Research on Model of Actively Study in Construction Material in Applied Undergraduate Colleges

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Abstract. By analyzing the characteristics of the course of civil engineering materials, teaching contents, the personality characteristics and learning habits of students, combined with the research project of the college experimental teaching platform and Key Laboratory of solid waste, the introduction of PBL (project based learning) teaching ideas and active learning mode, explore the teaching methods suitable for the professional the characteristics of students of civil engineering in Application-oriented College. Get a good teaching effect.

Preface

Local applied undergraduate colleges and universities students have distinct regional characteristics and distinct learning style. we prepare the application and the regional characteristic in the process of teaching [1], and focus on the study and practice learning the subject's active cognitive [2], students' individual differences, such as: gender, language, potential, motivation, cognitive style, personality and geographical factors, etc.; Second, the research learning process, such as: the role of original knowledge and learning strategy research, etc. [3]. Established on the basis of the characteristics of students, respect individuality, flexible and varied teaching new mode.

In this paper, the main body of learning mode (see Fig 1) how to influence learning civil engineering material and teaching effect are studied and discussed. And in the classroom theory teaching and practice, use of Huaiyin Institute of Technology of provincial experimental teaching demonstration center, municipal solid wastes can be recycled key laboratory of practice teaching resources platform, such as trying to adopt flexible and varied forms of teaching, active and changeable active learning strategy, stimulate students' initiative and spontaneity, and through the PBL thoughts, heuristic methods, guide students to active learning. Through an engineering example, project research and combining the teaching experiment training students' experimental skills and hands-on ability, and the ability of active thinking [4].

Problem-based Teaching

In the usual teaching activity, the teacher according to students' personality and learning habits and course content, set up the main content of the course teaching and scenarios. A student to collect related information science and engineering, and puts forward problems; Teacher choose valuable problem, achieved through group discussion, debate, cognitive, and solve problems. Students cannot solve the problem, and then pointed to disabuse shall be conducted by the teacher. In the process of teaching activities, committed to build a “ask - question” environment, let the students know what to ask, how to ask, how to do? At the same time let the students know what to answer, how to answer, how to do it. This is a very important one annulus. On the one hand, let the student positive thinking, initiative; On the other hand, guides the student to discuss each other, exchange disambiguation, when students discuss to encourage students to develop and verify their own conjecture and conclusion, raises the student independent thinking, to find the answer, and problem solving skills, reflect the process of students' inquiry, also give students opportunities to show personality.

In setting up learning content and scene, conscious thought and use of college teaching platform of renewable resources and solid waste using key laboratory research resources, do project can set goals
to achieve, have innovative achievements. In the project study, fully promote students’ innovation consciousness and practice ability, to stimulate students' learning enthusiasm and main body participation.

**The Teaching Method and Train of Thought**

According to the characteristics of the course and students, I put forward: in the traditional teaching and practice, on the basis of moderate adopt flexible and varied teaching form [5], active learning strategy, arouse the students' initiative and the cognitive learning spontaneity, teaching process of PBL teaching and heuristic teaching methods; At the same time in the classroom theory teaching and practice teaching link, according to the syllabus and the student interest, adjust the teaching content, highlight the various chapters in correlation and inheritance; And actively put forward problems in the engineering and project practice, let students interest in active participation, sparking interest in passive students from several aspects, and take the initiative to solve the problem, part teaching contents of striving to move from the classroom to practical engineering projects, and encourage students to put forward the practical and local, operational characteristics, inspire the student thinking, positive discussion, to cultivate students ability to solve practical problems and rigorous, practical and realistic style of study.

![Figure 1. Active Learning Pattern Organization Structure.](image)

**Emphasis**

This course in the teaching activities combined with the school location and the professional characteristics and local social needs, the major of civil engineering material course content and the key contents: the concrete, cement, steel, waterproof materials as main content, the teaching and focused in the teaching process of various materials application in construction projects and the related relations. Outstanding content when teaching Settings on the inner link, and through heuristic thinking, highlight the part between the parallel, causal and dependency, give students a clear teaching ideas at the same time, to grasp the good content of each part of the primary and secondary relations.

**Content**

The current new materials, new technology, new standards, new ideas and the subject development to enrich teaching in time, make the teaching content has distinct era and advanced. And timely introduction of the current case of major engineering both at home and abroad, from the perspective of the application of civil engineering materials, guide students to think. Such as the wen chuan earthquake caused local houses collapsed, 08 to the selection of building materials and structures, the
determination of design, so as to promote students' ability of autonomous learning and independent thinking, improve the comprehensive quality of students and the teaching quality, cultivate the students' interest in study of civil engineering materials.

**Stimulate**

In the process of classroom teaching, appropriate content of the textbook knowledge in combination with the practical situation of project, by asking questions, questions, students actively, actively to carry on the correct thinking, encourage students to class to ask questions at the same time, lets the student participate in discussions, the opinion, as a result, not only active classroom atmosphere, and stimulate students' interest in learning, cultivate their analysis solution actual problem ability. Such as: the general use of high strength concrete, baked brick and autoclaved brick use future policy background? Combined with renewable resources use key laboratory of the college and students, please list which construction waste can be recycled? As well as its usage? Through questions and discuss ways to strengthen the students' learning enthusiasm, active classroom atmosphere. And like talking about the concept of standard consistence and cement standard consistency water, because the concept is abstract, students understand is difficult, then asked the students through their combining in-class experiments to understand this concept, it also inspired the students' interest in doing experiments.

**Confidence**

In local colleges for applied undergraduate students, the most common psychological is negative and timid, it is because they strength without the correct understanding of yourself, don't believe in your ability, led to the shrinking or avoid negative behavior. Aiming at this phenomenon, we in the teaching activities, bold design topic, to encourage participation in practice. Such as encouraging students to actively declare, 2011, 2012 grade students bear the college students' practice innovation of science and technology plan projects in Jiangsu province, on renewable utilization technology of alkaline system and comprehensive study. During the study, the students correct understanding of their own strength, dares to challenge, active learning, ask questions and solve problems in the project research, to realize self-worth, successful 2 published academic papers, fully experience the joy of success.

**The Teaching Evaluation**

In the classroom, the students actively participate in the discussion, opens the mouth to ask questions actively, and in the implementation of teaching activities, and put forward by the original plain simple question to the idealistic question. Can't solve problems by themselves, the team can do voluntary cooperation and communication between the classmate inside, discuss to improve; Find out the best solution at the same time improve the students' comprehensive language competence, mutual communication skills, hands-on ability, to achieve the mutual cooperation between the students learning.

<table>
<thead>
<tr>
<th>Grade /students</th>
<th>The average scores</th>
<th>Proficiency(&gt;85),%</th>
<th>Don't pass,%</th>
<th>College students' science and technology innovation plan</th>
<th>others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013/42</td>
<td>78.21</td>
<td>33%</td>
<td>0</td>
<td>4 (provincial)</td>
<td></td>
</tr>
<tr>
<td>2012/51</td>
<td>73.01</td>
<td>20%</td>
<td>9.5%</td>
<td>2(provincial)</td>
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</tr>
<tr>
<td>2011/98</td>
<td>72.58</td>
<td>14.28%</td>
<td>6%</td>
<td>1(provincial)</td>
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<tr>
<td>2010/128</td>
<td>68.02</td>
<td>5.47%</td>
<td>14.06%</td>
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</tr>
<tr>
<td>2009/85</td>
<td>69.37</td>
<td>9.41%</td>
<td>10.59%</td>
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</tbody>
</table>

Through the establishment of student-centered teaching mode, form is given priority to with independent type, cooperation type, research type of study way, attach importance to the combination
of theory with practice, emphasis on teamwork, by organizing students to participate in scientific research projects of all types and at all levels, such as college students of science and technology innovation plan form, let more students love the civil engineering material course, devoted to the study and research the field of civil engineering materials to improve college students innovative design ability, practical ability and the cooperation and communication ability, promoting the harmonious development of students' knowledge, ability and quality.

Conclusions

Based on school, school-running orientation and the characteristics of students in the curriculum of civil engineering material as the appropriate teaching way and method to adjust and reform, in the process of classroom teaching and experimental teaching adopted flexible and varied teaching form, fully stimulate students' initiative and spontaneity, during the group's ideas, and by induction, heuristic, problem-based method to guide students to active learning. To pay equal attention to theory and practice, the interaction between teachers and students, classroom teaching and the research method of combining the project, to improve the students' interest in learning and to achieve the goal of comprehensive quality.

From the final objective evaluation of teaching effect: after the implementation of active learning pattern, 11, 12, 13 students learning achievement is not the implementation of active learning pattern grade 09, 10 students had improved significantly; And take the initiative to declare teachers college students' innovation of science and technology plan, participate in the engineering practice on science and technology research and development projects, such as 11, 12, 13 students are also presents obvious enthusiasm. Therefore, through the problem set, class discussion, project research, problem solving and other comprehensive teaching link, it can be seen that the learning ability of students is an obvious increase, and in engineering practice, the ability to choose material as well as the ability to deal with uncertainty problems have increased significantly. Of course there are a few students think learning is difficult, cause this kind of situation has a variety of reasons, such as insufficient inertia, self-learning ability, etc. For this kind of situation, can use the hierarchical teaching, can partly solve the problem, after this is also one of the goals of hard.

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References


