs of modern society, and then highlight the application and epochal characteristics of each subject system. By streamlining teaching content and adjusting the proportion of courses, application-oriented undergraduate colleges can improve the relevance of theoretical knowledge and practical courses. At the same time, during the period of innovative practical teaching, application-oriented undergraduate colleges make full use of information technology during the period of theoretical and practical teaching, and can give full play to the advantages of informatization and digital resources. During the actual practical teaching period of application-oriented undergraduate colleges, it is mainly composed of basic, professional, innovative and other links, among which the basic module learning includes professional theoretical knowledge, course experiments, etc., which can improve students' ability to solve practical problems, stimulate students' understanding and internalize learning skills; Professional practice includes social practice, production practice, etc.; Innovation practice refers to innovation and entrepreneurship activities and various innovation competitions, etc., focusing on improving students' innovation ability.

(2) Teaching programs

The reform of the teaching plan should first change the teaching philosophy, and then impart relevant teaching knowledge to students and provide students with problem-solving strategies. In order to meet the needs of economic construction, all application-oriented undergraduate colleges need to guide students to structure professional knowledge to enhance their innovation capabilities. In the digital era, undergraduate teachers need to take the initiative to build the framework of the user concept system before teaching, and guide students to independently discuss and collaborate to build a professional knowledge system. In recent years, emerging online teaching methods such as online classroom and flipped classroom have been emerging, which can integrate online classroom teaching. During the integration of Internet technology into classroom teaching, high-quality teaching resources can be shared through the network platform to meet students' learning needs. Combined with the analysis of students' cognitive characteristics, reform the classroom organization form and teaching plan, create a vivid teaching scenario, promote the gradual transition of application-oriented undergraduate classrooms from closed to open, and then improve the teaching efficiency of undergraduate colleges.

(3) Teaching methods

Outcome-Based Education OBE (Outcome-Based Education) is a goal-oriented education based on the structural model of organizing, implementing and evaluating education centered on the goals achieved by expected learning, and implements it around the four steps of "defining learning objectives → achieving learning outcomes →

evaluating learning outcomes → using learning outcomes". OBE education emphasizes the comprehensive and coordinated development of knowledge, ability and quality, and the first task is to formulate curriculum learning objectives, and the course teaching content, teaching methods, assessment and evaluation process must be based on course learning objectives. In the traditional teaching process, the teaching mode of teachers talking about students' doing is mainly adopted, the teaching objectives are mainly to verify theoretical knowledge and master experimental skills, and the curriculum design lacks practical project training combined with engineering practice, resulting in students' learning goals are not clear enough, the initiative is not high, and the comprehensive application ability is not strong. How to make students clear about their learning objectives and change from passive learning to active learning is a key issue that needs to be solved in the reform of applied curriculum.

The applied curriculum reform based on the OBE concept is guided by learning objectives, adopts the flipped classroom teaching mode, takes engineering practice projects as the carrier, drives the learning of theoretical knowledge through online and offline, virtual and real methods, masters practical skills, and builds a three-dimensional progressive practical teaching system, which integrates course teaching and engineering application, and greatly strengthens students' vocational ability. The specific content mainly includes the following four aspects:

(i) Introduce course project cases. Through school-enterprise cooperation, engineering practice projects are introduced and engineering application cases are developed, which involve multiple knowledge points of the course, and the knowledge points are cross-integrated with each other, so that the course teaching realizes the transformation from single knowledge and skill learning to comprehensive quality ability training.

(ii) Adjust the teaching mode of the course. Rationally use the high-quality teaching resources of the Internet, strengthen the interaction between teachers and students through flipped classrooms with the help of online teaching platforms, cultivate students' interest in learning, and establish a "buffet-style" learning mode.

(iii) Reform curriculum teaching methods. Through the teaching process of "online and offline independent learning → simulation design → combined with experimental environment → extracurricular practical training", students can master professional skills, cultivate innovation ability, and improve comprehensive ability literacy.

(iv) Innovate the curriculum assessment mechanism. Reform the assessment mechanism in the course teaching process, strengthen the process assessment, cultivate students' comprehensive application ability through project reports, teacher and student comments, achievement displays, etc., and add incentives to improve students' participation in course learning.

(4) Teaching evaluation

In the digital era, the applied undergraduate teaching concept, teaching content, teaching plan, teaching method,

etc. have been reformed, so the evaluation mechanism of students should also be reformed. Based on the analysis of student differences, it is necessary to affirm the independent learning results and evaluate the reform effect of applied undergraduate teaching programs based on Internet technology. During the period of application-oriented undergraduate teaching, it is necessary to pay attention to the application and composite characteristics of relevant knowledge, and pay attention to the prominence of indicators such as foundation, characteristics, technology, and application. The use of cloud computing, big data, etc. to build an evaluation system, so that student evaluation can be transferred from the roll to the network platform, and big data can be accurately analyzed, so as to improve students' learning ability and enhance students' comprehensive literacy. [9] examined the development and refinement of possible mathematical models for the intellectual system of career guidance. Mathematical modeling of knowledge expression in the career guidance system, Combined method of eliminating uncertainties, Chris-Naylor method in the expert information system of career guidance, Shortliff and Buchanan model in the expert information system of career guidance and DempsterSchafer in the expert information system of career guidance method has been studied. The algorithms of the above methods have been developed. The set of hypotheses in the expert system is the basic structure of the system that determines the set of possible decisions of the expert system. This set, which is crucial in decision-making, should be sufficiently complete to describe all the possible consequences of situations that arise in the subject area. Therefore, it is important to improve the mathematical models of the intellectual system of career guidance. [10] discussed about specific Policy document which ensures of which the teaching, learning in addition to assessment methods are upwards to the amount of typically the course and are ideal to the attainment involving objectives and intended understanding outcomes of the program and the course. The particular policy requires that school members use recent in addition to variety of teaching, mastering methods and assessment methods. Higher Quality Accredited Institutions will continue to further more improve the standard involving teaching and learning via recognition, sharing and moving of good practices to be able to inspire the learners to be able to achieve their potentials throughout a multicultural environment in addition to in turn, improve accomplishment, retention and learners pleasure.

The teaching reform of applied courses strengthens the process of assessment, and the specific assessment and evaluation methods: the results of practical training courses are composed of two parts: individual assessment and team assessment, and individual assessment results account for 30%, including: usual check-in (accounting for 5%), online independent learning (accounting for 5%), classroom questions (accounting for 10%), online testing (accounting for 10%), and recording results with the help of teaching platforms; Team assessment scores account for 70%, based on practical project results. In order to cultivate a sense of teamwork and improve students' enthusiasm, the team

assessment results are the results of each team member and attract students to participate in the implementation of the entire project.

IV. THE ANALYSIS OF TEACHING MODE IN THE DIGITAL ERA

(1) Multimedia teaching

The multimedia teaching mode requires college teachers to have an information technology foundation, and make full use of PPT combined with multimedia to carry out teaching when teaching. In the multimedia teaching mode, large-screen projection gradually replaces board books, and online teaching resources reduce the pressure of teachers' lesson preparation. At the same time, the video and audio combination mode can vividly and vividly show students relevant knowledge and stimulate students' interest.

(2) Micro-course teaching

Micro-lesson teaching refers to the use of short videos to focus on a certain knowledge point, and the general duration of micro-lessons is only a few minutes. After watching the micro-course course, if students still do not grasp this knowledge point, they can watch it repeatedly to check for gaps.

(3) MOOC teaching

MOOC refers to online open courses, which contain rich teaching information and can meet the online learning needs of college students. MOOCs have a large base in applied teaching, and students can learn what they love and broaden their knowledge through MOOCs.

(4) Live teaching

The live teaching mode can answer students' doubts online and is more interactive. In addition, in the live teaching mode, students can communicate with front-line teachers online, which is conducive to students' access to high-quality teaching resources.

V. THE TEACHING REFORM STRATEGY OF APPLIED UNDERGRADUATE IN THE DIGITAL ERA

(1) Actively introduce new teaching models

Application-oriented undergraduate colleges can combine their own actual conditions, apply micro-courses, MOOCs and other modes in teaching practice, as well as new media equipment, and use new teaching models to enhance students' cognition and understanding of the knowledge they have learned. In addition, during the teaching reform of application-oriented undergraduate colleges, it is necessary to pay full attention to the convenience of new media, and carry out in-depth discussions on topics after class, so as to realize real-time communication between teachers and students, extend classroom teaching to after-class, and then improve teaching results.

(2) Build professional Internet platforms

In order to update teaching resources and improve teaching quality, it is necessary to build a professional Internet platform and update teaching resources in a timely manner. In addition, undergraduate colleges should make full use of network information technology, create a network library platform, and regularly update cutting-edge information to

lay the foundation for the reform of teaching resources in colleges and universities.

(3) Do a good job in school-enterprise cooperation

Application-oriented undergraduate universities need to pay attention to the combination of industry and education, and encourage enterprises and research institutes to participate in the construction and planning of university training bases. Ensure that the cultivated talents meet the needs of society, create a good operating mechanism with enterprises, and attach importance to the scale, quantity and stability of industry-university enterprises. Colleges and universities provide students with off-campus internship opportunities, which can enable students to understand the future work process, clarify the needs of enterprises for talents, exercise students' practical ability and application ability, and help students adapt to their positions faster. During the period when application-oriented undergraduate colleges lead students to study in enterprises, they need to fully consider the society's demand for talents in their majors, ensure that students can understand the design, development and implementation process of enterprises, so as to assist students to adapt to the working environment of enterprises, and then enhance the competitiveness of application-oriented undergraduate colleges. College students through teaching practice inside and outside the school are conducive to cultivating students' professional quality, and can also reduce the cost of enterprise training, thereby reducing the waste of human and material resources during college teaching.

(4) Train teachers

In the context of the digital era, if colleges and universities want to improve the efficiency and quality of reform, they must ensure that teachers have high-level information technology and master modern teaching mechanisms. Vigorously train the teaching team so that teachers have both theoretical foundation and practical experience. Actively build a "dual-quality" teaching team, and enhance teaching standards through programs to improve teachers' academic level and cultivate their theoretical quality. Teachers need to pay attention to academic trends at home and abroad, master the latest teaching strategies, build a communication and cooperation platform between teachers and enterprises, encourage college teachers to go deep into various enterprises to learn and exercise, and lead students to participate in enterprise work practice, so as to assist students to apply theoretical knowledge to teaching practice. At the same time, application-oriented undergraduate colleges need to carry out online teaching training, so that teachers can proficiently use data analysis software and network processing platforms to independently complete MOOC production and micro-video production. In addition, colleges and universities should also guide teachers to reform their teaching concepts so that teachers have "digital" thinking. Regularly carry out micro-lesson teaching competitions, online classroom teaching and other activities, promote teachers' in-depth understanding and exploration of information teaching programs, and guide teachers to organically integrate classroom teaching with Internet technology. Teachers should also guide students to build knowledge networks independently and quickly adapt

to digital classrooms to implement multi-dimensional teaching, so as to improve the teaching efficiency of application-oriented undergraduate colleges.

VI. CONCLUDING REMARKS

The digital era has opened a new chapter in online teaching and laid a technical foundation for application-oriented undergraduate teaching. During the teaching work of application-oriented undergraduate colleges, they should pay full attention to the advantages of the Internet era, and actively reform and optimize their own educational concepts to improve the quality of undergraduate teaching. The construction of application-oriented courses is the basic way for application-oriented colleges and universities to achieve the goal of talent training, and it is also the core content of teaching reform, which is related to the quality of talent training and is closely related to the long-term development of colleges and universities. Through flipped classrooms, online and offline, virtual and real methods are used to carry out teaching. Introduce teaching cases of engineering practice projects, create a three-dimensional progressive practical teaching system, effectively improve students' professional quality and ability, lay the foundation for students' career development, and also provide useful reference and reference for the construction of application-oriented courses in other universities. In the digital era, colleges and universities should balance the relationship between offline teaching and Internet technology, and actively promote the reform of application-oriented undergraduate teaching to cultivate comprehensive talents in line with the development of the times.

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Rong-Quan Zhang received the Master of Education in English major from Shandong Normal University in 2009. He is an experimenter at Taishan University. His research interests include educational administration, teaching management. Email: 492449131@qq.com.

Jia-Qing Song received the Bachelor from Shanghai University of International Business and Economics in 1991. He is an experimenter at Taishan University. His research interests include educational administration, teaching management. Email: jiaqing_song@126.com.

Jing Lei (corresponding author) received the B.S., M.S., and Ph.D. degrees from Ocean University of China, in 2003, 2007, and 2010, respectively. She is a professor at Taishan University. Her research interests include educational administration, teaching management. Email: elizabethia@126.com.