

IMPLEMENTATION OF A MOOC COURSE FOR ONLINE DISTANCE EDUCATION

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Abstract: National University of Defense Technology has offered MOOC course «Precision Guidance Techniques» online since 2017. This paper summarizes the teaching implementation of this course in detail and evaluates its teaching effects. Specifically, we analyze the statistical data recorded since 2019, and evaluate the distance education effect from several aspects such as student number, activity of online discussion and course scores. We conclude that the teachers' participation and the students' insistence are both important for online teaching. These conclusions are useful to implement distance education in the future.

1 Introduction

As a new distance education form, MOOC (massive open online courses) has the characteristics of strong inclusiveness and communication ability [1-2]. National University of Defense Technology has offered many MOOCs online. Among them, MOOC "Precision Guidance Techniques" has been put on the xuetangX.com platform since 2017. This course is one of the national top-level online courses now.

This paper summarizes the teaching implementation of MOOC «Precision Guide Technique», and focuses on the analysis of the course data collected by xuetangX.com in the past three years. By analyzing the data from the aspects of student number, online discussion, course scores, this paper provides a useful reference to optimize the teaching mode for distance education.

2 Teaching implementation

The MOOC «Precision Guidance Technique» itself is an excellent online course. Since the course was put online in May 2017, it has provided distance education resources for more than 100,000 college students and social learners. Students who take our course are in major universities across P.R. China, including Xi'an Jiao Tong University, Northwestern Polytechnical University, Beijing University of Aeronautics & Astronautics, Harbin Institute of Technology, Xidian University, Beijing Institute of Technology, etc. In 2020, this course was awarded one of the national top-level online courses by Chinese Ministry of Education.

3 Data Analysis

The MOOC «Precision Guidance Technique» was put on the xuetangX.com website in 2017. The website records the statistical data of all distance learning students completely. Based on these data, we analyze and find out the distance education effects since 2019.

3.1 Analysis of students number

Since 2019, xuetangX.com has offered our MOOC for four semesters with total 14,796 students who choose the course. Fig. 1 shows the number of students who choose our course in each semester, and Fig. 2 shows the location distribution of all students in our online classes.

By counting the number of students from the autumn semester in 2019 to the spring semester in 2021, we find that the student number increase steadily in Fig 1. It shows that more and more students become interested in distance education now. From Fig. 2, we come to know that the students spread the whole country that reflects a major feature of MOOC, i.e., the distance

education is no longer limited by space, thanks for the rapid development of modern information technology.

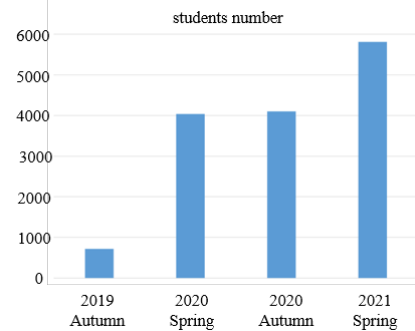


Fig. 1 Students number in four semesters

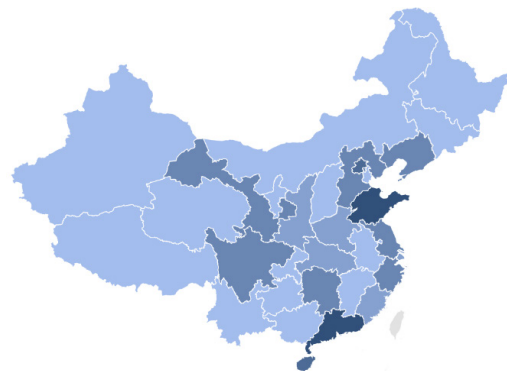


Fig. 2 Location distribution of students (darker means more)

3.2 Analysis of online discussion

We insist on online discussions with all students. The teaching team posts issue announcements regularly for all students according to the teaching plan and reminds them to study the corresponding content in advance. We also establish a Question & Answer group to answer questions by students in the discussion board on time, e.g., in the spring of 2020 the number of interactions per person in our discussion board reached 15 times per person. That exceeds 94% of the online courses on the xuetangX.com website.

In the spring semester of 2020 the teachers and the students communicated enthusiastically. The total number of questions & answers by students is 2411, and the total number of questions & answers by teachers is 401. Fig. 3 shows the interactions number of students who get different final course scores and the teachers'.

As a contrast, the interactions number of students and teachers in the spring semester of 2021 is plotted

in Fig. 4. The total number of the questions & answers by students is 1592 while the number of questions & answers by teachers is only 18.

Comparing discussion data of two semesters, we confirm that the positive response from teachers can promote the activity of students and stimulate their enthusiasm for online course learning [3-4].

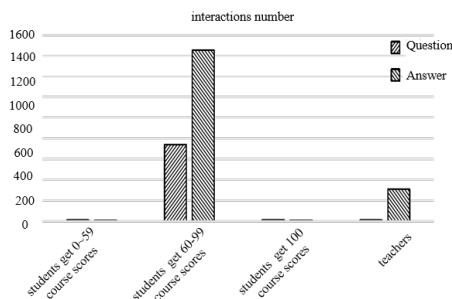


Fig. 3 Interactions number in the spring semester of 2020

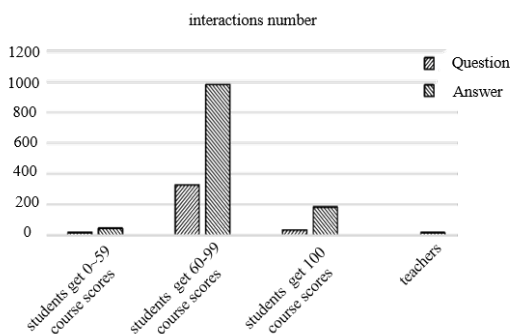


Fig. 4 Interactions number in the spring semester of 2021

3.3 Analysis of course grade

The course grade of this course has three parts, teaching video completeness, unit assessment performance and final test score, which account for 20%, 40% and 40% in course grade respectively.

For example, the percentages of all students' completeness of watching the course video in 2021 spring semester is plotted in Fig. 5. From Fig. 5 we find that only half of students complete teaching video requirement.

We also find that the students' course grades are highly correlated with their course completeness. Fig. 6 plots the student number with different course grades on 100 scale in the spring semester of 2021, which coincides with the distribution in Fig. 5.

Fig. 5 and Fig. 6 illustrate that the students who get high grades are those insist on studying the whole online lessons. And the students who get low grades or even fail to pass the final test are those only watch a small part of the whole teaching video. It also shows the importance of self-discipline in distance education.

4 Summary and Conclusion

This paper summarizes the teaching implementation of the MOOC «Precision Guidance Technique». By analyzing three years statistical data, we discuss the

distance education of an MOOC course from different aspects. The conclusions are given as follows.

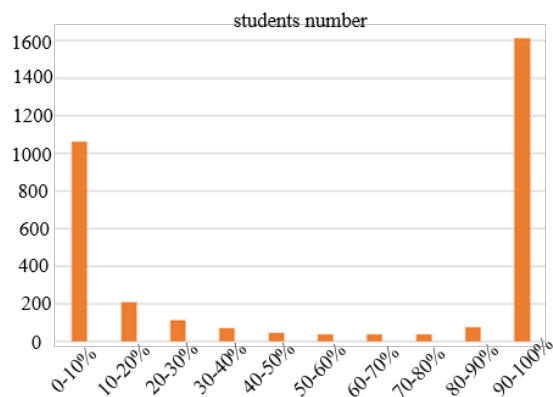


Fig. 5 Teaching video completeness (%) of all students in the spring semester of 2021.

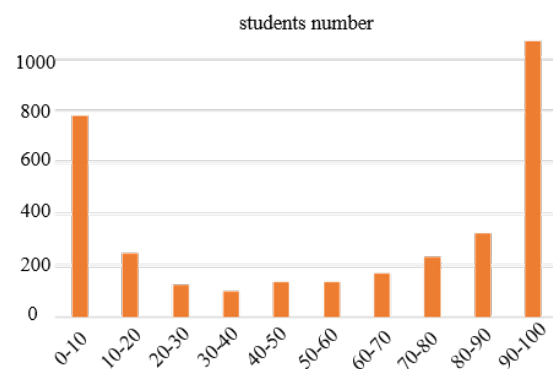


Fig. 6 Course grades (100 scale) of all students in the spring semester of 2021.

1. The participation of teachers is very important and the Question & Answer discussion is a very useful method. Active interaction between teachers and students increases the students' learning enthusiasm significantly.

2. The completeness of whole course learning is important, which indicates the students' course grades. In order to encourage all students to finish the online teaching video, we are going to update our distance education resources in the future.

References

1. Zhao, R., Ma L., Zhang Y.L.. The rational thinking about the MOOC: growth, development and the future. *Journal of Higher Education Research*, 2014, 37(002): 9-14.
2. Wang Q. The evidences of MOOCs' impact on higher education. *Education Research*, 2016(6):37-43.
3. Zhou J.X., Wu J., Luo P.F.. An analysis on flipped classroom teaching mode based on MOOC resources. *Journal of Higher Education Research*, 2017, 40(004): 50-55.
4. Fan Y.Z., Wang Y., Feng F., Wang Q., Li X.M.. A study of MOOCs: student learning and course evaluation. *Education Research*, 2014, (3): 27-35.