

Research on Improving the Teaching Efficiency of Higher Education Based on the Detail Teaching Method

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ABSTRACT¹

With the reformation of Chinese Higher Education deepening, high schools have witnessed a series of teaching and learning contradictions which are typical of current era style. This article itself takes the teaching practice in Guangdong University of Technology (GDUT) for instance to research the contradictions between teachers and students by analyzing their characteristics between teachers and students. It puts forward the detail teaching method, which uses seven specific means to study how to improve the teaching efficiency of Higher Education and provides concrete practical methods to be accustomed to the need of fostering suitable talents for society in universities and colleges.

INTRODUCTION

With the entire Higher Education system in China entering into the situation that irregular developments are urgently demanded, chances and challenges are existing as well. GDUT has stepped into construction of high-level universities in Guangdong province in recent 3 years. Though scientific research fruits impel university develop and improve, but what really embodies the social value of universities is the degree of knowledge and abilities of undergraduates who work in society. During the process of scientific research and teaching being treated in the same status, there are coming many contradictions and conflicts about Higher Education [1,2,3,4]. On the contrary, these contradictions produce powers of education reforming and teaching method exploring.

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Teaching and education is the most fundamental function of higher education. As a teacher of specialized courses with teaching as a main work and scientific researching as a casual job, I try to analyze the characteristics and contradictions of teachers and students, and bring up a detail teaching method to improve the teaching efficiency of higher education with the practical teaching experience. Hope to let myself, students and the social identify with GDUT.

RELATIONS BETWEEN TEACHERS AND STUDENTS IN HIGHRE EDUCAITON TEACHING

Education and teaching have distinct characteristics of times. The biggest features of current times are freedom and democracy. Teachers can freely allocate time in teaching and research while students can also freely allocate time in learning and playing. The freedom comes from democracy which can be simply called humanization. However, due to the fact that the multifunctional and multidimensional of human's role is realistically confined, the freedom is under restrictions while the democracy is conditional, thus to cause various contradictions. When these contradictions act on teaching, it can cause teachers' low teaching efficiency and the students' low ability to master knowledge, thus further damage the quality of talent cultivation in higher education directly.

Features of teachers in current higher education

The role of scientific research is given priority in universities, so teachers undertake the dual task of scientific research and teaching. Take the School of Electromechanical Engineering of GDUT as an example. It has 3160 undergraduates, 862 graduate students and 150 full-time teachers in 2015. The teachers undertook 217 courses and completed 1298 standard class hours per year, which included 1035 standard class hours of scientific research task and 263 standard class hours of teaching task. It is obvious that the average workload was heavy and the scientific research tasks had the heavy weight.

In recent years, students begin to choose class tutors in the second year in GDUT. Therefore, the students of three grades need to choose their tutors, and each tutor needs to guide 24 students every year on average. As a result, the tutors have limited time for every student even if they have enough time. On the other hand, as shown in Figure 1, teachers have limited working time in total. If they spend more time in teaching and tutoring students, they will have less time to do the scientific research. Consequently, the direct contradiction is that teachers have done better in teaching but greatly affected in scientific research and professional title assessment. In order to realize the basic functions of cultivating of knowledge system for undergraduate students in higher education, the teachers who work in the frontline either improve the teaching efficiency of or spend less time in scientific research.

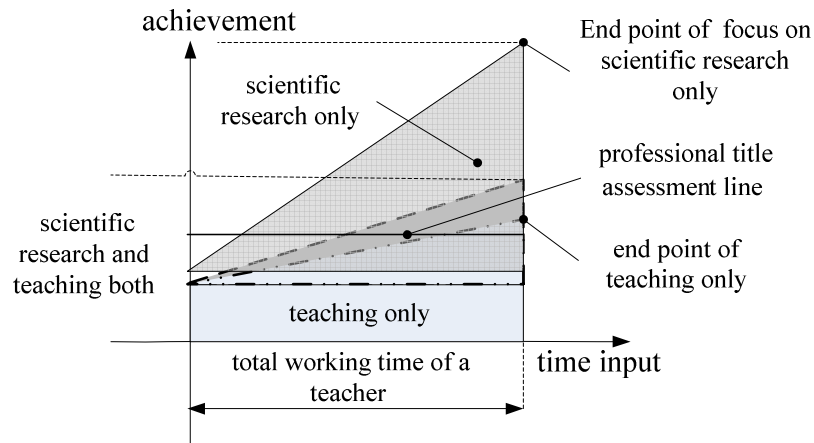


Figure 1. Relationship between time inputs and achievements in teaching and scientific research for a teacher.

Features of undergraduate students in current higher education

In modern times, students enjoy more freedom than ever before: they are financially abundant enough; they have more popularized network facilities; and they have more successful cases that can be used as guidance. These result in students having more interests in education period and more choices after graduation, which lead to lacks of clear direction and effective constraint for students. The mobile phones and networks occupy more time among students, and they change their roles from tools to friends and further become students' masters. Various associations provide plentiful practice opportunities, and meanwhile distract students' professional learning interests. Comparatively, learning professional knowledge in university is dull and cannot match up with the convenience and happiness of various social activities. Thus learning is respected but being left far away by students. These directly lead to many students staying up late, getting up late, being late for classes, being absent-minded in classes, reviewing nothing for classes, copying homework from network and cramming for final exams. The students have high failing rate of subjects. Take some class of 2012 grade with 84 students as example, in the courses of Hydraulic and Pneumatic which is started in 2016, 13 students applied for the delayed exam due to the preparation of postgraduate examination, and 8 students failed to pass the exam with the failing rate reached 11.2% for this course. The total failing rate of some class had reached 46.5% in the first year for 12 courses.

Analysis of contradiction problems between teachers and students

Through the discussion in a teaching conference which was composed of student representatives of each grade and leading teachers of different level and the interchanges with the students of 2015 Leading-engineer Class, seven main reasons of unbalance between teaching and learning are summarized as following: (1) teachers only read PPT in lectures; (2) teachers are not strict with students in classes; (3) teachers don't list the key points before exams; (4) some students are often skipping classes; (5) students don't finish their assignments seriously; (6) students

don't review their courses after class; (7) students don't do the experiments actively and they often copy others' reports.

There are three reasons for teachers and four reasons for students. From perspectives of students, the primary reason that they failed to complete assignments, to review the course and skip classes results from that: (1) firstly the teacher's teaching method is not vivid and attractive; (2) secondly they don't resolve the failing to understand the knowledge at first, and then accumulate more and more difficulties to understand, thus finally give up learning.

Teachers and students formed a paradox. Within this paradox, the quality of students reduced because as learners students didn't place constraints on their own learning process. Indeed, the teaching methods of teachers are key factors to affect the students' learning interests. In the following, I will take the teaching practice of three professional courses as starting point to discuss some detail teaching methods.

DETAIL TEACHING METHOD

In order to improve teaching efficiency, plenty of people put forward many methods from many aspects such as class teaching, school management and so on [3,4,5,6,7]. From my perspective, it's important for students to grasp knowledge in the process of limited professional teaching and trying to accomplish all teaching cognition in the class. If students can interact with initiative spontaneously, such as raising questions, reading books and reviewing after class, then as talented people products, they can grasp this course well and are expected to be elites. The detail teaching method is not specified method by school, but the method found in personal process of teaching and communicating with the students. It also needs the identification and cooperation of the school educational administration. And most important of all it needs the active interaction of students.

Approach of confinement

The approach refers to confine the students' caprice to the controlled teaching environment. Based on the 13th reverse principle of invention principle in TRIZ innovation approach, it turns the rules of operation into the reverse operation. Previously, the students often moved to another classroom, but now they can be tried to be confined to one classroom, which is relative consistent with the number of the students. For instance, 30 students should be in a classroom that can hold 35 students at maximum, thus the late for class, the leaving class early and the truancy can be clearly seen, even with the arrangement of fixed seats. This type of restraint not only can make students feel being fixed to study, but also can save the time of calling role.

Approach of reinforcement

The approach is to consolidate the course study in the short term by concentrating the learning time, to keep a sense of urgency and realize the coherent learning and memory. Originally, the two courses which both have 32 classes for students can be prolonged to the courses of 16 weeks. And the students attend to classroom every week, which has the fragmented feature. If they are changed into the approach that

one course should be completed within 8 weeks and another course can be completed within the other 8 weeks, or the two courses can be completed within 8 weeks simultaneously, the consolidation of each course can be compacted and coherent, thus students would not easily forget the content or have subconscious sense of slack for the long-time learning process.

Approach of mandatory

This is an approach that can form a principle. Instead of punishing students, the purpose of this approach is to tell students what is right by means of a compulsory principle. If a student is late for class, automatically he would be required to stand at the last row for the minutes that he was late for, and then he can learn to be punctual through the punishment. When the teacher orders students to stand up at the beginning of the class, the students follow the instructions and greet to the teacher. It has two aims: one is that everyone can be cheered up by standing up, the other is that students should be show respect to teachers because the teacher would stand on the platform for two classes and the students should stand up to correspond to teacher. Mobile phones should be strictly forbidden in classes, or the mobile phones would be temporarily confiscated to the counsellor. Eating breakfast in classes should also be forbidden, and the students should go to bed before 24:00 and get up at 7:00 PM, as well as go to classrooms to discuss, review and preview the lessons at about 8:10 PM.

Approach of teaching two courses

One feature of teaching in higher education is with little communication between teachers and students. Thus an attempt can be made that over two professional courses for one class were lectured by the same teacher. The advantage of this way is that teachers can have more time to communicate with students, and teachers can combine the knowledge of several professional courses to the students. I have made two successive attempts to teach two specialized courses to the same class, which include "Hydraulic and Pneumatic" and "Technology of Engineering Test", and mix the "Fundamental and Application of Computer" that they have learned before into the learning process. Through doing this, students know about designs of CNC hydraulic injection moulding machine or CNC hydraulic drilling machine.

The above-mentioned details of class teaching approaches are able to enhance the class efficiency, spare students' learning time, increase communication time in class and active learning time after class, cultivate discipline and habit in class, and improve the visualization of knowledge learning and so on.

CONCLUSIONS

Teaching is the process of interaction of teacher's lecturing and student's learning. Students and teachers are ought to respect and understand each other. In the teaching aspect, teachers have sincere conscience and good methods. In the learning aspects, students should acquire knowledge and respect teachers. The detail teaching method can be useful as an effective support for higher education. But teachers using this method should have certain teaching skills.

As technicians of fostering talented people, teachers must grasp technical skills. And students must have conscientious attitude. Attitude is everything. The purpose of detail teaching method is not to provide a kind of constraint but to foster a kind of custom for students. It will promote organic interaction and coalition of teachers and students accustomed to times characteristics of current society.

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REFERENCES

1. C Hu, 2017. "Some problems in Higher Mathematics Education in China". *Journal of Higher Education*, 2:100-102.
2. J Wang. 2013. "Higher education research: a perspective of education". *Journal of Higher Education*, 10:28-37.
3. D Zou, J Yang, S Cheng and Z. Guo, 2015. "Discussion on the Consistency of Undergraduates, Teachers and Society in Professional Education in College of Engineering". *International Journal of Sociology Study*, 3 (1):24-28.
4. D Zou, T Xiao, S Cheng and X. Wang 2017. "An Overview of the Inheritance and Learning of Teachers' Morality in Colleges and Universities". *Education Research Frontier (ERF)*, 7(1):22-27.
5. O Bai 2015. "Research on Current Situation and Countermeasures of Classroom Management in Colleges and Universities in the New Era". *Journal of Higher Education*, 24:134-135.
6. F Miao 2015. "Research on the Present Situation and Countermeasures of Classroom Teaching Management in Colleges and Universities". *Journal of Lanzhou Institute of education*, 31(8):96-97.
7. D Zou, X Wang., S Cheng., Z Guo and T. Xiao 2011. "Discussion on the Method of Fusion of Human Thinking and Behavior Characteristics in Measurement and Test Technology Teaching". *Proceedings of ITET2011*, VII:3768-72.