Research on Informationized Teaching Model of Professional Courses in Higher Vocational Colleges under the "Internet +" Environment

Miaomiao Yang\textsuperscript{1,*} and Chao Zhang\textsuperscript{2}

\textsuperscript{1}Department of Industrial Engineering, Zhuhai College of Jilin University, Zhuhai, China
\textsuperscript{2}Department of Vehicle Engineering, Zhuhai College of Jilin University, Zhuhai, China

*Corresponding author. Email: 284722506@qq.com

Abstract. With the promotion of information technology, the Internet has been integrated into the education industry, which has profoundly changed both the teaching methods of teachers and the learning methods of students. On the basis of analyzing the current informational teaching mode of professional courses in higher vocational colleges in the context of "Internet +" era, this paper makes an analysis on making full use of modern information means from two angles, teachers and students. Based on the analysis of the author's teaching practice, this paper summarizes the experience through preliminary practice and its application, extracts the soul of reform and innovation through case law, and lays a foundation for cultivating a new generation of high-skilled and innovative talents.

Keywords: informatization, teaching mode, colleges and universities, Internet +, professional courses.

1. Introduction

"Internet +" is a concept with localization in China. This formulation was first proposed by Chinese Internet companies, and then adopted by the Chinese government in 2015. The essence is "Internet + Industry". Integration and development.

Teaching is an important function in colleges and universities. In actual teaching, teacher's teaching and student's learning are the two basic links of teaching. Therefore, to explore the teaching problem, we should start with two aspects of teacher's "teaching" and students' "learning". Searching for the topic of "Internet + Informatization Teaching" through CNKI's literature analysis method, 166 papers with similar records can be found. The papers were distributed from September 2015 to June 2019. Among them, 121 are about how to improve the teaching ability of teachers in the Internet environment, 12 are about the construction of teaching platforms, 18 are about the information-based teaching model as the theme, and the other is about the teaching reform and training plan of a course. Reform, or the application of information technology. Although there are related researches on informatization teaching mode, there are few researches on informatization from the perspective of teachers and students. This article uses this as a starting point for research.
2. Problems faced by colleges' informatization teaching model

On February 28, 2019, China Internet Network Information Center (CNNIC) released the 43rd Statistical Report on Internet Development in China. The report shows that as of December 2018, the scale of Chinese Internet users was 829 million, of which mobile phone Internet users accounted for 98.6% and the Internet penetration rate reached 59.6%, as shown below. Figure 1 shows the scale of Internet users and Internet penetration rate. Figure 2 below shows the scale of mobile phone users and their proportion in the Internet users. Among them, college students are the main force of Internet users.

As the application of computer network technology, the Internet is mainly characterized by information resource sharing, timely communication, and fast and wide spread. This feature has greatly facilitated people's access to information, and has also brought about major changes in teaching and learning in the education industry. At present, students no longer rely on traditional classrooms and books for acquiring knowledge. Now, channels for acquiring knowledge are diversified, such as classrooms, books, and the Internet. Moreover, the weight of knowledge acquired by the Internet will increase. Similarly, there are various forms of information representation, such as text, video, animation, various network courseware, and electronic web pages. This kind of change instructs students to change from passively receiving knowledge learners in the classroom to active and passive learners of knowledge. This role change requires teachers and students to change their minds to adapt to and accept new knowledge learning models.

![Figure 1. Netizen scale and Internet penetration.](image)

2.1. Single teaching organization form and insufficient information teaching equipment

At present, informatization teaching has become the norm in major universities. Basic national college teachers use desktop computers and electronic whiteboards combined with blackboard writing for teaching. The main courseware and related materials are displayed to students by sharing the hard drives with teachers. In general, there are fewer universities that use advanced technologies such as mobile terminals, artificial intelligence, VR, and 3D printing, and the information-based teaching method is simple.

With the development of the times, China has entered the era of information technology. Therefore, in the process of promoting the development of education information technology, universities should no longer adopt traditional teaching methods and make full use of information technology equipment. At present, although most college teachers use multimedia to teach, most teachers still lack network equipment and cannot realize the recording and broadcasting of classroom courses, online videos, timely watching of courses, timely submission and timely review of online question bank, etc.
2.2. Teacher-student interaction is weak and inefficient
The traditional teaching mode is mainly for teachers to teach in the classroom. Sharing resources after class belongs to a static sharing mode, and the teaching mode under the "Internet +" environment can be established as a social interaction mode. In this mode, teachers and students can be involved in the course development process, and teachers and students can achieve vertical and horizontal online communication, thereby gradually building a course into a large open online course (MOOC).

2.3. Lack of student learning autonomy
Relatively speaking, students in vocational colleges have poor learning initiative and lack of solid theoretical knowledge. However, in order to develop their careers, higher vocational colleges pay close attention to the development of professional courses and invest more in teachers and teaching facilities. The purpose of implementing professional courses is to allow students to master all kinds of knowledge needed for future employment. If only the teacher's classroom indoctrination teaching, this teaching method is less intuitive. For students in higher vocational colleges, due to their self-control, their learning abilities are relatively weak, and their learning effects will not be too good. And after class, because people are inert, students in higher vocational colleges are relatively less motivated, so they need some motivating, coercive, and more efficient ways to motivate students to learn and improve their learning interest and efficiency.

3. Exploration and research on the informatization teaching mode of college courses based on "Internet +"

3.1. Exploration and study of classroom teaching mode

3.1.1. Project introduction. The teaching of professional courses can be based on a certain project and a case to carry out teaching design based on the theory. In the course of teaching, the teaching form of flipping course is used to take the practice position as the starting point, and the practical link is integrated into the classroom teaching, so that students have practical experience as far as possible, so as to deepen the understanding and application of knowledge.

3.1.2. VR introductory teaching. We can reform the supply side of higher education, carry out the MOOC revolution, and carry out reforms in the fragmentation of the supply side, the content is king, personalized customization, and the transformation of network connection models. For example, Khan Academy, a one-person global college, uses the Internet and artificial intelligence algorithms to create a new education and teaching method of interactive discussion in class, answering student questions, and extra-curricular video learning. + Everything for free "feature.

At the same time, make full use of VR technology to integrate virtual reality and classroom teaching to cultivate students' creative thinking. Especially for professional courses, the relevant
scenes encountered in actual companies are simulated with VR technology, giving students a sense of
immersiveness, which helps to improve students' actual feelings about actual companies, thereby
improving students' awareness of exploration, hands-on, and brain ability. The use of VR technology
in training courses can not only ensure the safety of students participating in training, but also save
time costs for students and teachers, and ensure that relevant teaching content in various industries,
departments, and workshops can bring students a more realistic experience. Thereby deepening the
mastery, interest and application ability of knowledge.

3.1.3. Situational instruction. Dewey, an American educator, believes that a situation is an
environment that can trigger the subject's emotional experience. Teaching always develops in a
situation. The situation is different from the traditional teaching theory environment. The situation is
more a kind of emotional environment with "temperature" in which people participate. Teaching
situational resources do not require us to deliberately "manufacture", but advocate teachers and
students to affectionately integrate and discover and capture in time, and this can be turned into a
positive factor of teaching. Therefore, teachers should be good at using the characteristics of the
curriculum, the characteristics of the students, and different contexts to use online resources to change
the teaching method in a timely manner. Only when the professor's teaching is effectively combined
with the situation at the time can real effective teaching be achieved, ignoring any aspect of it, then the
teaching becomes the teacher's "individual monologue", "or linear operation"; or the teaching changes
Become a deviation from the intended goal or "anything works."

3.1.4. Artificial intelligence introduced teaching. With the great success of machine learning
algorithms represented by deep learning in the fields of machine vision and speech recognition, and
the provision of abundant data resources such as cloud computing and big data, artificial intelligence
has entered an unprecedented period of rapid development, and it has profoundly changed all walks of
life. In the future, it is expected to introduce artificial intelligence educational robots, teaching
platforms, teaching software, teaching tools, intelligent virtual assistants, etc. into college teaching. On
the one hand, the teachers can build intelligent teaching modes in teaching methods, and conduct
specific investigations from intelligent lesson preparation before class, precise teaching during the
lesson, and intelligent question answering and counseling after the lesson. On the other hand, the way
in which artificial intelligence is learned by students-intelligent learning can be developed, such as
analyzing the development process of learning, the connotation of intelligent learning, and learning
from adaptive preview new knowledge, intelligent interactive learning, and intelligent accompanying
exercises. And intelligently guided deep learning. For students, artificial intelligence is used to realize
personalized learning and promote learning performance. At the same time, based on the individual
characteristics such as learning interests and abilities of students, it is recommended to adapt the
learning resources of the student to improve learning efficiency. For teachers, through artificial
intelligence, they can help teachers master the overall situation of teaching, obtain timely teaching
feedback, and analyze students' learning performance to predict student performance; identify students
with learning difficulties in time, implement teaching intervention, and reflect on teaching Methods to
discover learning patterns.

3.2. Exploration and study of assignment and correction modes
Homework, as one of the main contents of a student's extracurricular learning, is the content that most
teachers and students need to contact almost every day. According to statistics, student homework
time accounts for about 1/3 or more of the student's study time. Similarly, homework is also the job
that spends the most time of teachers, and homework often becomes whether students like a certain
subject, a certain person An important basis for teachers. Traditional classroom teachers assign
homework and students complete after class. It is impossible to avoid plagiarism. Therefore, teachers
cannot truly understand the actual knowledge of students. And using the information-based homework
assignment and correction mode to complete the test online, the teacher can timely understand the
student's knowledge grasp based on the online data feedback, so that most students' error-prone knowledge points can be explained in detail and timely remedied. For students in vocational colleges, this is undoubtedly more effective.

3.2.1. Papers, reports and essays. Course teaching can arrange online assignments such as essays, reports, and essays, so that students learn the basic methods and processes of scientific research, which is conducive to improving students 'learning ability and thinking ability, and to improve the development of students' comprehensive ability. As shown in Table 1.

Table 1. Examples of writing assignments.

<table>
<thead>
<tr>
<th>Writing assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition: Discuss the question in the classroom: &quot;Is Polanyi's opinion correct?&quot; Complete the 4-6 pages of the dissertation. Need to present a clear personal point of view and explain why.</td>
</tr>
<tr>
<td>Research Report: Write a 10-12 page research report on one of the two propositions provided under W. 1. Write any literature review report on the history of European economic development. The content of the topic includes the views of economists and historians, and analyzes the common points and contradictions of the same topic in the elaboration of economics and history. (It is recommended to choose this proposition). 2. Write original research reports in combination with original materials. Students who choose this proposition need to perform a complete history study. If you choose to send a proposition, you need to prepare a lot of time to collect and organize the original material. Due to the lack of relevant original materials, research and analysis can be carried out around a certain point. The file list below provides some of the sources of raw material available for reference. Source: European Economic History Curriculum for Wabash College</td>
</tr>
</tbody>
</table>

3.2.2. Reading assignments. Teachers can use online resources to provide video files, references, reference books, related websites, etc. that they need to read, and then let students submit reading reports online. Students need to summarize reading content and their own gains in the reading report and propose relevant information. view. For higher vocational colleges, in order to improve the success rate of students while ensuring the quality of teaching, a certain amount of reading assignments can be used as one of the indicators for assessing students' ordinary performance. As shown in Table 2.

3.2.3. Course design assignments. In China, many science and engineering majors have set course design assignments for related professional courses. In fact, liberal arts majors can also set course design assignments, such as project design or related research reports, when time permits, and require students to use information. The method of research is to use big data to research, analyze and collect relevant data, conduct questionnaire surveys, street interviews and other activities to write survey reports, as shown in Table 3.

3.2.4. Test paper. Test paper assignments are mainly the type of final and mid-term exam assignments that require a large amount of material and human resources, as well as a large amount of paper, and storage costs. At present, the electronicization of examination papers in colleges and universities mainly involves related computer-related courses. In the future, it is expected that electronic examinations will be implemented in the examination papers of each course, which will avoid plagiarism and save human and material resources. For example, for a professional course, design and implement an online homework and examination system, the teacher uploads the question bank and related answers, students can use this platform to conduct online training on the content of each chapter of the course, the system can form chapter homework according to the teacher's requirements, and the system Automatic test papers, students log in to complete the test, the end of the test can be automatically reviewed by the system to give grades, subjective questions can be reviewed by the teacher to give grades and detailed comments to let students know the wrong point, and the system can set frequently used comments Or the answer template is convenient for the teacher to operate. After that, the teacher can submit the correction information to the system database for
storage, and the students can view the teacher's correction comments. At the same time, when the teacher explains, the system can also prompt questions or steps that are easy to make mistakes, and use dynamic means to conduct man-machine communication. This not only achieves paperless office, but also saves time and costs for teachers and students.

Table 2. Reading assignments.

| Read and watch the web literature and related movies available in the list of files below (Uploaded to a file server or online website), provide online reading, |
| You can also download a PDF file in the corresponding format. |
| All are good: http://www.iqiyi.com/a_19rrgxdwal.html?vfm=2008_aldbd |
| Wandering Earth: https://www.iqiyi.com/v_19rrfe142o.html |

Table 3. Course design case.

| "Production Operation Management" Course Design Guide |
| I. Purpose and requirements of course design |
| 1. Purpose of course design |
| After completing the professional course of "Production Operation Management", students will design the course of production operation management. Through the training of curriculum design, make students further master |
| Hold the professional knowledge learned, cultivate students' ability to analyze and solve problems independently, and be familiar with and master the method of production planning and production operation planning of enterprises And steps. |
| 2. Course design requirements |
| According to the materials provided, analyze, calculate and design according to the design task requirements, and complete a complete course design report independently within two weeks. Specific requirements: |
| (1) Analyze all kinds of original data; |
| (2) Grasp the calculation methods and steps of the relevant major volume standards; |
| (3) Grasp the production method and steps of the production plan; |
| (4) Master the method and procedure of production operation plan preparation; |
| (5) Re-arrange the equipment by using the to-table test method of equipment plane layout; |
| (6) Master the material requirements planning-MRP preparation method; |
| (7) Use network planning technology to prepare production technology preparation plan; |
| (8) Use PERT for time-resource optimization; |
| Contents of Curriculum Design: Complete the corresponding course design report according to the requirements of the course design task book. |

3.3. Exploration of reference resource model

3.3.1. Micro lesson. Micro-learning is a short, complete teaching form that uses streaming media as a carrier to show a certain knowledge point or teaching link. The purpose is to allow students to carry out relevant learning and supplement knowledge according to their needs. The advantage is that learners can be targeted, fully allocate their time, and obtain relevant knowledge in a timely and effective manner. Micro-classes generally record about 10 minutes of video on knowledge points. Under the premise of the relevant teaching teacher setting up a course group, upload the micro-class videos to the pre-established Mu class website for students' reference. Then you can also make a multiple choice pop-up window for students to choose after the micro-learning preview, as a statistical indicator of the students' assessment of this knowledge point. Students can use the micro-lecture to preview the course in advance, or use the micro-lecture to unclear what is not understood in the classroom, or to review the exam preparation. The use of the micro-lecture is discussed before, during, and after the lesson.

Before class, students can use micro-learning to preview and master the learning knowledge points in time, thus greatly improving learning efficiency. The design of the content of the micro-lecture should be combined with the important knowledge points of the chapter, combined with actual cases.
and new cases, and one or two multiple choice questions can be designed after the micro-lecture video for students to solve the problem. Then the teacher can make a preliminary understanding of the degree of grasp of students' knowledge points based on the results of statistics.

During the lesson, teachers focused on the results of statistics to conduct normal teaching work in a targeted and focused manner, and students communicated with the teachers in a timely manner based on their doubts and solved them in a timely manner. Then the teacher can provide extended explanations of relevant content in the classroom, relevant lectures of relevant experts and professors, thereby saving teaching time and deepening the understanding of knowledge. Students can explore, apply, and design related knowledge points or problem solving.

After the lesson, teachers and students can feedback relevant opinions in time according to the pre-class and classroom learning situation, and then the teacher adjusts the form and content of the micro-lecture according to the feedback results, and adjusts the teaching content and method of the classroom. In addition, after class, students can review relevant knowledge points at any time based on micro-classes, and can also communicate with teachers in a timely manner through electronic related channels. In particular, most colleges and universities in the country are open to teaching, and can communicate in a timely manner through information channels.

3.3.2. Related literature, documents, cases, exercise library, etc.

Before the instructor starts teaching, the syllabus and teaching plan should be uploaded to the online network platform. Resources such as relevant chapters ppt, references, videos, related reference websites, chapter exercises, general exercise library and answers are also uploaded to the website in a timely manner. And updated in a timely manner. For class discussion work, you can ask questions / responses outside the class or answer questions on the spot. Question answering methods can be online question answering, network communication, telephone and other communication tools. Online Q & A can answer questions in real time, or you can reply collectively or individually at a later time, and use artificial intelligence to reply to conventional questions to save teachers and students time and improve efficiency.

3.4. Research and analysis of students' learning style

The "Education Informatization 2.0 Action Plan" issued by the Ministry of Education in 2018 clearly stated that we must actively promote "Internet + education" and establish a learning society that "everyone learns, can learn anywhere, and can always learn". In the "Internet +" environment, students can receive knowledge in a variety of ways, such as online classrooms, traditional classrooms, various network resources, mobile terminals, physical libraries, laboratories and other channels, so they are taught as a knowledge Teachers, teachers strive to build a broad enough knowledge transmission method, the content is deep enough to meet the requirements of different learners.

4. Conclusion

In the "Internet +" environment, the development of information technology provides more solutions for efficient work in education. The existing teaching method is relatively simple, which is not conducive to stimulating students' enthusiasm for learning. At the same time, due to the large number of Chinese students, the teacher resources are relatively weak. For teachers, there is generally a large workload pressure. In order to enrich the teaching mode and improve the work and learning efficiency of teachers and students, this article discusses the update of teaching mode from the perspectives of teacher's teaching and student's learning, so that I hope to provide some insights on Chinese school education, which has certain practical significance.

References

[10] Du Hong, (2019). Reform of Informatization Teaching Mode in Higher Vocational Colleges under the Background of "Internet +", Taking the Course of "Graphic and Image Processing" as an Example, Think Tank Times, pp. 252-254.