

Application of On-line and Off-line Teaching Mode in Equipment Course Teaching for Military Academies

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Abstract: In order to carry out the innovative practice research of equipment teaching mode in military academies under the condition of information, the limitations in the application of on-line and off-line teaching mode for equipment course were summarized in the principle of educating people for war, based on analyzing the characteristics of on-line and off-line teaching mode. The application measures of on-line and off-line teaching mode in equipment course teaching for military academies were also put forward, such as teaching comprehensive design based on on-line and off-line teaching mode, teaching system construction based on SPOC, integration of tracking analysis for online learning situation and practice of flipped classroom teaching model, assessment of the whole process of knowledge ability. The above measures were applicable and practical in the application of equipment course teaching, and had certain reference value.

1. Introduction

Under the background of developed network information, the education of military academies was still dominated by the wrong ideas such as teacher-centered and classroom teaching, and the student-centered education concept had not been fully implemented. The teaching effect of equipment courses was not satisfactory, and ultimately restricts the quality level of talent training in military academies. Especially under the background of education for war and educating people for war, the innovation research of equipment course teaching mode under the condition of information in military academies had become the responsibility, mission and practical demand of college teachers. Obviously, equipment course was the core basic course directly related to the training of trainees' post ability. Based on the analysis of the characteristics of the on-line and off-line teaching model, the application reform of the on-line and off-line teaching model was carried out to further strengthen the participation of students in the above course learning, fully mobilize the enthusiasm and initiative of students, and comprehensively improve the teaching effect of the course.

2. Analysis of the Characteristics of On-line and Off-line Teaching Mode

Generally, it was believed that the mixed teaching modes roughly divided into three categories: (1) mixture of teaching modes or transmission media; (2) mixture of teaching method; (3) mixture of on-line and off-line teaching. The four steps were divided in the process of blended teaching: first understand the needs of students correctly; secondly different study plans were customized according to the different characteristics of different students; thirdly the course content was defined according to the specific implementation environment of blended teaching; fourthly the teaching effect should be tracked and evaluated comprehensively in the process of blended teaching. There were three common blended learning models: skill-driven model, attitude-driven model and ability-driven model. For the equipment course, in the process of blended teaching, the teaching application practice should be carried out according to the ability-driven mode, which should be guided by the cultivation of post holding ability.

With the help of network media and the computer information network technology, on-line and

off-line teaching mode was the integration of online teaching and offline teaching, which was the combination of online learning relying on online platform and offline face-to-face classroom learning. On-line and off-line teaching mode was beneficial to change students' learning style and teachers' teaching style, realize resource sharing and improve teaching quality, which had the characteristics of openness, interactivity, individuation, convenience and generation^[1]. On-line and off-line teaching mode tried to realize the integration of offline teacher-centered teaching and online student-centered learning, which could not only complete the prescribed content of the syllabus, but also promote students' active participation and reflection, which has unique advantages in the teaching and popularization of basic knowledge.

3. Limitations of the Application of On-line and Off-line Teaching Mode for Equipment Courses in Military Academies

Different from the general local colleges and universities, a teaching reform to educate people for war was carrying out in military academies. Not only a lot of high-quality high-tech talents should be trained for PLA, but also applied talents trained who understand equipment and can use equipment. Equipment course was the core course of training students' post holding ability in military academies, and the key course related to the quality of personnel training in military academies. For equipment courses, due to the types and models of equipment involved, the following limitations may be found in the application of on-line and off-line teaching mode for the above type of course:

Firstly, It was difficult to develop teaching design by on-line and off-line teaching mode for equipment course. The teaching content of equipment course had many difficult knowledge points, not only technical engineering applications, but also core issues such as equipment working mechanism, workflow analysis, operation and maintenance. High requirements of the teaching process were put forward, and the teaching content was not universal, which cannot carry out large-scale online teaching. Therefore, in the process of course design, it was necessary to separate the teaching contents and equipment, such as technical principles and application implementation, to meet the needs of online learning; and offline teaching content, such as the equipment working mechanism, engineering process, use and maintenance and etc should be determined. According to different teaching contents, different teaching methods were adopted to integrate online teaching and offline teaching.

Secondly, it was difficult to build online and offline teaching resources for equipment courses. For equipment courses, due to equipment involved and its high professional requirements, small audience, online teaching resources for large-scale online teaching based on MOOC platform could not specially developed, especially under the background of small-class teaching in military academies. The teaching contents of equipment courses were highly targeted and special, offline teaching mode should be applied indispensable for most of the teaching contents. The teaching resources for equipment courses should be developed by teacher and technical personnel of equipment in a systematic plan, which was difficult to develop and been enriched and refined for a long time.

Thirdly, it was difficult to realize the online and offline teaching system for equipment courses. For equipment courses, large-scale online teaching could not be carried out in military academies by means of online classes, MOOC platforms, etc. It was impossible for teachers and students to carry out real-time, effective and sufficient teaching interaction by means of forums, WeChat groups, QQ, email and other media^[2]. Restricted by information construction conditions and management requirements, students couldn't learn anytime and anywhere, and restricted by the teaching content, teaching class hour limited, a one-to-one or one-to-many relatively complete online teaching system was developed for equipment courses, nor for a particular problem, sufficient knowledge interaction, analysis and study of students autonomous learning participation remains to be promoted. Students and teachers were unable to fully interact, analyze and research specific problems and knowledge points, and students' participation in independent learning was

poor.

4. Application measures and Practical Effect of On-line and Off-line Teaching Mode for Equipment Courses

According to the characteristics of equipment courses,a student-centered online and offline teaching system was build on the teaching conditions of military academies.The application practice of on-line and off-line mixed teaching mode was carried out around the course teaching design, teaching system construction, curriculum organization and implementation, assessment and evaluation^[3].

4.1. Integrated Design of Equipment Courses on On-line and Off-line Mixed Teaching Mode

Generally speaking, equipment courses were the engineering applications of modern technology in the field of military equipment. In terms of teaching contents, a series of engineering application points of equipment courses, such as technical principles and technical implementations, which could be decomposed and separated from the equipment, could be condensed and summarized in subjects and series so as to adapt to the needs of online teaching method.For the core contents such as the working principle, process, use maintenance,offline teaching was carried out,practice teaching also carried out by means of principle experiment and simulation training,so as to promote the mutual integration of theory teaching and practice teaching, effectively achieve the integration of theory and practice, promote the integration of professional knowledge learning and post ability training.

4.2. Construction of a Teaching System for Equipment Courses based on SPOC Mode

In view of the teaching contents such as technical principles and technical implementations, the knowledge points were designed into relatively independent and short teaching segments, which were displayed in the form of micro-lectures and MOOC courses, so as to facilitate online learning and fragmented learning. The online learning progress and learning problems of the students were accurately mastered by while online self-directed learning.Based on the SPOC model and smart classroom hardware facilities such as professional classroom, a teaching resource library involving the core content of equipment principle, use and maintenance,was constructed to promote autonomous inquiry learning and group collaborative learning.

4.3. Real-time Tracking Analysis of Online Learning and Practice of Offline Flipped Classroom Teaching

In the application process of the online and offline mixed teaching mode for equipment courses, the convenience and readiness of online communication should be fully exploited. Based on the construction of smart campus conditions, the equipment course learning group should be set up. Before the implementation of the course teaching, the learning situation of the trainees' leading course should be mastered in real time, the learning basis of the trainees' course should be analyzed, and the targeted design should be carried out, in order to check the leakage and fill the gaps in the course implementation process, and improve the learning effect of the course.During the course teaching,students' learning progress and mastery of online content were tracked, and real-time communication and discussion were conducted with students on difficult knowledge points. Meanwhile, in the process of offline teaching , flipped classroom teaching practice was strengthened, so that difficult knowledge points were analyzed and discussed between teachers and students together, so as to improve the enthusiasm of students to stimulate their independent learning.

4.4. Comprehensive Assessment of Knowledge and Ability in the Whole Teaching Process

For equipment courses,the combination of online theoretical assessment and offline practical assessment was proposed on the comprehensive assessment mode of the whole process of knowledge and ability.In the application process of the online and offline mixed teaching mode for

equipment courses, a theoretical examination question bank was built according to the online teaching content, and the students' mastery of the teaching content such as technical principles and technical implementation was evaluated through after-class exercises and online theory assessment. At the same time, in the offline teaching, students' practical ability was comprehensively evaluated through the forms of reverse class teaching practice performance, test principle experiment, simulation training operation, etc. Online theoretical assessment and offline practical assessment were combined, professional knowledge assessment and practical ability assessment were integrated, the concept of process assessment was implemented [4], and students' course learning was comprehensively evaluated.

4.5. Application Effect of On-line and Off-line Mixed Teaching Mode for Equipment Courses

The online and offline mixed teaching model was applied in teaching practice of equipment course such as "Comprehensive Test of a certain Missile Control System" in the 2019-2021 academic year. Through Summarizing the equipment teaching process and assessment situation, the course teaching had achieved good results after the implementation of the above online and offline mixed teaching mode measures, mainly in the following aspects:

(1) Through the online self-learning and discussion method of flipped classroom, the autonomy and enthusiasm of students were greatly improved, the teaching interaction was more positive and effective, and the learning atmosphere was significantly improved. It was no longer the rhythm of "one word", and students were brave to express their views and opinions.

(2) Through practical teaching such as principle experiment and simulation training operation, the systematic thinking ability and practical ability of students had been fully cultivated, the ability to analyze and solve problems improved, and the cultivation of students' ability to use and maintain equipment strengthened.

(3) Through the application of the online and offline mixed teaching model for equipment courses, especially the whole process comprehensive assessment of knowledge and ability, a total of 50 trainees have been trained, and their abilities and qualities have been fully recognized by the army's employing units.

5. Conclusion

Equipment courses were the core curricula related to the transformation of education development in military academies. it was impossible to rely entirely on online learning and large-scale teaching on the MOOC platform determined by the object and content of the above courses^[5]. Therefore, it was of great practical significance to carry out the application research of online and offline mixed teaching model for equipment courses.

Based on analyzing the characteristics of on-line and off-line teaching mode, the limitations in the application of on-line and off-line teaching mode for equipment courses were summarized in this paper, the application measures also put forward. The application measures of on-line and off-line teaching mode, were applicable and practical in the application of equipment course teaching, and had certain reference value.

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