Innovation in Computer Application Courses in Higher Vocational Education in the Context of Big Data

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Abstract. In the context of the current big data era, the conventional classroom teaching is inadequate for the demand of computer application courses in higher vocational education. The way to reform the teaching mode, teaching method and teaching resources, and to integrate big data technology into computer application course teaching is explored, in order to train and educate talents at the demand of the developing times.

Keywords: Computer Application Course Teaching, Big Data, Higher Vocational Education, Teaching Reform

Nowadays, big data related technologies are affecting all areas of our society. Higher vocational education needs constant innovation and reform, and educators are constantly exploring how to bring out the vitality of the traditional education in current times. The individual needs of college students cannot be satisfied with the conventional teaching based on classroom instruction. The utilization of big data related technologies into classroom teaching can effectively change our teaching methods and integrate our teaching resources. Therefore, the teaching effect is improved and talents are cultivated and educated at the demand of the present society.

1 Influences of the Utilization of Big Data Related Technologies on Computer Application Teaching

The utilization of big data related technologies has a great influence on computer application teaching.[1] Teachers can use a variety of online teaching platforms for auxiliary teaching. The use of teaching platforms can help teachers make a comprehensive understanding of students' learning effect and situation, so as to strengthen teaching, management, supervision and other work at the same time.[2] The upcoming of big data era is an opportunity to education and teaching, as well as a challenge. To perfect their teaching, teachers should reflect on and improve the curriculum through their analysis on the massive teaching data.

Various online teaching platforms become the main way to learn knowledge for students.[3] The teaching platforms can help students to complete their learning tasks within the prescribed time, and to improve their learning efficiency. Furthermore, the online learning resources can facilitate the
students' autonomous learning. Passive learning is transformed into active learning, students’ dominance in learning is further determined, and therefore, innovative talents qualified for all kinds of jobs in the current society are cultivated.

2 Teaching Reform Strategy of Computer Application Courses Utilizing Big Data Related Technologies

Under the current background, the utilization of big data related technologies has become an inevitable choice for higher vocational college computer application teaching, to promote educational innovation, and to improve educational quality. It can reform the mode, methods and resources of teaching, thereby improve the teaching quality.

2.1 Establishing Online Information Teaching Platforms, and Reforming the Teaching Mode

The computer application teaching with big data applied can be classified into classroom teaching mode and online teaching mode. Computer application courses in higher vocational colleges are courses with high operational requirements. Besides preparing lessons carefully and carrying out good classroom teaching, teachers have to set up an online information teaching platform to carry out online teaching. On the one hand, information-based teaching through online platforms focuses on students’ development, fully reflecting the dominant role of students in learning, moreover, stimulating students’ learning enthusiasm. On the other hand, it enables teachers to get rid of the teaching dilemma, changing their roles into the organizer and guide of learning.

In this context, an online learning system based on a mobile platform has been developed for network-based teaching as a supplementary to the traditional classroom teaching mode. This paper takes computer application course as an example to discuss how to improve teaching quality by means of big data.

This system helps teachers to use mobile intelligent devices to carry out various teaching activities before, during and after classes, and to effectively realize the communication and data management. In the system, teachers provide materials and information for students to download. Courseware of related cases can be uploaded for students’ extracurricular study. Students’ classroom study is reinforced and their extracurricular study is expanded. Videos of explanation of some knowledge points can be uploaded for students to prepare and review their classes. Relevant works by teachers and outstanding works by students can be added for students' extracurricular study.[4] After logging into the system, students can study online, browsing the courseware, asking questions, submitting homework, submitting videos, and so on.[5] Teachers and students can carry out homework tasks, question-answering discussions, tests and other activities in the system, and the system will track, monitor and record the participation, completion and assessment of the activities.

Teachers can use the simulation test and evaluation system in the online learning system to obtain the periodic data of students’ learning results, to carry out comprehensive analysis on the big data in combination with the learning status in classroom teaching mode, and to establish learning archives for students. A learning plan is developed for each student on the basis of the analysis results, personalized education is put into effect, and students’ subjectivity in their study is highlighted.

In the big data era, teaching methods will no longer be limited to classroom. Online teaching is now an important way of knowledge transmission.[6] Although online teaching has many advantages, it is incorrect to simply abandon the conventional teaching mode. Instead, we should devote ourselves to effectively combining the two teaching modes and developing a new teaching mode suitable for our own major.

2.2 Adopting Hierarchical Teaching, and Improving Teaching Methods

Teachers analyze students' learning situation and improve teaching methods through the massive data obtained from both the classroom and the online teaching.[7] On account of the differences in student's computer levels, the classroom teaching may be too easy for some students but too hard for the others. For this kind of situation, the hierarchical teaching method can be used.
Students who have spare energy in learning are recommended to learn the extended knowledge and to use the advanced application module in the learning system, which can speed up the learning progress and increase the learning difficulty. For middle-level students, the use of consolidation exercises and knowledge point explanation module are recommended, which can help students better review what they have learned. For students with learning difficulties, it is recommended to use the basic knowledge and operational practice module, which can repeat the basic part of the study, laying a good foundation for gradual improvement.

2.3 Using Various Teaching Techniques, and Integrating Teaching Resources
In the big data era, based on the reality and the requirements of students, the active application of all kinds of advanced means of modern education technology, such as micro-lectures and MOOC, in higher vocational computer application courses, can not only achieve the transform from the conventional knowledge-imparting mode of teaching to a teaching mode with priority to exploration, discovery, collaboration and innovation, but also help with the integration of teaching resources, the improvement of teaching contents, and the promotion of the teaching quality.

Massive open online courses, referred to as "MOOC", are actually a new type of online education. Video-based online courses with interactive functions are released to the Internet for free for students to learn, realizing the large-scale sharing of educational resources. MOOC are a new concept and mode for teaching, and have been actively promoted in various regions of our country, enabling the co-construction and sharing of high-quality resources.

Compared with MOOC, micro-lectures are compact, which are a series of micro-course videos or PPT that divides learning tasks into knowledge points.[8] For example, while teaching the application of basic functions in Excel, teachers can make short videos on the established teaching goal and the basic concept, using purpose and concrete application methods of functions like RANK, COUNTIF, etc. then send them directly to the online learning system. Students prepare and review their classes by watching these videos online, thus they can quickly grasp the important and difficult contents of the courses. Micro-lectures can give students the time and direction to work on and resolve the problems they encounter in their study. Therefore, students’ fragmented time is integrated, mobile teaching is realized, and the needs of students' after-class learning are met to the greatest extent.

Conclusion
It is an inevitable trend to use big data related technologies to improve computer application courses in higher vocational education, which provides a new direction for future teaching reform.[9] Every educator should actively cultivate his "big data thinking", introducing advanced ideas, methods and theories, making their own analysis and prediction of teaching reform, repeatedly examining, reflecting and improving the course resources. In this way, we can train innovative, knowledgeable, proactive and energetic new interdisciplinary talents for the society, conforming to the requirements of the Times.

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