Relying on Learning, Thinking, Practicing and Understanding Under the Blended Learning Model to Promote the Ideological and Political Construction of College Mathematics Courses to Go Deep and Practical

Ping Du(✉), Wei Liu, Xiaoyan Qiao, and Lin Guo

Shandong Technology and Business University, Yantai 264000, Shandong, China
201513218@sdtbu.edu.cn

Abstract. Based on learning, thinking, practicing and understanding, this paper explores the main ideas of the ideological and political construction of college mathematics courses under the blended learning model, which are mainly carried out from four aspects: the construction of knowledge system, the transformation of teaching concept, the promotion of blended learning model and the reform of evaluation method. Besides, it also carries out a specific case analysis and gives ways to achieve a good teaching effect.

Keywords: Fostering character and civic virtue · Course ideology and politics · Online and offline teaching · Synergistic effect

1 Introduction

The fundamental task of higher education is to foster character and civic virtue and General Secretary Xi Jinping called it "the grand plan of the country and the party" [1]. The general secretary pointed out at the celebration of the 100th anniversary of the founding of the Communist Youth League of China that, "It is very necessary to set up ideological and political courses in universities, middle schools and primary schools in a gradual and spiral manner, which is an important guarantee for cultivating generations of socialist builders and successors." [2]. College education is the last stage of learning before students enter the society. Students at this stage have certain independent thinking and judgment. This stage is also a critical period for the formation of their world outlook, outlook on life and values. Their value orientation is not only related to their own healthy growth, but also affects the value orientation of the entire society in the future. As grassroots educators in colleges and universities, teachers must base themselves on learning, thinking, practicing and understanding, embed the content of ideological and political courses in the course of class, adhere to the combination of knowledge imparting

Fund: Project M2021354, supported by Reform Project in Shandong Province

O. Chistyakova et al. (Eds.): ICCESSH 2022, ASSEHR 694, pp. 329–336, 2023.
https://doi.org/10.2991/978-2-494069-43-5_37

and value guidance, the unity of teaching and educating people, the unity of teaching by verbal instruction as well as personal example, and the unity of theory and practice, and cultivate students' professional accomplishment and patriotism, so that they can become socialist builders and successors with both ability and political integrity, and put morality first.

The ideological and political construction of college mathematics courses refers to the reform of public basic courses such as advanced mathematics, linear algebra, probability theory and mathematical statistics, the construction of a reasonable knowledge structure system, and the promotion of the combination of college mathematics course content and ideological and political content through the carrier of classroom. "In each course, teachers must guard a section of the canal, plant a good field of responsibility, and make various courses and ideological and political theory courses go in the same direction to form a synergistic effect" [3], so as to cultivate high-quality talents who combine knowledge and ability with correct outlook on life, world outlook and values. This paper mainly discusses the following four aspects.

2 Construction of Knowledge Structure System

In the construction of the knowledge structure system, teachers should optimize the teaching content, transforming relatively boring and single theoretical knowledge into a high-level, innovative and challenging knowledge system with rich ideological and political connotations, so as to strive to realize the normalization of course ideology and politics, the modernization of course content, and the integration of knowledge structure.

2.1 Normalization of Course Ideology and Politics

Teachers should continue to promote course ideology and politics into the classroom, adhere to the combination of knowledge imparting and value guidance, enrich students' knowledge, and cultivate high-quality talents with noble sentiments and family and country sentiments. The teaching design of the course ideology and politics into the classroom is very important, which should not only integrate patriotic feelings, educate people collaboratively, but also pay attention to the transmission of knowledge points. This paper mainly explores course ideology and politics cases from the following aspects:

- Teachers can construct application cases combining heroic characters and knowledge points, penetrate the whole teaching process, inherit the national spirit, cultivate students' patriotic feelings, and stimulate their enthusiasm and initiative in learning. For example, when talking about the inverse of a matrix, teachers can introduce its application in cryptography and introduce Mr. Loo-Keng Hua, the father of Chinese cryptography. During the Anti-Japanese War, Mr. Hua, regardless of the good life in Britain, returned to China's position in the Anti-Japanese War with the intention of serving the motherland, and successively completed more than 20 papers and the mathematical work "Additive Theory of Prime Numbers". In 1943, when Mr. Hua led the team to discuss the possibility of China making an atomic bomb, the Chinese army intercepted cryptotexts from the Japanese army. When the staff couldn't translate

it, Mr. Hua decided to decipher them overnight and quickly translated the Japanese army's unscrupulous battle plan. Through timely prevention, the casualties of the Chinese army were greatly reduced and the safety of the local people was ensured. It is precisely because during the Anti-Japanese War, countless unknown revolutionaries risked their lives to decipher the enemy's code or collect information on the enemy and contributed to the victory of the revolution, that people are now living a happy and stable life. It is more important for students to cherish this hard-won life, love the party, love the country and love their families in the future, exercise their knowledge and ability, have a sincere heart, and strive to improve themselves and dedicate themselves to the development of the Chinese nation [4].

- Teachers can bring mathematics culture into the classroom and introduce mathematical ideas, origins and mathematician introductions of relevant knowledge points, which not only allows students to understand the background of knowledge and expand their knowledge, but also promotes the spirit of mathematicians' perseverance and dedication to science and cultivates students' spirit of advocating science and persevering in forging ahead. For example, when explaining the solution of linear equations, teachers can tell students that the elimination method to solve equations actually appeared in China more than 1,000 years before Western countries. In ancient times, when there was a war, eating was a big problem. After verification, a group of 13 people needed 850 pots to eat and a group of 8 people needed 1,381 pots to eat. In addition, the issue of cooking efficiency was also considered. These are all applications of equation solving. Practice proved that generally a group of 10 people was the most suitable. Teachers can now introduce the famous Battle of Maling of Sun Bin and Pang Juan. At the beginning of the battle, according to Sun Bin's strategy, on the first day, there were pots for 100,000 people in the Qi army camp, pots for 50,000 people on the second day, and pots for 30,000 people on the third day. Seeing this, Pang Juan was delighted and said proudly, "I already knew that the soldiers of Qi State were cowards, and now, most of them have escaped in less than three days." In the end, Maling won victory, Pang Juan was defeated badly, and Sun Bin gained considerable fame. In modern times, the application of equations is also very extensive, such as solving optimization problems.
- In the process of explaining the knowledge points, teachers should closely follow the meaning of the question, combine with the heroes of the times, and teach students to apply the knowledge points to solve practical problems in real life in the process of awe of the heroes, so as to improve students' patriotism and problem-solving skills. For example, when explaining the linear representation of vector groups, teachers can combine the spirit of Chinese anti-epidemic hero General Chen Wei to study vaccines and introduce the problem of formula ratio of medicines, which can not only promote the spirit of the era's model General Chen Wei, who is not afraid of difficulties and obstacles and sacrifices herself for the public good, but also apply knowledge points to solve practical problems in real life.
- Teachers can combine knowledge points with classical culture. When talking about the rank of the vector group and the maximal linearly independent group, teachers can use the story of Three Times Beating the White Bone Demon in "Journey to the West" to introduce the concept of rank. Sun Wukong relied on his magic eyes, and no matter how the appearance of the White Bone Demon changed, the inside remained

the same. It can be understood as that the rank is invariant, and is all generated by the maximal linearly independent group. After further exploration of the China's four great classic novels, they all contain the essence of mathematics.

2.2 Modernization of Course Content

Teachers should combine knowledge points with frontier issues in education, add some exploratory content and extended content, combine knowledge points with the content of various professional courses, and pay attention to the practicality and application of the content. On the one hand, this can deepen students' understanding of knowledge points, and on the other hand, this can improve students' practical application ability. For example, when teachers teach students form computer major, they can combine with cutting-edge knowledge points such as big data and machine learning. When explaining the eigenvalue and eigenvector of matrices, teachers can introduce PCA data dimension reduction, which is popular in big data learning, and face image processing is one of them [5], in order to enhance the internal motivation of students to learn and cultivate talents with certain comprehensive application ability.

2.3 Integration of Knowledge Structure

According to the requirements of the "Innovative Action Plan for Artificial Intelligence in Colleges and Universities" issued by the Ministry of Education, teachers should promote the construction of new engineering disciplines as well as the multidisciplinary integration under the premise of ensuring scientific content [6]. Teachers should pay attention to the cross-integration of various disciplines, which can be practiced with students' majors. For example, when teachers teach students from economics and management major, they can combine the derivative of a function with the concept of margin in microeconomics, which is conducive to deepening the cognitive level of professional knowledge. In addition, teachers can implement stepped teaching to continuously improve the breadth and depth of knowledge, and knowledge points should go forward from easy to difficult. Teachers can appropriately increase the postgraduate entrance examination questions, lay a solid foundation for students who are interested in postgraduate entrance examination while laying emphasis on the basics, and cultivate talents with certain scientific research ability.

3 Teaching Concept

In terms of teaching concept, it is necessary to change from the traditional knowledge teaching as the center to the improvement of students' comprehensive quality as the center.

Teachers should adhere to student orientation, design reasonable teaching links, promote the teaching concept of OBE (outcome-based education), vigorously promote the principle of laying equal stress on imparting knowledge and thinking methods, and guide students to learn. They should pay attention to students' comprehension ability and learning ability, set usual grades, and better exercise students' self-expression ability.

Each subject has a subject representative and under the subject representative there is a group leader. Students hand over all kinds of homework to the group leader. After the group leader evaluates, he or she submits it to the subject representative. The subject representative evaluates the group leader's homework and summarizes it, and then sends it to the teacher for final review. The content of the usual grade setting is based on the basis of students' self-improvement, including the homework of each chapter, the duration and frequency of watching videos of related subjects, lectures, recorded practice assignments, short essays, etc. The way of obtaining is similar to the mode of exchange of supermarket points for gifts. In this process, it can not only consolidate the students' knowledge points, but also improve their communication skills and team coordination and combat skills. The main forms are:

3.1 Systematization of Professional Knowledge

Class assignment is an indispensable part of learning mathematics courses. Students consolidate what they have learned through chapter practice.

3.2 Modeling of Flipped Classroom

In the process of organizing lectures, teachers use the form of flipped classroom to first assign the content of the lectures to students, students will learn by themselves, and teachers will guide them at any time and finally move lectures into the classroom. Practice has proved that students who participate in the lecture can prepare carefully, which can not only deepen their understanding of knowledge points, but also exercise students' ability of expression and instant reaction, and can also stimulate the expressiveness of other students and improve their interest in learning.

3.3 Video Orientation of Practice Assignments

The flipped classroom has a relatively small audience. In order to allow more students to participate in the stage of showing themselves, teachers can leave students with multiple practical assignments, and each student is required to participate in the explanation in the form of group recording video, and the lecture place is not limited. Some students choose to be in empty classrooms, some use Tencent Meeting, and some are in the dormitories. There are scenes of lively lectures left everywhere, and good teaching results have been achieved. In the process of participating in the video recording, students greatly enhance their team coordination and communication skills.

3.4 Summative Small Essays

After one semester of courses, the knowledge points are scattered and not systematic. Through generalization and summarization, students intersperse knowledge points in the form of small essays, which can allow them to review and consolidate on the one hand, and improve students' logical thinking ability and writing ability on the other hand.

The usual grades are set based on an educational model tailored for students centered on student achievement, which can comprehensively improve students' professional

knowledge learning ability, language expression ability, communication ability, writing ability, team coordination ability and logical thinking ability, create for the society qualified builders and reliable successors of socialism with Chinese characteristics who have ideals, skills, and responsibilities and consolidate the foundation of comprehensive quality, so as to become pioneers and dedicators who are at the forefront of the times.

4 Teaching Model

The traditional teaching model should turn to online and offline blended education.

The modernization of education is closely linked with the development of the times. Teachers should respect the growth laws of contemporary college students and conform to their growth environment. As early as the International Congress on Mathematical Education held in 1988, this point of view was put forward: The most important task of post-secondary mathematics education is to make mathematics an attractive subject for students with a wide variety of interests and to make college mathematics a necessary preparation for many different careers. This requirement still holds true for contemporary college mathematics education. The content of college mathematics courses is relatively boring compared to other courses. Teachers should maximize students' interest in learning mathematics courses, always regard fostering character and civic virtue as the fundamental task of education, assist in teaching by connecting with the Internet, deliver videos of positive energy such as mathematics culture and biographies of great people, and play the important role of education in educating people's values. The teacher's teaching model also needs to change accordingly:

- Teachers can adopt online and offline blended learning model and strengthen the integration with information technology. They can combine Rain Classroom, Chinese University MOOC and other tools, mainly online and supplemented by offline, and gradually build a blended course with rich content and strong interaction. Mathematics courses generally have a large amount of classroom knowledge and a high degree of difficulty. After a class, many students have doubts, and the bullet screen function of Rain Classroom makes up for this very well. Students can send questions to the group at any time and solve them in the classroom. In addition, the playback function of Rain Classroom is also convenient for students to review anytime, anywhere. Also, teachers can use the resources of Chinese University MOOC to learn and discuss teaching videos related to the course, as a good supplement to the normal class, to expand the knowledge of students.
- Teachers can use guided, inquiry-based, flipped classroom, screen recording and other teaching methods to carry out teaching activities, combine with QQ and WeChat to solve various problems encountered by students at any time, and promote the continuous growth of students' interest in learning. In this process, what is needed is the teacher's love and patience. A little problem in a student's learning journey is like a grain of sand in a long-distance traveler's shoe. If the teacher doesn't find the crux of the problem with the students, the students will become more and more confused, and it is easy for students to have a smattering of knowledge during the later learning. Teachers can combine with WeChat, QQ and other software to remove

obstacles for students to move forward in time and better carry out the next step of learning. Practice has proved that the more questions teachers answer, the more students can be interested in learning.

5 Evaluation Method

The evaluation method should change from simplification to staging and diversification.

The evaluation system is also a very important part. Now in the era of knowledge explosion, there are many channels and sources for students to acquire knowledge and the teaching mode is becoming more and more diversified. A single final exam is no longer the only way to test students' learning effects, the evaluation methods have also changed, and more and more emphasis has been placed on process evaluation. This is mainly considered from the following two aspects:

- Teachers should improve the process evaluation, enrich the evaluation methods such as summary, inquiry, thesis, and report, and enhance students' sense of achievement.
- Teachers should encourage students to participate in various competitions, and the competition results can be converted into part of the usual grades to improve students' comprehensive application ability of knowledge points.

6 Conclusion

Based on learning, thinking, practicing and understanding, under the blended learning model, the author has continued to promote the course ideology and politics into the classroom, which has been carried out for 4 semesters and has achieved very good teaching results, being well received by peer teachers and students. This is a cyclical process of learning and thinking, thinking and practicing, practicing and understanding, and understanding and learning, which needs to be constantly polished and summarized in order to achieve better results. It is necessary to realize the systematization of professional knowledge, that is, to systematically master the knowledge structure of this course, but also to improve the comprehensive quality of students, that is, language expression ability, team coordination ability and logical thinking ability.

The introduction of course ideology and politics into the classroom is a teaching concept and a form of education, which carries the role of cultivating students' correct values, outlook on life and world outlook. The introduction of ideology and politics into the classroom of college mathematics courses is not only the need of education, but also the need of social talent training. To foster character and civic virtue, promote the ideological and political construction of college mathematics courses to deepen and practical, aim to cultivate applied talents as the goal of the three-dimensional integrated course construction of college mathematics basic courses, carry out ideological and political work throughout the whole process of education and teaching, and realize the whole process of education and all-round education, the important point is on the cultivation and innovation of students' knowledge, ability and humanistic quality, enhancing students' in-depth analysis and innovation ability, establishing feelings of loving the party, the country, the people, and socialism, and making efforts to cultivate socialist builders

and successors who combine knowledge and ability with a correct outlook on life, world outlook, and values.

Authors' Contributions. Ping Du was responsible for experimental design and wrote the manuscript. And Wei Liu, Xiaoyan Qiao, Lin Guo contributed to revising data.

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