Universe Scientific Publishing

ORIGINAL ARTICLE

Analysis of Problems and Countermeasures of Experimental Teaching Mode and Personnel Training of Mineral Processing Specialty in Colleges and Universities

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Abstract: Mineral processing as a typical engineering major, experimental teaching is the most important part of professional training. Based on its long-term teaching experience and the development trend and social demand of this specialty, this paper analyzes the problems of mineral processing specialty in experimental teaching and talent training from many aspects. And put forward the countermeasure, in order to be able to train the talents of mineral processing, who have the solid basic, strong ability, wide employment caliber and the high overall quality, better satisfies the present related enterprise and the society development, the construction demand.

Keywords: The Specialty of Mineral Processing; Experimental Teaching; Talent Training

Mineral processing is an important part of modern industry, this major mainly studies useful minerals,separation of gangue mineral and other issues, according to the different physical and chemical properties of different minerals in the work, through re-separation, magnetic separation, flotation methods to achieve mineral separation, for subsequent ore enrichment, smelting rich and other work services. It can be seen that this major needs strong practical ability, hard work and contains many practical methods, so it is necessary to strengthen experimental teaching in order to make students understand and learn various practical methods more clearly, and to strengthen their practical ability and psychological quality through experimental exercises. However, the mineral processing professionals trained and transported in our country every year are very limited, the gap with the related work is very large, and the quality of talents does not match with the social needs. The national policy bias, the allocation of educational funds and the degree of attention to this major in schools are also unfavorable to the training of mining processing talents, so this major needs to actively explore and innovate experimental teaching methods and talent training models.

1. Problems in experimental teaching of mineral processing in colleges and universities

1.1 Traditional ideas, insufficient experiments

Because of the characteristics of mineral processing teaching, we need to attach great importance to experimental teaching. At present, enterprises have a very high demand for engineering professionals, not only to have a comprehensive and solid theoretical foundation, but also to be able to work independently, unwilling to train talents too much and for too long. Therefore, the talent cultivated under the traditional concept of education is far from the current employment demand.

At present, the few colleges that offer this major, the teaching management and related methods have not been developed in the past, and the traditional management is still generally reflected in the experimental teaching of this major. It is considered that experimental teaching is the supplement and auxiliary means of theoretical teaching, with less courses and less credit, teachers and students pay less attention to experimental teaching and schools, the experimental content is out of touch with practical work, and teaching is mostly formalism.

1.2 Old content, traditional methods

Because of the aging of teaching ideas and the lack of attention to experiments, the contents and methods of experimental teaching have not been effectively updated, the contents are rigid, and the teaching methods are too traditional. The experiment retells the theory knowledge more, does not combine the actual case to carry on, the student actual operation, the synthesis ability all can not get the training.

doi: 10.18686/ahe.v4i5.2245

The development of mining industry has changed the work content, such as economic accounting, material experiment and equipment operation of commonly used minerals more appear in the actual work, and the experimental course lacks these contents.

Experimental teaching is still based on teacher indoctrination, even if there is a cooperative group, but the lack of integration with the case discussion and other methods, as a result, students are still mechanically following the teacher's original version to carry out the experiment, students' thinking and innovation ability can not be improved.

1.3 Lack of facilities and incomplete experiments

Mineral processing experiments have a high dependence on experimental platforms, instruments and equipment, and the undergraduate schools that set up this major have basically set up laboratories, but because of the decline in enrollment, insufficient investment, no attention and other reasons, the number of equipment is small, some instruments can not be updated in time and so on.

In theory teaching, multimedia equipment has been used frequently to teach in the form of Mu-class, micro class and flipping class, but the development of practical teaching platform and equipment is slow, and the teaching mode of experiment about heavy magnetic floating specialty is traditional, the lack of equipment to adopt new technology causes students to be unable to master advanced equipment operation technology. Lack of equipment has also led to many experiments that can not be effectively arranged and carried out. Many experiments can only be carried out scattered, in this experimental environment students' interest, enthusiasm will be reduced accordingly.

1.4 Low effectiveness, single target

Many work in the mining industry is in the process of intelligent upgrading, automation of mineral processing equipment, intelligence, data management and other work tend to information. But in the experimental teaching of mineral processing specialty, there is a lack of frontier practical content, even if the experimental effect is good, it can not train the talents who can operate the automatic ore dressing equipment effectively, and the experimental effect does not meet the requirements of the times, so the actual experimental effect is still low.

In addition, engineering majors have a broad employment trend, mineral processing students are no longer limited to traditional mining and other fields of employment, in reality, many students in mining related fields, even cross-professional employment, self-employment. This requires students' consciousness and ability of practice, thinking and so on, and many experiments have a single purpose, pay too much attention to the experiment itself, and lack the cultivation of students' innovative thinking and problem-solving ability, which leads to the students being unable to start their career healthily under the huge industry competition.

2. Countermeasures for optimizing experimental teaching in mineral processing specialty

2.1 Optimizing concept, scientific planning

Colleges and universities should set up the scientific research team of this major, on the basis of effective understanding of the new engineering concept, deeply understand the actual needs of the relevant enterprises at present, and scientifically formulate professional planning, training objectives and experimental teaching objectives and contents according to the differences in the number and quality of talents, so as to realize the transformation of the whole process teaching concept and provide a better external atmosphere for students' professional learning. In addition, according to their own curriculum bias, increase the corresponding proportion of experimental teaching, increase class hours, improve credit, so that teachers and students pay more attention to experimental learning.

2.2 Select content and strengthen practice

According to the orientation of mineral processing specialty and the trend of industry, select the high-quality experimental content, follow the principle of strengthening foundation, strengthening synthesis and emphasizing application as far as possible, that is, on the basis of consolidating theory, we should introduce more scientific research topics and case resources, and make students more willing to practice through comprehensive open experiments. In addition, experimental teaching should strengthen the practical teaching of modern mechanical operation, so that students can understand and learn the frontier knowledge such as automation and intelligence of the subject.

2.3 Speed up construction and innovate methods

Invest more funds to improve the experimental platform, update the equipment and equipment, as many students as possible personally contact the frontier of the field of experimental knowledge, stimulate their enthusiasm and enthusiasm for exploration. First of all, the experiment can try to enrich the content of the experiment, integrate some basic experiments, increase the mineral density, hardness, friction angle and other characteristics of the experiment, so that students know more clearly and deeply about different minerals;

Secondly, we should innovate experimental methods, such as setting up special experiments, students choose experimental projects independently according to their career planning and interest, teachers only need to give a wide range of guidance in the experiment, and guide students to independently complete the experimental scheme design, instrument selection, practical operation and result analysis, so that they can improve their practical ability, analytical ability and thinking, innovative quality in the whole experiment.

2.4 Improve the system and optimize the management

The laboratory of mineral processing specialty not only provides the experimental place for students, but also is an important place for

teachers and students to carry out scientific and technological innovation, scientific research experiment and social service. It has great positive significance for the construction of college specialty. Therefore, it is necessary to establish a perfect and scientific laboratory system to ensure the operation and storage safety of the equipment. First of all, mineral processing laboratory, it is necessary to formulate experimental regulations, management system, laboratory safety management regulations and other systems to ensure that teachers and students, managers of the operation, management behavior has a system to follow. Secondly, we should do a good job in the management of laboratory personnel, instruments and equipment, experimental supplies, and make clear the management objects, tasks and specific management contents and methods of each administrator, and system responsibility system, supervision system and reward and punishment content, so as to enhance the standardization and effectiveness of laboratory management.

3. Strategies for improving the effectiveness of experimental teaching and personnel training in mineral processing in colleges and universities

To improve the quality of laboratory teaching in mineral processing specialty, it is not only necessary to optimize the experimental contents, methods and other directly related contents, but also to start with optimizing the overall training plan of the specialty and optimize the teaching mode and system of the specialty, which is also the premise to ensure the effective reform of experimental teaching and not rebound.

3.1 Optimize objectives and add courses

This major should increase the goal of personnel training, such as wide employment caliber and strong application ability, so as to optimize the curriculum system and content based on this. In basic science, we should strengthen the teaching of natural science and computer in order to improve students' ability of information operation and calculation and analysis, and the relevant laws and sociology are also indispensable industry knowledge for mining processing talents. In addition, in order to improve the students' professional cross-integration ability and skill operation level, we should increase the courses of investment analysis, automation and so on while strengthening the practical teaching, so that the students can learn the relevant knowledge of the industry more comprehensively.

3.2 Flexible admissions and enhanced guidance

Enrollment and professional guidance is an important part of professional construction. First of all, it is necessary to increase publicity on the frontier development of the mining industry, so that more high school students and parents can better understand the mining industry and related majors today, and encourage high-quality students to choose this major through the form of teachers' field enrollment; Colleges and universities themselves can build relevant graduate majors, encourage students to have the licenciatura, improve the number and quality of students in this major, but also beneficial to the mining processing as a fine specialty, forming a positive cycle of professional development model. In addition, from the beginning of enrollment, it is necessary to strengthen the work of career planning and employment guidance, so as to help students to understand themselves more clearly and rationally, the study and career development of the major, to provide the direction for their study and practice, and to provide the efficiency and purpose of their learning progress.

3.3 Strengthening teachers and improving innovation

It is very important for teachers to guide and organize in the teaching links such as experiment. We should improve the ability of teachers in each link of theory and experiment, supplement the number of teachers through recruitment, optimize the structure of teachers, ensure the effective development of teaching such as experiment, and improve the level of existing teachers through online training, school-enterprise communication, etc. Secondly, we should pay attention to strengthening teachers' practical and innovative ability, and urge them to bring teachers' teams and students to make effective use of experimental resources, carry out more scientific and technological innovation, research, competition, and create a frontier and positive atmosphere for professional training.

4. Conclusion

To sum up, experimental teaching is an important way to cultivate talents' practical ability and create thinking. Because of the limited experimental resources, the mineral processing specialty not only has many problems in the experimental teaching, but also has the deficiency in the specialized curriculum setting, which is not conducive to the cultivation of high-quality talents who meet the standards of the contemporary industry, Therefore, it is urgent for this major to carry out all-round and whole-process teaching reform, construct a better model of talent training and experimental teaching, solve the current situation of talent shortage in related industries, and help the development of mineral processing field better.

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