The Study on Application of MOOC in Postgraduate Military Operation Research Courses

Chang-long Wang\textsuperscript{a} and You-xi Wang\textsuperscript{b}

School of Logistics University of PAP, Tianjin 300309, China
\textsuperscript{a}616271788@qq.com, \textsuperscript{b}w4997710@126.com

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Abstract. The role of Massive Open Online Course (MOOC), which has unique advantages and characteristics, is not established in postgraduate military operation research courses. This paper investigated the status quo of traditional postgraduate military operation research courses and analyzed the characteristics of MOOC. Our results suggest that the military academy should be exposed to the forefront of educational reform and get rid of the drawbacks and shackles of traditional military operation research courses, so that they can focus on postgraduate learning needs and promote the construction of military operations research courses to a new height.

1. Introduction

Military operation research mainly applies mathematical tools and modern computing technology to quantify military problems and provides quantitative basis for military decision-making. It is a comprehensive and practical subject. Military operation research is a core professional course for postgraduates in military academy, which is not only an extension of undergraduate mathematics courses, but also a base course for graduate students. Military operation research provides the basic ideas and methods of curriculum for graduate to solve professional matters and is a useful tool in the graduate scientific research which plays an important role in graduate academic research. Nowadays with the development of the MOOC in Colleges and universities in our country, attending the online courses is a kind of fashion\cite{1}. Also the MOOC can integrate high-quality educational resources and explore new modes of learning military operation research course, which has important significance to enhance the curriculum teaching effectiveness.

2. The Current Situation

Operational research was born in the early part of last century, and it is an interdisciplinary subject that combines military science and natural science. After World War II, the economic construction and civil field drew on its ideas and methods, and there appeared the difference between operational research and military operation research. Military academy almost has opened military operation research courses, theory and method to study military operation research courses, has become the objective requirements of troops carry out diversified military tasks. At present, large-scale military reform is facing severe challenges in teaching research and practical application of military operation research, and the development of information-based teaching means also puts forward higher requirements for teaching.

Wide knowledge and strong comprehensive are involved in the military operation research courses’ content, which the teacher can only be cut on the course in the limited time. In order to achieve the purpose of teaching, they mainly choose such as the Lanchester equation and Game theory and Command classic theory to learning. The contradiction between the more content and the less time and the postgraduate diversiform professional background and research directions so that teachers in the teaching process only make arrangements of classical theory, which makes difficulties for postgraduates to apply military operation research methods in the subsequent professional learning.

Nowadays the troops need to use military operation research methods to solve problems quantitatively. The carrying amount of articles to carry out the task and the guarantee in the layout of the site and so on, are now pretty much the agenda for troops. However the military operation
research course only stay in the basic theoretical level and the use of the old style classic examples in teaching is hard to make up the gap between the theory study and practice application. For the teaching mode, the traditional way of watching courseware and taking notes give first place to and the teaching methods of information technology are seldom used. So the teaching efficiency is not satisfactory. The military operation research course failed to be close to the actual situation of the army, and the postgraduates were unable to apply their knowledge and their ability to solve practical problems was not strong, which greatly weakened the practicability of military operation research.

Military operation research is a highly applied course and in the course of postgraduate teaching where teachers pay too much attention to explaining the background of problems and explaining concepts and deducing formulas which weakens the role of postgraduates' active exploration. In teaching methods, teachers give a whole lecture and students keep listening. The teacher occupies most of the class time. The regular grades almost are "Classroom teaching - Homework" pattern and the final examination almost is the submission of the paper. The communication between students is not obvious; causing the military operation research is divorced from the troops’ reality and the postgraduates’ lack of the ability of modeling.

3. The Main Characteristics of MOOC

MOOC (Massive Open Online Course) is for the public free open network curriculum. Compared with the traditional online education, MOOC is not only teachers tell you what to learn, but with the network technology, classroom teaching, learning process, students’ experience, teacher-student interaction and process system to achieve a whole online course, in order to form a "learning in doing" mode[2,3]. The student-centered teaching concept has changed the fixed and structured features of the traditional web-based courses, and has enabled students to acquire knowledge from simple linear to diversified and networked. The main features of MOOC are as follows:

3.1 Less indoctrination and more interaction

MOOC takes questions as the core of the curriculum, which takes the video as the main carrier and the time length generally is 10 - 20 minutes. Different from the previous network on the popular video open class, MOOC courses make knowledge transaction as interactive problem embedded into video, where a predetermined node will pause and then the students answer questions, submit homework. In addition, teachers can track students’ class dynamics at any time, conduct online guidance by the interactive platform and students can also take online discussion on the platform and exchange learning experience with each other. MOOC will abandon the traditional teaching disadvantages and encourage students to take the initiative to explore and achieve the faculty from imparting knowledge to guide the transformation of learning actively and the students from the knowledge of the recipient into active participants.

3.2 Less general management and more personalized services

MOOC takes the knowledge point as the core to carry on the curriculum, which breaks the tradition teaching organization by the class hour. Each knowledge point form a micro video which does not need to spend a longer time and energy so as to meet habits that the current network users to a single page or the content of attention are not lasting for long. At the MOOC platform, the students based on the existing knowledge to constantly construct new knowledge. By the comparison of the data, we can learn that the students’ mastery of learning content, track memory "attenuation curve" which can facilitate students check the learning effect of their own timely and improve learning methods. Moreover all kinds of problems can feedback to the teacher so that they can make personalized guidance to each student.

3.3 Fewer dogmas and more flexible school systems

MOOC as a new teaching mode make the location of the class no longer adhere to the classroom and the teacher can be anywhere in the office or training center take the face to face teaching which makes up for the digital whose scene is not realistic. This way of learning, students can choose to different network tools and platforms, meet their needs for online learning courses, develop their
own learning goals, and control the learning process according to personal preferences. MOOC can get rid of the traditional mode of teacher evaluation "across the board", focusing on self-assessment, peer assessment, which is good for students to exchange learning experience and stimulate students' learning enthusiasm. MOOC is easy to get started and has few rules and regulations. It is more suitable for students who have different backgrounds, uneven levels and fragmented learning time.

4. The Advantages of MOOC Applied to Postgraduate Military Operation Research Courses

Military operation research, as a required course for military academy’s postgraduates, has its own rules of construction and development. In the teaching practice, the use for reference from the successful experience of domestic and foreign MOOC education curriculum and the new use of MOOC brings new mode and drawbacks of traditional teaching which can get rid of the shackles and staring at the postgraduates’ learning needs will promote military courses construction to a new level.

4.1 Strengthen the subject position of students in the course of teaching and learning

At the MOOC platform, the course of military operation research takes postgraduates at the center location and strengthens the subject status of students in the course of teaching and learning. Students take the initiative to collect information, understand problems, generation background, basic concepts, and prepare knowledge after class. The online classroom achieves by the students’ independent thinking and the curriculum emphasis more on interaction and problem solving. The embedded curriculum interactive problems not only urge students to grasp the importance and difficulty of military operation research but also make the curriculum effectively converge. On the interactive platform, students can discuss and communicate with each other, express their views on questionable and hot issues, and promote the digestion and absorption of operational research knowledge. Through the MOOC platform teachers are to guide learning and track the real-time dynamics of students and the problems appeared in the course which can correct timely. By the data comparison, teachers can make personalized recommendations for each direction of students. MOOC course has a variety of evaluation methods, students can solve a practical problem facing cooperation forces, also can be carried out in-depth study for a project. Using MOOC platform, students can write reports, papers, computer programs, finally gets a mutual evaluation score by the teacher and students.

4.2 Integrating high-quality resources in the course of military operation research

MOOC takes advantage of the online network and facilitates the integration of high-quality resources in the curriculum[4]. MOOC as a student-centered teaching mode, make teachers have more time and energy to elaborate course, absorb the latest research achievement and postgraduates can take the basic theory of related learning or professional curriculum. The teaching-focused, targeted-curriculum resources will stimulate the students’ learning enthusiasm; meet the demand of postgraduates of "high level" and "diversification". At the same time, MOOC can rely on the military integrated information network, preferred to hire talent troops first related which can make the postgraduates exercise ability of the quantitative analysis, train a scientific decision-making habits and make up the gap between military operation research course in theoretical study and practical application. The MOOC platform relies on modern computer technology, which also provides advanced teaching methods for military operation research courses. The course can be embedded in Matlab, Lindo, Lingo and other software tools which can reduce the waste caused by manual calculation time, improve the postgraduates’ practical ability, create high efficiency model with the help of software modeling, data processing.

4.3 Enhancing the charisma and influence of the course of military operation research

MOOC relies on powerful network technology and multimedia information processing technology to get rid of the restriction of class, geography and time. Postgraduates can take courses according to their own arrangements at any time. The MOOC course has flexible place for the class, and the postgraduates can participate in the course study in the library, dormitory and classroom. The choice of the time and place of the course enhances the inspiring power of the course. At the
MOOC platform, the teacher may at any time publish courses and provide solutions with military operation research knowledge of hot issues the troops facing so that it can not only enhance the postgraduates’ study enthusiasm, but also provide a quantitative basis for military decision. Relying on military integrated information network, MOOC can send military course to every corner of the army. Officers and soldiers comment with interests and college students participate in the discussion, huge learning groups not only provides a method to support reform of courses for military operation research but also provides data for troops to solve practical problems.

5. Summary

This paper investigated the status quo of traditional postgraduate military operation research courses and analyzed the characteristics of MOOC. Our results suggest that the military academy should be exposed to the forefront of educational reform and get rid of the drawbacks and shackles of traditional military operation research courses, so that they can focus on postgraduate learning needs and promote the construction of military operations research courses to a new height.

6. References


