Relevant Analysis on the Achievements of Students Majoring in Mathematics Education in Colleges and Universities

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Abstract: Mathematics education in Colleges and universities is of great significance in students 'innovative thinking. Among them, one of the criteria for assessment is students 'performance. But at the present stage, there are still some differences in the performance of students majoring in mathematics education in Colleges and universities. It is urgent to analyze these differences and give specific suggestions. For this reason, this paper first analyses the definition and calculation method of correlation, then explores the correlation of students 'achievements in mathematics education in Colleges and universities, and finally gives specific suggestions, in order to provide some ideas for the teaching of mathematics education in Colleges and universities.

1. Research Background

1.1 Literature review

College mathematics, as an important subject, is of great significance to improve students'learning thinking. In the existing research literature, scholars mainly study the relevance of mathematics education major in Colleges and universities. Some scholars have analyzed the correlation between the current students'grades based on the data of students' scores in some universities. The study finds that facts and data are used to reflect the relevance of University Students'performance, and suggests that university courses should be set reasonably to meet the learning needs of different stages (Zhang W.Y., et al, 2007). In order to evaluate the influencing factors of college students'performance, some scholars analyzed the characteristics of the current examination mode, and then put forward the problems they faced. At the same time, according to the situation faced by university teaching and its own characteristics, the author puts forward a specific evaluation model, and finally gives a specific implementation plan (Zhu Z.B., et al, 2013). Some scholars have pointed out that college students are influenced by family, social, personal and school factors, which have a direct impact on their academic performance (Xu Y.D., 2016). Therefore, different students have their own feelings about different factors. Based on this, the author uses cluster analysis method to extract three typical representative factors from potential influencing factors. Research and analysis found that there are differences among factors at the individual, social and school levels. The influencing factors at family level are relatively independent. At the same time, through the sample data of college students'grades, we can find that the regression analysis method has different effects on the sample students' grades (Diao C.H., 2010). Some scholars have pointed out that although students of different grades have different influencing factors, such as freshman's anxiety and sophomore's thirst for knowledge. But at the same time, the mathematics scores of students at both levels will be affected by the foreground concern factor. Mathematics is widely known for its rigorous logic and high Abstraction (Zhang J.O., and Li G.A., 2002). At the same time, in all subjects, mathematics is also the most basic one. In real life, many students have a negative impression on the number of students. They feel that the course of the number of students is very monotonous, resulting in conflicting psychology. Some scholars have pointed out that the purpose of mathematics education is to stimulate their interest in Mathematics in essence, thereby increasing their innovative ability (Chen C.D., and Niu J.R., 2017). In addition, mathematical aesthetics can also drive students to think about mathematical thinking, which is an important part of creative thinking. Therefore, from the above reasons, it is of positive

significance to penetrate the achievements of mathematics and to analyze the specific relevance.

1.2 Purposes of research

In the process of mathematics teaching in Colleges and universities, learning activities are the result of the interaction of internal and external factors. In this case, there will be great differences in college students'math scores, but the performance of these differences, as well as the influencing factors, need to be studied in detail. In the existing research, through data mining analysis and statistical methods, we can reasonably extract the related factors of University Students'academic performance, so as to provide reasonable suggestions for professional construction. In order to validate the above methods effectively, this paper also needs to make a scientific and quantitative comprehensive evaluation of College Students'mathematics achievements, in order to mobilize the enthusiasm of mathematics teachers, so as to improve the quality of teaching.

2. Relevant Theory Analysis

2.1 The connotation of relevant relations

In order to study the correlation degree of two or more variables, we need to call a certain function to express the relationship between phenomena. This method is correlation analysis. Generally speaking, the relationship between phenomena can be divided into two types: correlation and function. Relevance relation refers to the stochastic relation of two phenomena with uncertain numerical value, and is the object of studying correlation analysis. Functional relationship is the interdependent relationship among variables, and it is a tool for correlation analysis (Shen C, 2017). From the specific situation, the functional relationship in the correlation is a special case, while the correlation is incomplete. The value of the correlation is not fixed, but to some extent, it can show that the value of the specific relationship is not fixed. Therefore, according to the analysis of correlation, it can be divided into three categories: complete, incomplete and unrelated. According to the number of research variables, it can be divided into single correlation, multiple correlation and partial correlation (Qian L. K, 2017).

2.2 Definition and calculation method of correlation coefficient

In order to illustrate the degree of closeness of linear correlation conditions between variables, it is necessary to use direction statistical analysis index. Specific defining formulas are as follows:

$$r = \frac{\frac{\Sigma(x - \bar{x})(y - \bar{y})}{n}}{\sqrt{\frac{\Sigma(x - \bar{x})^2}{n}}\sqrt{\frac{\Sigma(y - \bar{y})^2}{n}}}$$

In the formula, n is the number of data items, X and y are independent and dependent variables, and R is between [-1,+1]. In the specific calculation, the degree of correlation is different from the unit of measurement, and has nothing to do with it. Therefore, in order to eliminate the influence of the original measurement factors of variables, it is necessary to divide the variance of variables by the standard deviation of the sequence of variables. At this time, we can proceed to the next step. According to the correlation coefficient, the concrete simplified formula is obtained, and the correlation coefficient is calculated with the specific Excel or professional SPSS software.

Next, we should pay attention to the correlation degree and correlation coefficient. Generally speaking, correlation coefficients can be understood from two aspects: positive and negative symbols and absolute values. Positive and negative states how they relate, and absolute values indicate how close they are linearly. If the following conditions occur, then their correlation coefficient relationship can be understood.

Firstly, if R is positive, then it is a completely positive correlation, if it is negative, then it is a completely negative correlation. Next, if R is zero, then the variables have nothing to do with each other.

Secondly, if the absolute value of R is close to 1, it means that the linear relationship is closer and R is close to 0, then the linear density will be reduced. According to the critical value table of correlation coefficient, when n satisfies the value between 40 and 60, the given significant level a is 0.05, which can be identified as | R | < 0.33, which is an infinite correlation; | R | > 0.33, then there will be a significant relationship; if | R | ⩾ 0.66, then this relationship is called highly linear correlation.

3. Relevant Analysis on the Achievements of Students Majoring in Mathematics Education in Colleges and Universities

In order to effectively improve students'academic performance in mathematics, it is necessary to develop characteristic courses, and relevant teaching courses should be taught in accordance with their aptitude. In this case, the analysis of students'performance can provide valuable data reference for students.

3.1 Relevant analysis of the same type of courses

The core goal of educational curriculum is to cultivate teachers 'teaching skills. At present, the professional category of mathematics teachers in Colleges and universities belongs to the most basic activities. In order to analyze the correlation coefficient between courses, this paper needs to build professional basic courses, educational psychology, and other types of curriculum related situation. According to the research, the coefficients of professional courses and psychology courses are relatively large, while the correlation coefficients of a few courses are relatively small, which indicates that there is a strong significance between the same types of courses. Further analysis shows that there is a positive correlation between College Mathematics and college entrance examination results. This shows that the theoretical courses of college students are basically affected by the examination results. Generally speaking, theoretical achievements can reflect students'IQ, attitude, habits and other aspects, and play an important role in students' performance. In order to effectively improve the quality of students, we should not only pay attention to vocational education, but also pay attention to the study of theoretical courses. From the current situation, there is an inevitable link between the professional courses offered by mathematics majors in Colleges and universities and other courses.

3.2 Relevant analysis of different types of courses

It can be seen from the existing literature that there are great differences between different types of curriculum disciplines and teaching methods, and the correlation between them will also have different effects. Based on the analysis of the existing data, it is found that the R value between the courses of Mathematics Education Specialty in Colleges and universities is close to 0.7, especially the correlation between higher mathematics and English courses of education specialty is weak. From this we can see that public basic courses are different from other courses. Only by constantly strengthening the study and guidance of public courses can teachers'education play a broad professional role in training.

3.3 An analysis of the achievements of mathematics education major courses in colleges and universities

According to the current situation of development, the students majoring in mathematics education in Colleges and universities have achieved better results in all subjects. Although some of the students'performance in single subject is outstanding, and some of the students' performance is relatively poor, the differences between them still exist and have a certain positive correlation. In this context, the analysis of the correlation between the results of various disciplines can reveal the irrelevant or negative correlation between some courses. Therefore, based on these results, we can judge the exam, course learning quality and specific learning methods of mathematics majors in Colleges and universities. Here is a case to illustrate. In the analysis of a class's course performance, the correlation between course A and other courses is negative, while the correlation between course

B and other courses is relatively low. Through our investigation and interviews, as well as searching for information, we found that the data of course A and the score book are not consistent, which belongs to the situation of incorrect entry. Course B belongs to the situation that teachers go out temporarily and are graded by substitute teachers at will.

4. New Thoughts on Teaching Improvement of Mathematics Education Major in Colleges and Universities

Mathematical quantitative analysis method provides accurate data for this experiment, and provides effective help for effectively promoting the accuracy of mathematics teaching and research in Colleges and universities. Through the analysis of the correlation of the current students'scores, the current curriculum of mathematics education in Colleges and universities needs to do the following improvements.

4.1 Pay attention to the teaching of theoretical courses and cultivate students'lifelong learning ability

The study of theoretical courses can effectively reflect the basic quality of College students. At the same time, their achievements can take into account the development of students 'morality and intelligence, and can comprehensively improve the quality of students. Therefore, the major of mathematics education in Colleges and universities should pay attention to the teaching of students 'theoretical courses. Firstly, we should build a perfect teaching mechanism of basic courses. According to mathematics "space and graphics", "statistics and probability" and "comprehensive application of practice" and other fields, students 'learning ability is constantly arranged. On this basis, it teaches students how to deal with the contradiction between basic and professional development, and clears up the relationship between professional courses and teachers 'abilities. To cultivate teachers 'teaching ability, we should build professional knowledge of mathematics and fully embody the characteristics of education. In addition, the teaching of mathematics in Colleges and universities needs to incorporate public basic courses into the teaching system so that students can fully learn all kinds of knowledge.

4.2 Modifying the skills course system to create mathematics teaching skills

Through relevant analysis, it is found that many skills courses are not related to mathematics teaching skills, which makes it difficult for many students to get systematic training. Therefore, in order to effectively solve such problems, enable students to fully recognize skills and knowledge, and then highlight their strengths and develop them, it is necessary to optimize the existing skills curriculum system. On the one hand, college mathematics education specialty should constantly strengthen teachers'teaching professional ability, and properly reflect the theoretical and practical activities of mathematics. For example, through operational planning, mathematical modeling, and mathematical competition and activity guidance, students'cognitive ability can be improved. In addition, the mathematical skills of university mathematics teachers are based on knowledge ability, teaching theory and teaching activities. It is necessary for mathematics teachers to learn and cultivate enough teaching skills.

4.3 Integrating mathematics education courses to strengthen students'learning enthusiasm

The management of mathematics education in Colleges and universities should consider the correlation between curriculum independence and training objectives, so as to strengthen students'enthusiasm in learning mathematics. While thinking about how to embody the role of mathematics curriculum, it is necessary to add the difficulty of curriculum. By integrating the complementary courses, we can improve the teaching efficiency and quality, and give full play to the value of auxiliary courses. For example, computer basic application cooperates with the production of multimedia courseware of mathematics to improve students'ability of multi-course application; the integration of education history and mathematics history teaching can improve students' comprehensive understanding of mathematics curriculum. At the same time, the same type

of mathematics curriculum needs to be fully integrated. At present, mathematics education majors not only offer higher algebra and analytic geometry, but also need to add other courses about mathematical types. In this way, we will increase the content of modern mathematics and create disciplines such as discrete mathematics and applied statistics.

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