Three-Dimensional Construction of Active Learning Model for College Students

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Abstract. From the teacher's class design, to student’s completion of consolidation and expansion for knowledge after class, it is multi-faceted to build a model that students will learn actively. Teachers integrate the content of lessons, and pay attention to their interrelationships to create a relaxed and open learning environment. It means teaching process is like story telling, while using a variety of teaching methods and auxiliary means to allow students to participate in that process and improve their learning interest. After class topics are designed for students by teacher, at the same time, they are guided into laboratories, lecture halls and other forms, to develop their professional knowledge, improve their practical ability and innovation ability. Through the classroom and extracurricular ways, teaching and learning are interacted, to mobilize students’ active learning and innovative talents.

Introduction

University life has many characteristics like consciousness, universality, flexibility and professional, which is different from the basic education[1]. According to the characteristics of the university stage, it is necessary to adjust the previous learning methods to adapt to the new environment. University study is no longer simply to accept the recognized knowledge, such as theorem, axiom, etc., but to start a professional field in-depth study on the basis of existing knowledge. Its content include frontier research as well as the specific production process, much knowledge is unknown and inquiring. Creative work requires creative minds, if we continue the passive learning model of basic education, it is difficult to give full play to the role of four years of university training, therefore, it is very important to mobilize college students active learning and innovative thinking.

Basic education focus on the accumulation of knowledge, for practical applications are mostly present in a variety of application questions for test, which makes students only know what kind of knowledge points can solve the problem on paper. While the university education is to lay the foundation for career, facing with all kinds of practical problems. They will find the problem in practice, and then turn the problem into professional data, and finally use the analysis to solve the problem. It not only need a wealth of professional knowledge, but also have the correct thinking to proceed smoothly. Therefore, it is difficult to convert it into practical application in the university learning process if only using mechanical and passive memory. The key of “Knowledge change destiny” is applying the knowledge, do not use and cannot use knowledge, it is just an abstract concept, then, how should we use knowledge? It depends on active thinking and tandem organization, mastery and transformation it into a solution to the problem. Therefore, the active learning in the university is also the beginning of taking the initiative to think, analyzing the problem independently and solving the problem in the future, only to mobilize initiative, learn to bear the responsibility, and have courage to take responsibility, that is our purpose to train the talents. Like a machine which is passive acceptance and passive doing things, it is difficult to link with the creation of innovation but lack of the soul. Therefore, to guide students to change the way of learning in the university stage, to
develop their habit of learning and take the initiative to learn as an opportunity to drive self-thinking, so take the initiative to think, to practice, to create, transforming knowledge into power.

Based on this understanding, we are from the two aspects of teaching and learning, to mobilize the students to take the initiative to learn, think, and develop creative thinking.

The Design of Teacher’s Course

Teaching Content

In university, one class is generally 50 minutes. From a professional point of view, the course covers a wide range of contents, many teachers have a wish that let their students learn knowledge as much as possible in one class. Therefore, teachers pay more attention to the quantity of knowledge. However, with the development of science and technology, the amount of knowledge is growing in explosive. So this way will make teachers and students feel tired. If teachers can understand and sort out the knowledge, then they could make a main structure of knowledge, cultivate students' learning initiative, and improve their learning efficient.

In addition, students as a social individual, they will be in social and face various affairs independently in the future. It will help their development if they have good outlook upon life, values and world. Therefore, the teacher should not only impart professional knowledge to students, but also need to teach them how to be a good man and guide students who are in the difficulties. In this regard, our school implemented the "moral classroom" and "academic mentor" new initiatives, narrowing the relationship between teachers and students. Students can have more opportunities to understand teachers, understand the professional, have a better recognition about the purpose and meaning of learning, reduce their confusion and have new goals and motivation. Teachers teach students knowledge, and at the same time, teachers get student's trust and get more opportunities to understand them. This is good for students growth, but also good for accomplishing the teaching target. This is also consistent with the thinking that “teacher, impart professional knowledge and resolve doubts.”

Content Design

Teacher attends the class is similar to the director makes film, it has to integrate its interpretation with the script, therefore, the teacher also needs to organize and design the content. The most common way is to find a textbook, teaching in accordance with the book. This teaching method can be said to be cautious, nothing wrong, but the effect may not be the best, we may endeavor some new methods. For example, the specialized courses, the content is often involved in two blocks, one is the basic professional knowledge, which is a public content, it can be applied to all chapters, and is equivalent to a summary of the contents; The other one is more similar to the deductive part, having their own characteristics, but around the basic knowledge, and even some are specific applications and the further interpretation and promotion to the basic knowledge. So, can these two parts of the content combine together? We can take the basic knowledge as the lead, the applications of chapters as pearls, and blend them together into an artwork. In the teaching process, we can make the basis of the content throughout the course, and explain the basic knowledge points firstly, then get related to the relevant applications in advance, as the supporting evidence of the basic content. This will explain the theory, and allow students to learn how to apply, so that it is easy to combine the theory and practice. In some circumstances, the teacher can take some actual scientific research into a further extension, so that students will have a better understanding.

This kind of teaching content design is derived from students impetuous learning, especially for some postgraduates, ignoring the study of professional courses or not seeking solution, only studying subjects for GRE, and ignoring other subjects, which leads to the whole professional learning system is not perfect. Though their total score is very high, however, it is difficult to understand professional knowledge and when they answer questions we feel them like a layman, the main answer form is reciting, they do not understand how to use and lack the necessary think. This is a worrying things that need to be addressed together. As a teacher in the teaching process, through the knowledge in
series adjustment, so that students can know what is its point, but also know why, understand what can be done. That is, know it, and know why. It is very useful for students to grasp what they have learned, rather than simple rote.

**Teaching Process**

After designed the content, teachers can design how to mobilize students to participate happily. They should consider mobilizing the students' interest in learning, attracting students' attention and creating a relaxed and open learning environment for students to allow students to take the initiative to think and to express their views [2], this is the original intention of the course design. It is impossible for the teacher to teach all the students he knows, but only to students who want to know and the knowledge that students can understand in a limited time[3].So how can the boring professional class become attractive? Storytelling is a good choice. Design teaching content to be a story, select the actual production of the problems to explain, good questions and active participation in the discussion would improve the interest of learning and promote the activity of thinking.

First of all, teacher describes the problem objectively, and guide students into the problem like an engineer and technician, so let them think about the problem, inspired by the teacher, then use their previous knowledge to form an immature idea. Teachers are using professional knowledge to analyze the problem step by step, radiation from the key point to the relevant professional content, and then gradually in-depth, and finally back to the problem. Explain the professional knowledge clearly, then gradually extend the thinking towards how to analyze the problem and solve the problem, how to turn the problem into professional data and requirements? How to find the object in the adapted condition? How to combine all the factors to be the best? Finally, how to solve the problem under guidance of theories. After the whole process ended, selecting the relevant sections about this knowledge points for further application examples. The whole process which is from theory to practice then from practice back to theory can be integrated together. At the same time, it also taught students the thinking and process to analyze the problem and solve the problem. The process of teaching that integrate the heuristic, case-based, discussion and other teaching methods into one, revitalize the entire classroom. When story telling is finished, the interlocking knowledge points and their applications will be clearly presented to students, knowledge can be more easily system and completely absorbed. At the same time, it will provide fully immersive state for students, to learn the practical problems that they will face in the future, and understand the corresponding way to solve them, which is also easy to mobilize the learning enthusiasm.

**Use Auxiliary Details**

Nowadays, multimedia teaching provides great convenience for teachers. At the same time, some teachers have been restricted by computer, and difficult to communicate with students. So this scene is normal, teacher having class on the stage, and students listening off the stage. Sometimes it is not easy to be aware of the student's response to the lecture process, especially the classes with a lot of people. Therefore, if teachers talk with students frequently, contact with students closely, they could find students' questions, and encourage students to express the problem. Some problems are common, which is applicable for most students, so teachers also play a role that answer all students but one, and can improve the teaching process. It is helpful to understand and encourage students. In addition, come into the middle of the students make the distance between teachers and students closer, it is easier to understand the actual learning situation of students, and students are more willing to express their questions. At the same time, the questions raised by students can also make other students think about the answer, which gives chance to teacher to know the degree of knowledge grasped by students. When students answer, let other students to express their views and comments, and use their own words to express it. It is good for them to get rid of the shackles of textbooks and exchange knowledge into their own understanding. Coming into a discussion atmosphere, students can learn to sum up and compare the ideas of others to find their own shortcomings. These activities under the control of the teacher can play a positive role in the cultivation of students' ability, the teacher is a guidance for everyone. Through the teacher's classroom design, the students and teachers study
together and mobilize the initiative of learning. Questions, answers, comments, and summary make teaching and learning together. Teachers entre into students is beneficial to the learning process and the cultivation of students' sound personality with the vivid image.

Students' Off-Class Knowledge Consolidation and Expansion

Through the communication between teachers and students, students and students, we can guide the students from passive learning to active inquiry learning mode, from a single form of classroom learning and teaching materials learning into an open network learning model. We use the advanced learning methods such as inquiry learning, cooperative learning, and online learning to maximize the potential of students and improve their learning ability, innovation ability, practical ability and communication ability [4].

Homework

Off class, teacher can design questions for students to access information, understand and enrich the contents of the class, as a guidance. Many students are accustomed to the learning mode that listening in class, doing homework after class, this habit can be extended. In the teaching process, teachers can guide students toward the direction of future work by asking them questions about frontier scientific research, or analyzing core technology in production. Professional courses cannot be involved in only a textbook, it is generally recommended more than one textbooks, as well as more than one reference books. In order to enrich the professional content, the literature of network database is an indispensable way of learning. When teacher introduced the main knowledge on class, then students can use a variety of methods to collect relevant contents to enrich and extend their knowledge system, so students can easily build the knowledge structure. Therefore, it is necessary to consolidate and expand the knowledge after class. Teachers design topics, so that students can freely play on the basis that they mastered. Initially they may be asked to write a simple small essay for a knowledge point, then with the course advanced, they will be able to write a whole paper. To complete such a job, the key is retrieving and organizing information. Through this training it allows students to learn a variety of ways to obtain information and to collect what kind of information in order to get the basic knowledge, how to obtain frontier research, what the characteristics of patent information are, which will greatly open up the horizons of students, also not just stare at a single textbook. This also gives some courageous students a self-enterprising path, and for most students, studying is not only teaching materials, but the open Internet, a new learning world for them.

Go into Labs

The laboratory is a bridge of theoretical knowledge and experimental practice [5]. With the development of network, the smooth flow of information, college students get the form of knowledge more convenient, combined with the characteristics of agile and active thinking, they can easily form some new ideas. However, due to the current education system, in which the practice ability is weaker than test ability, many sparks of inspiration are often just a flash, it is difficult to transform and implement. Therefore, to introduce students into the laboratory by a variety of ways, is conducive to improving the students' practical ability, operating ability and information processing capabilities, but also conducive to students' innovative cogitation, and innovative ability. In these areas, from the national level to the school and teachers provide better and better conditions for students, such as the national college students innovation and entrepreneurship program, challenge cup, all kinds of professional and technology competition, school open experiments, innovation plan, second class and so on. University teachers are also professional talents, they also study all kinds of horizontal and vertical topics when they are teaching, which can allow college students to participate in, and students can get timely guidance. Therefore, college students can take advantage of the process of entering the laboratory, improve their practical experience and consolidate theoretical knowledge.
Attend the Lecture Hall

University life is very meaningful and colorful, the exchange between school and school, school and business are active, Milton said, "Our faith and knowledge, like our bodies and face, are more exercise and more healthy, and the truth is likened to a spring in the Bible, and if it does not flow, it will dry up into a traditional and formality mud "[6]. This shows the importance of academic exchanges, it provide boost for the development of the school and widen the vision of the students. The school often invite some academic masters or business leaders to deliver lectures. Lecture is another important platform outside the classroom, college students can get knowledge and understand the frontier scientific dynamic state, enhance the thinking and it is usually considered as a form of missionary communication that means "large amount of information, strong timeliness " [7]. This is not only an academic feast for young students, but also they can learn valuable experience and humanistic spirit from these celebrity. However, due to the lack of awareness of the lectures, students regard it as an optional spice, rather than an important part of the campus culture, so many students have not been able to make full use of the second class of college life, and benefit is not wide. The future task is to guide students to participate in the lecture actively, to make full use of this learning platform, to promote the development of their own potential and the spirit of innovation.

Summary

In summary, the cultivation of talent is not the manufacture of machinery, more and more people know and desire for creativity, the purpose of education is to cultivate qualified workers for the community. One of the basic factors that can stimulate creativity is "autonomy", only by independent learning, independent thinking, can we initiative to assume responsibility, and create unlimited potential for creativity. Therefore, in the whole process of systematic education, as a teacher, we have the responsibility to focus on the needs of future talents and the needs of society in the practice of teaching and learning. Proactive, bold attempt, team work and in class and off class hard work will mobilize the initiative of students. Constructing the active learning mode among college students will be helpful to realize the national education plan.

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