

Use Computer to Promote the Classroom Revolution of “Error Theory and Measurement Adjustment Foundation” Promote the Classroom Revolution of “Error Theory and Measurement Adjustment Foundation” by Effective Teaching

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Abstract: Higher vocational education emphasizes the practical ability, students have a natural fear of formula derivation and a lot of calculation, but in the teaching is not around the past content, must pay attention to the effectiveness of teaching. This paper discusses on the error theory and the measurement adjustment of basic teaching, according to the characteristics of higher vocational students based on the students to master the tools, combined with teaching practice, using modern computing information within reach for everyone, in order to EXCEL, and MatLab as the basic computational tools, dilution formula derivation, strengthen results, complete “can see and touch” complex calculations, let students gain confidence in a large number of verification calculation, eliminate fear, make the teaching get unexpected results.

Keywords: Three whole education; Measurement adjustment; Effective teaching; Classroom revolution

1. Introduction

The implementation of General Secretary put forward “what kind of people to train, how to train people and for whom to train people” requirements, to achieve this to grave needs to have a specific analysis of the problem, need to have practical ideas and practical measures. The status quo of low-efficiency classroom has seriously deviated from the high quality requirements of the development of higher vocational education, which also presents the most realistic reform topic for higher vocational teachers to carry out classroom revolution. Classroom revolution is to solve the problem of invalid classroom with practical measures. The reform needs to carefully analyze the current situation of students, form rules according to knowledge and skills, use the methods and efficient tools suitable for the teaching objects, and put them into practice in the classroom, so as to achieve unexpected practical results.^[1]

2. The main battlefield of “three whole education” is in the course education, we must do a good job in diagnosis and analysis, and determine the appropriate method and path

The Ministry of Education clearly points out in the work requirements of “Three Whole Cultivation”: “As the starting point of all the school work to promote students’ development”, “comprehensive reform of college and department level to adhere to the teachers and students as the center, the understanding of the characteristics and development needs of teachers and students to optimize the supply, improve work method, carrier innovation work, overall plan as a whole school administration in various areas, education teaching each link, in all aspects of the talent training education resources and man power, give full play to the curriculum, scientific research, practice and culture, network, psychology, management, service, financing and organization work of the education function, build three whole education integration work system” “top 10 education concrete will be implemented to the school work and each link, To every faculty member “. According to this requirement, curriculum education ranks first in the “ten education” system.

The course “Theory of Errors and Fundamentals of Measurement Adjustment” is very practical in itself. However, due to the influence of the writing style and content of the existing teaching materials, the course with very strong practicality is turned into a purely theoretical course in the actual teaching. In all kinds of textbooks of this course, most of them devote a great deal of space to formula derivation, and teachers often talk about formulas in teaching. As a result, students are very painful, so most of them choose to give up. The teacher feedback and complained that the students poor foundation, bad learning habits, math knowledge and so on.^[2] Objectively, we should recognize that this is the current situation of students, and carefully study how to design our teaching based on such teaching objects, so that students can more easily learn and master the content we want to teach, and achieve the teaching purpose. Instead of expecting students to be what we want them to be, we’ll teach them.

The course of measurement adjustment involves important mathematical knowledge, including advanced mathematics, linear algebra, probability theory and mathematical statistics, etc., and the specific important knowledge points are permutation and combination, random events and their probability, mathematical expectation, probability distribution, probability density, matrix

operation, conditional extreme value, etc. It is unrealistic to require higher vocational students to systematically study advanced mathematics, linear algebra, probability theory and mathematical statistics. Settle for second best, how to let the students can also be a lot easier to learn and use the above a few points, and learn to use modern tools to complete the corresponding adjustment calculation, solve basic problems in measurement, really implement “according to their aptitude”, not “material” for teaching, that is measuring adjustment course will focus on the problem that cannot be separated from the teaching object, teaching problems.^[3]

3. Initiate effective learning activities based on Excel training

For simple calculations, students can use a mobile calculator to complete, for a large amount of calculation, the use of Excel tools for calculation, the basic use of this tool is mastered by students. Although Excel can carry out complex operations, including measurement adjustment programming calculation, it is unrealistic for vocational college students to write complex programs at the beginning. Based on the foundation of students, it is very useful to use Excel to carry out simple and large amount of calculation. Students can easily master the calculation of correction, variance, median error, covariance, etc., and it is very helpful to understand these concepts through practical calculation. How sophisticated formulas and theories seem, calculation can be easily completed in Excel.^[4]40, for example, to compute the two groups have observed value of the mean, variance and covariance data in the table input observation group A series of L (40), and it is easy to get the average M, calculation of correction (each observation value and average value), then calculate (correct number square), calculated again, the next step is easy to get the variance of data.

The observation series of group B is also calculated. It is easy to calculate the covariance of group A and B with their respective corrections. Students only need to input the observation quantity and get the desired result through simple operation.

Students use Excel to verify the calculation examples in the textbook. When the calculated results are consistent with those in the textbook, students will get unprecedented achievements and greatly improve their learning confidence. For similar data calculations, it is easy for them to understand the actual significance of values such as variance, median error and covariance by using their own actual observed values, and to understand the significance of results changes in data changes.

4. Solve complex problems with Matlab and lead learning activities into depth

In the practice of measurement work, the least square principle is generally used to calculate the adjustment for the observed data. The teaching of measurement adjustment course mainly teaches the classical method of measurement adjustment, including four adjustment function models: conditional adjustment, conditional adjustment with parameters, indirect adjustment and indirect adjustment with constraints. For different adjustment models, conditional adjustment is easy to understand, students can master the list of conditional equations, but it is unrealistic to require students to carry out the whole process of adjustment calculation according to the least square method. Therefore, with the help of Matlab matrix operation function, students can easily complete the calculation and get the adjustment results. In matrix operation, directly input the sequence of matrix elements, supplemented by simple statements, you can realize the matrix sum, difference, multiplication operation, matrix transpose operation, matrix inverse operation, matrix general inverse operation.^[5]

5. Conclusion

Advance “revolution” class, must according to the external demand of higher vocational education, condition change, the foundation of the students, and so on and so forth, each lesson will provide rich optimization space for teachers, teachers on the basis of understand the teaching content, teaching material system limit, based on the perspective of students to arrange each lesson, teachers and students can give prize. School on rankings, project, declaration, such as field demonstration, backbone, high-quality work, should focus on more happen every day, involving thousands of teachers and students class level, the classroom is khalid ents in the forefront of the the most dynamic and innovative, events happen every day change students status, for a limited time, highlight the practical validation, enhance interest in learning, to build confidence, the significance of this is the advance class revolution.

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