

Exploration and Practice of Innovative Practice Activities in Military Engineering Colleges

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Abstract: Innovative practice activities have a good effect in the training of innovative talents of engineering technology. However, military engineering colleges not only develop late in this respect, but also face many problems. Through comparative analysis, the prominent problems faced by military engineering colleges in innovative practice activities are obtained, and a new model of "one position, three bastions" is put forward. The new model has been put into practice and tested.

1. Introduction

The accelerated development of the world's new military transformation has brought new challenges and opportunities to China's military strength. An army capable of winning battles depends on equipment and talent. In the future, a large number of innovative talents will be needed in the battlefield under the condition of informationization [1]. Military engineering colleges shoulder the mission of training innovative talents of Engineering Technology for the army. These talents will be the developers, users and guarantors of new weapons and equipment in the future, and contribute wisdom and strength to national defense [2-3].

Innovative practical activities are an important channel for training innovative talents of Engineering technology. It integrates mathematics, physics, chemistry, mechanics, machinery, electronics, control, computer and other disciplines and could exercise students 'scientific literacy and creative thinking in an all-round way. Because of its remarkable effect in local colleges, military engineering colleges have been gradually popularized in recent years [4-5]. But at present, because military engineering colleges are different from local colleges in system and mechanism, there are many specific problems in the Extension process [6-7]. This paper makes a comprehensive analysis, reform exploration and practice test on the problems of creative practice in engineering colleges.

2. Effectiveness Analysis of Innovation Practice Activities

Innovative practice activities build a bridge between theory and practice and a stage for students to display their individuality. In the company interview, Enterprises will give priority to students who have participated in innovative practice activities. Supervisor of Master also like this kind of students when choosing students [8-9]. Leadership response of the army, trainees who have participated in innovative practice activities are easier to adapt to the needs of the post, have a stronger sense of teamwork, a more steadfast style of work, and more active creative thinking [10]. Practice has proved that innovative practice activities are effective in cultivating students' innovative spirit, training students' practical ability and enhancing students' sense of cooperation.

3. Analysis on the Current Situation of Innovative Practice Activities

3.1. Less time and heavy tasks

Cadets not only have to complete a large number of courses, but also have heavy training tasks. In addition, there are collective activities such as political education and Party and League activities. Cadets have little time for autonomy, so it is difficult to guarantee the time for their innovative practice activities. Sometimes they can only stay up late overtime.

3.2. More courses and less class hours

Cadets have about 20% more courses than local college students, and nearly 30% less class hours per course. For example, "mechanical principle", the hours of relevant specialties in local colleges are about 80 class hours, while those in military engineering colleges are about 50 class hours.

3.3. Pay attention to results and look down on processes

In terms of evaluation methods of innovative practice activities, engineering colleges and local colleges and universities have the same understanding. They mostly take the following contents as criteria, including the grade of participating in innovative practice competitions, the award-winning grade, the quality of scientific research projects, and the grade of relevant achievements and so on. The original intention of innovative practice activities is to build a bridge for students to integrate theory with practice and pay attention to the growth of students in the activities. The current evaluation criteria focus on the results, too single, no good service of this essence and the original intention.

4. Exploration on the New Model Reform of Innovative Practice Activities

Based on the above analysis, this paper puts forward new reform measures of innovative practice activities in military engineering colleges, with a view to solving the outstanding problems and resolving the contradictions and conflicts. The general idea is to build an innovative practice system of "one position, three bastions". So as to mobilize the enthusiasm of the whole staff, so that students can grow in practical activities, and the quality of innovation can be improved as a whole.

4.1. Concentric circle innovation practice "position"

The position is divided into five layers, from the outside to the inside, as follows: learning layer, theory layer, practice layer, competition layer and core layer. As show in Fig.1, Concentric circle innovation practice "position". What layer cadets can go to depends on their interests and efforts. The closer to the core layer, the more the students gain, the more obvious the growth and progress.

The learning layer. It is suitable for freshmen. Its main task is to visit, see and cultivate their interest. The theory layer. The theory layer is suitable for sophomores. We offer internal training and innovation courses to popularize innovation and teach cadets some necessary knowledge of innovative practical activities. The curriculum system consists of three parts: innovative methods, innovative design and innovative practice. The innovative methods course include: TRIZ Theory, Creative Design; The innovative design courses include: Creative Engineering and so on; The innovative practical courses include: Tool Operation Basis, Programming Basis and so on. These courses should be lean and practical, and the number of class hours should be reduced as much as possible on the premise of ensuring the quality of teaching. In order to highlight the principle of "teaching students in accordance with their aptitude", these courses are optional courses, and cadets could be choosing courses or chapters which suitable for themselves. The practice layer. The practice layer is suitable for sophomores and juniors. At the practical layer, we have set up a number of small topics for students to complete in practice. After practicing, the cadets have the basic ability of innovative practice. The competition layer. The competition layer is suitable for juniors or above. At this stage, the cadets have experienced the training of theory and practice, and have certain qualities

and abilities. We support and guide them to participate in innovative practice competitions outside school. For example: Innovative Knowledge Competition, Mechanical Innovative Design Competition, Physical Innovative Spirit, Electronic Innovative Design Competition, Computer Innovative Design Competition and so on.

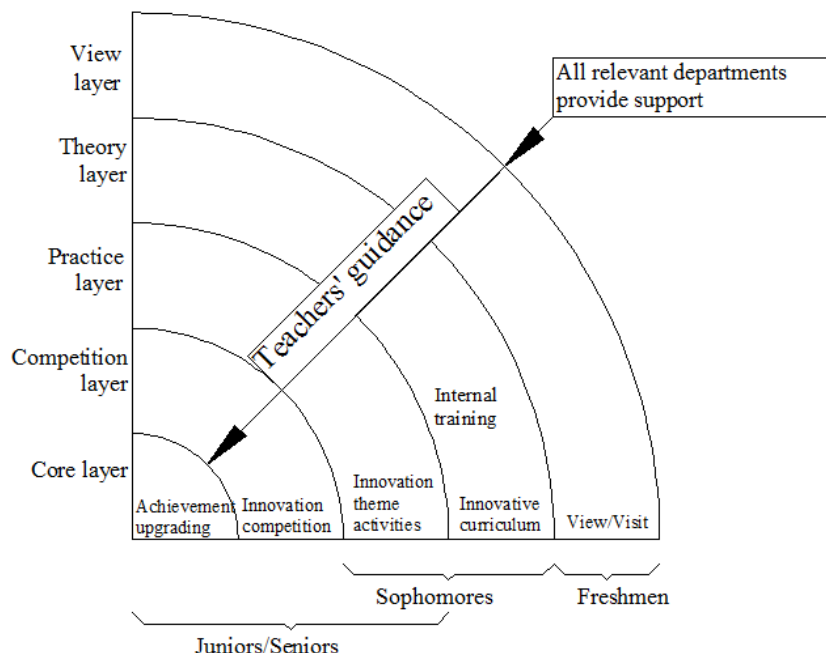


Figure 1. Concentric circle innovation practice "position"

4.2. Cultural "bastion"

Cultural "bastion" refers to the cultural atmosphere. Culture originates from accumulation, and cultural construction starts from continuous accumulation. Recording every technological breakthrough and every touching event in the process of cadets' innovative practice activities will form the cultural foundation of innovative practice activities over time. These cultural elements are displayed in the form of brochures, propaganda boards, micro-letters and micro-blogs, which make the positive energy cultural atmosphere lingering around the cadets and become the spiritual pillar and pursuit of the cadets. Thus, students are encouraged to stand on the shoulders of giants and constantly surpass them.

4.3. Evaluative "bastion"

We break down the evaluation criteria that emphasize results and establish a new evaluation method that emphasizes both result and process. It not only evaluates the achievements of cadets and teachers, but also evaluates the actual effect and process of innovative practice activities. It pays attention not only to innovative achievements but also to the growth of cadets and the development of innovative platforms. On the premise of paying equal attention to process and result, we should constantly revise and improve it to adapt to the change of time.

4.4. Thought "bastion"

Establish the guiding ideology of "people-oriented, teaching students in accordance with their aptitude". First of all, we should recognize the function of assistant teaching of innovative practical activities and build a bridge between theory and Practice for students, but it is not instant, it's gradual. Secondly, in the activities, cadets' initiative and autonomy should be actively mobilized. We should adhere to the principle of "people-oriented, teaching students in accordance with their aptitude", so that every student can free himself from the ideological constraints, innovate boldly, grow up and develop himself in the activities.

5. The Reform Practice of Innovative Practice Activities

Most of the reform measures have been put into practice, and all departments of the college have strengthened the importance of innovation practice activities, straightened out some rights and responsibilities, and achieved good results.

5.1. Relevant courses have achieved good results.

"Mechanical Innovative Design" and other elective courses are very popular, which shows the students' love of innovation. After class, many students reflected that they had experienced teaching and learned many innovative methods. Whenever we see some different convenient and reasonable places in our daily life, we want to apply innovative methods to transform it.

5.2. Relevant competitions have yielded fruitful results

The Mechanical Innovation Club organized excellent students to participate in the National Engineering Robot Competition, and won three first prizes, two more than a year ago. They led the cadets to participate in the National College Students Machinery Innovation Design Competition, won a second prize, the last award was nine years ago

5.3. Innovation achievement Escalating

The Mechanical Innovation Club actively promotes the transformation and upgrading of cadets' innovative achievements. Two innovative practical works have been patented, and two achievements have been published in the form of papers, none of which was published last year.

6. Conclusion

This paper affirms the necessity and effectiveness of innovative practice activities in the cultivation of innovative talents. Secondly, from the comparison of innovation practice activities between engineering colleges and local colleges, the outstanding problems faced by engineering colleges in carrying out innovation practice activities are analyzed. Finally, aiming at the related problems, the paper puts forward a new mode of innovative practice activity of "one position, three bastions". After more than one year's test, it is proved that the effect of this model is obvious. It is hoped that this model can provide some feasible references for the reform and development of other related teaching activities.

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