

The present situation analysis and countermeasure research of mathematics probability statistics teaching under the new curriculum

Yuren Wang¹, Chengli Wang^{2*}

1. Beijing Normal University, Beijing 100875, China

2. Xihua University, Chengdu 610039, China

Abstract: With the development of social economy, the whole society needs more science and technology disciplines to provide high-quality talents, to ensure the production, life innovation and development needs. Mathematics as the basis of science and technology disciplines, almost any discipline is related to it, which prompted the education department and society to pay more and more attention to the reform of mathematics, and gradually implemented a number of curriculum reforms, in order to ensure that personnel training and market demand in line. Under the new curriculum, it is necessary to optimize and integrate mathematical probability and statistics from the level of statistics, re-plan the content of probability and statistics, show basic, advanced and practical characteristics in the setting of teaching content, strengthen the integration of theory and practice teaching, pay attention to the renewal of teaching ideas, and promote the diversification of teaching methods. In order to promote the improvement of the teaching quality of mathematics probability statistics and realize the all-round development of students.

Key words: New curriculum; Probability statistics; Teaching status; Countermeasures

Introduction: Based on historical reasons, probability statistics in our country has not been paid attention to in teaching for a long time, resulting in less research on probability statistics in various stages in the past, which restricts the improvement of mathematics teaching quality and affects the all-round development of students. In the social and economic development, under the development of information technology, big data, cloud computing, the Internet of Things, etc., make a lot of use of probability and statistics knowledge, which directly promotes China's economic development and also provides convenient services to people. Probability and statistics play an important role in social development, which can ensure students to form a systematic mathematical knowledge system. The implementation of probability statistics teaching reform is in line with the development trend of The Times and the requirement of personnel training, which is conducive to promoting the sustainable social and economic development of our country. However, there are still many problems in probability teaching, which affect the effectiveness of probability and statistics teaching and restrict the growth and development of students in our country. Therefore, under the new curriculum concept, we should change teachers' ideas, fully implement the teaching requirements of probability and statistics, promote students' all-round development, and promote social and economic development.

I. Analysis of the current teaching situation of mathematics probability statistics under the new curriculum

In the new curriculum reform, mathematical probability statistics in our country mainly presents four characteristics. First, the textbook content is old and lacks the atmosphere of The Times. From the analysis of the content of probability and statistics textbooks, many knowledge points are backward in the content setting or use methods, especially in the exercise design, which focuses on the elaboration or analysis of theoretical knowledge, has little combination with life practice, is weakly connected with students' life, does not reflect the latest scientific and technological achievements, and lacks interesting content, resulting in probability and statistics being boring and not attractive to students. Second, focus on the conclusion, the lack of thinking exploration. In the application of the exploration thinking of probability and statistics, there is no awareness of the contingencies of random thinking, and more realistic cases are used to give students direct experience, without allowing them to experience the process of knowledge formation. The teaching class is simple, and students' questioning and thinking exploration are not paid attention to, which restricts the development of students' thinking. Third, it neglects the application of background and lacks application space. In developed countries, the contents of mathematics textbooks are often presented in the form of reading materials. Such materials are rich in content and diversified in forms, and can also be illustrated in a vivid way to present the problems. Some are the application of mathematical history, some contain profound truth behind, some are unknown exploration problems, and some are the development results of modern mathematics. However, in our mathematics teaching materials, there is no deep connection with real life, nor does it reflect the origin of mathematics, and more is the presentation of abstract knowledge. Basically, the embodiment of most mathematical knowledge is the application of mechanized methods to theories to deal with some manually set problems, which is far from the practical problems. Fourth, the lack of cultural atmosphere, the application of information technology is not high. From the analysis of the new curriculum materials implemented at the present stage, the cultural atmosphere is still not deeply integrated, and the cultural value of mathematics and the cultivation of students' humanistic spirit are not paid attention to. Moreover, it does not pay enough attention to the trend of social development and does not use information technology in depth, which restricts the improvement of mathematics teaching quality and hinders the all-round development of students.

II. The teaching strategy of mathematics probability statistics under the new curriculum

1. Strengthen statistical thinking and change thinking cognition

In probability statistics, the overall situation is speculated through sample data, reflecting the random characteristics of probability statistics. However, the results obtained by probability statistics are not necessarily accurate, and may also be wrong, which is related to the preconditions of statistics and is affected by statistical thinking. Statistical thinking is very important in mathematics, can have an impact on deterministic thinking, and the process of implementing statistical reasoning through undetermined data is also a way to get effective conclusions. This is from the nature, life practice, there are a lot of random events, overview statistics can describe their changes, can help people get a relatively correct answer, can also find the probability of error.

In probability statistics, statistical thinking is one of the core contents. Teachers should attach importance to the training of statistical thinking in teaching, and let students find out the opportunities to provide reliable opinions in data analysis, so that students can experience the practical role of probability and statistics in life, and understand the difference between statistics and deterministic thinking. At the same time, it should also be recognized that if the statistical method chosen is scientific and reasonable, it is very suitable for the data, can make a more accurate response to the overall data, and can provide reasonable suggestions for people who use the data. Therefore, in the study of probability statistics, teachers should strengthen the training of probability thinking, which is an effective way for students to improve the quality of probability statistics students. No matter what the probability and statistics phenomenon, students must master the statistical thinking, in order to carry out a correct analysis of it, help to improve students' thinking understanding.

2. Improve the application ability with the help of life cases

In the teaching of probability statistics, the corresponding life cases should be adopted. Through the analysis of specific problems, students can understand the whole process of statistical data processing. In this process, students can master the method of data processing, but also can effectively apply the knowledge of probability and statistics, gradually master the way of dealing with practical problems, and improve the application ability of students' statistical knowledge. In addition, in the use of real life cases, students can see the temptation phenomenon reflected in the essence of knowledge.

In the new curriculum, teachers are also required to design statistical cases. Students can enhance their sensitivity to data, realize the random characteristics of probability and statistics, realize the wide application of statistical methods, and improve their ability to apply statistical knowledge. In the selection of statistical cases, the degree of mastery of theoretical knowledge can not be designed, so as to avoid students memorizing knowledge points. Therefore, in the teaching of probability statistics, teachers should realize that there are a lot of statistical content in real life, which requires active collection of life materials and integration of knowledge of other disciplines, so as to help students take the initiative to solve practical problems, and enable teachers to actively carry out case teaching, promote the wide use of statistical methods, and effectively enhance students' learning interest. So that students can have a deeper understanding of knowledge points.

3. Attach importance to information acquisition and enhance data analysis capabilities

In probability and statistics, there is a clear teaching goal, which requires students to master the ability to acquire data information. After processing the data of practical problems, students can find out the existing problems or trends by using statistical methods to visually present the phenomena. For example, in the new course, students are required to present the processed content through stem and leaf diagrams. In this case, the graph is composed of data, which can reflect the intuitionality and will not lose the data. The application process is very simple. This graph can be very good for a small amount of data, but it is not suitable for more data. Once you have a lot of data, the stem and leaf graph is basically useless. Therefore, in the use of stem and leaf diagram, students should be encouraged and supported to find out the key information from the graph and find out the law or trend of data distribution, so that probability and statistics can not only be reflected by simple operations, nor drawing, but more importantly, data extraction.

4. Attach importance to random phenomena and understand the significance of probability

In probability statistics, probability focuses on the study of random phenomena. It can be seen from the definition of the theory that random phenomena will not produce consistent results, and it is impossible to predict the results. Basically, it is impossible to find a rule and cannot be predicted. In the teaching of probability, the teaching goal is to let students understand this phenomenon and realize the value of probability in life. If students do not feel a lot of random phenomena, they often have no understanding of random phenomena. As a result, in teaching, students may think that the data processing process is the application of certainty, and fail to form an awareness of random ideas. To ensure the formation of students' random thinking, teaching cases should be reasonably selected, students' interest should be stimulated, and students should collect and analyze the data in the experimental process through their own participation, so as to promote the formation of random thinking. In addition, through enough experiments, students will have a higher understanding of random phenomena. This requires that in the teaching, we should choose the cases of life and let students do experiments on their own to enhance their understanding.

Teachers should attach importance to random phenomena, through the introduction of life cases, closely combined with students' life experience, so that students can clarify the meaning of random phenomena in the exploration of practical problems, and realize the value of probability and statistics in real life. Teachers can also design simulation methods for learning to enhance students' understanding of probability and statistics. This method is very important for students to learn probability statistics, and it is also a very suitable way for probability statistics teaching. In reality, there are many real cases that cannot be carried out in practice for various reasons, but solutions or suggestions can be found by means of simulation.

5. Strengthen the use of information technology to reduce the difficulty of simulation

With the development of science and technology, all kinds of information technology have been widely used in the field of education. The use of information technology to process data faster can also change students' understanding of probability and statistics, so as to improve the teaching effect. The function of computer makes the students to simplify and facilitate the complicated data calculation process, and improves the data processing effect. In the aspects of data recording and analysis, it has found more convenient tools for students, so that students have more time to study realistic cases, and constantly enhance their understanding of probability and statistics. In the analysis of probability phenomena in real life, students can get a lot of simulation data by using computer tools, which can guarantee the accuracy of probability results. Therefore, in probability and statistics teaching, teachers should increase the use of information technology, so that students can gradually master the use of computers, which is conducive to improving the quality of teaching.

Concluding Remarks

In the teaching reform, the implementation of the new curriculum is an effective reflection of the social development trend and has a significant impact on mathematical probability and statistics. On the one hand, after the formation of the market economy system, the formation of the global economy, the comprehensive national strength of countries is fierce competition, all through improving the innovation strength, change the competitive relationship, which needs a large number of high-tech talents, among which mathematics is the basic discipline to train such talents; On the other hand, the transformation of human life and production also needs mathematics as a basis. Therefore, teachers should pay attention to the requirements of the new curriculum reform, gradually adjust and optimize the teaching of probability statistics, comprehensively improve students' probabilistic thinking, and promote the improvement of teaching quality.

References

- [1] Gang Li. Research on Stochastic System Exploration Road to Serve the Country -- Wang Liang, doctoral Supervisor of School of Mathematics and Statistics, Northwestern Polytechnical University [J]. *Scientific Chinese*,2022(05):54-55.
- [2] Lijuan Shi. Research on Probability and Statistics Teaching Practice in Higher Vocational Colleges Based on Ability Development-taking "Normal Distribution" as an example [J]. *Knowledge Library*,2022(02):115-117.
- [3] Guanghui Li,Jusong Song,Yushan Wang. Statistical Analysis on the Use of Teaching Platform of Probability and Statistics Course -- A case study of Kaili University [J]. *Journal of Kaili University*, 201,39(06):112-119.
- [4] Changyi Huang,Fuzong Bai. Constructing Visual Charts to optimize mathematical thinking -- An example of the application of constructing charts in solving probability and statistics problems [J]. *Middle School Mathematics Teaching*,2021(05):42-44.
- [5] Youyi He,Xia Li. Re-creation in the classroom: Design and Thinking of teaching fragments of Probability and Statistics course under Problem-driven [J]. *Educational Review*, 21,10(33):118-121.
- [6] Longzhu Chen. Teaching Inquiry of Mathematical Modeling in Senior high school -- Taking Probability and Statistics teaching Content as an example [J]. *Journal of Fujian University of Education*,2021,22(06):22-24.