

# Practicing and improving undergraduate tutorial system in civil engineering major of NUAU

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**ABSTRACT.** *The undergraduate tutorial system is one of the main ways to achieve full staff education and brings much beneficial to the students. Undergraduate tutorial system can help students attend innovative and scientific training and make students not limited to textbooks, enable them to expand knowledge, increase awareness, enhance their brain flexibility, meticulous thinking, and rigorous research. There are also many problems in practicing the undergraduate tutorial system and may result in 'no contact' and 'no effect'. This paper introduces nine years' practicing and improving undergraduate tutorial system in civil engineering of Nanjing University of Aeronautics and Astronautics. The first intervention time and method was adjusted. The work content and students' assignments were established. After continuous improvement the students' satisfaction has improved. It shows that the clear orientation, well-defined assignments and cross grade group building can help to promote the efficiency of undergraduate tutorial system.*

**KEYWORDS:** *undergraduate tutorial system, continuous improvement, clear orientation, well-defined assignments*

## 1. Introduction

The system design of cultivating students in higher education institutes is generally divided into two parts: teaching management and student management[1]. Teachers are responsible for the teaching of training program courses, and counselors are responsible for the daily education and management of students. The phenomenon of separation between teaching and student management has long existed and restricted the cultivating efficiency. What's more, with the enrollment expansion of higher education institutes, it brings a big gap between the number of full-time counselors and the number of students, which is generally more than 1:200[2]. So it is difficult for counselors to carry out their work in depth and in detail.

In order to improve teachers to play their roles as the main body of education in

colleges and universities, many colleges and universities test to practice undergraduate tutorial system. The development of the undergraduate tutorial system is one of the main ways to achieve full staff education[3]. Undergraduate tutorial system is a high expectation teaching mode for some university administrators to improve the quality of talent training, cultivate students' innovative and independent thinking consciousness. Some researchers have verified the great advantages in cultivating the innovation and entrepreneurship ability of college students of this mode[4]. Also there is researcher verified that the tutorial system for undergraduates helped to improve the employment rate and the pass rate of postgraduate entrance examination[5].

But there are also many problems in practicing the undergraduate tutorial system. For example, due to the heavy task of teaching and scientific research, the meetings between tutors and students are deficiency, the proportion of tutors and students who "have something to contact, nothing no contact" is quite high[6]. Students may often think they have no need to contact the tutors. So in some cases the undergraduate tutorial system was virtual and brought no efficiency.

Recent years the development of information technology has brought convenience to people's communication. As a product of the current modernization, the new media not only brings advanced forms of information dissemination, but also has a positive impact on the development of ideological and political education of college students[7]. Which may also bring new changes of undergraduate tutorial system. Here we introduce our nine years' practicing and improving undergraduate tutorial system in civil engineering of Nanjing University of Aeronautics and Astronautics. With adopting some implementation measures and channels, the students' satisfaction has improved.

## **2. Practicing and improving our tutorial system**

### ***2.1 First four years' practicing***

There was a counselor for the civil engineering students but he also had to be responsible for other two majors' students, so the counselor number to student number is beyond 1:200. There was also a class advisor for each class. But the class advisors had to put their limited energies on the construction of class atmosphere and study style. They intended to manage the head and tail of the students' queue according to the grade or some special student.

There were 25 professional teachers and about 60 students every year. So the undergraduate tutorial system was first brought into force in 2011. Undergraduates are taught in tutorial groups, typically made up of one to three students. The system included: (1) Specified the work content of tutor, such as to care about and understand students' ideological situation, and guide students to establish correct outlook on life, world outlook and values, to help freshmen adapt to university life as soon as possible; to guide senior students to carry out research-based learning and so on. (2) Every professional teacher was arranged to accept 2 or 3 sophomores

randomly every year and kept the relationship until the students graduated. (3) Every year a meeting between the tutors and the sophomores. (4) Tutors or students can contact each other informal.

But all the tutor work was free and compulsory and there was also no method to assess. So the result was not very good. There were less than 1/5 professional teachers playing some role on the students and lack of specificity in students' ability promoting.

### ***2.2 Second four years' practicing***

The tutors interposed sophomores seemed to not work well. So the allocation and meeting was moved up to the second semester of the freshman. Civil engineering students' association for science and technology was set up to promote the research training link between tutors and students. The students were encouraged to contact with tutors to apply innovative training program for college students. That means the tutor's duty of helping students gain research training was specified.

But the innovative training program numbers were limited, many students didn't apply voluntarily or didn't carry out implementation after application.

These three years a forum of senior students was held every year after they past the defense and the effect of the undergraduate tutorial system was inquired. It showed that most students thought that they were full of hope for the undergraduate tutorial system at the beginning, but the results were disappointing. For they seemed not to know what or when to contact with the tutor.

### ***2.3 New measures***

After three years of continuous inspection of the undergraduate tutorial system. Some defects of practicing the mode were concluded from last year.

(1) The system orientation was redefined.

There are often two main orientations of undergraduate tutorial system in China: one is to guide students' professional learning and academic research; the other one is comprehensive tutorial system, including ideological guidance, professional guidance, life guidance and psychological counseling to students. In fact, too much responsibility also may equal to no responsibility. The tutor's role should be different with class advisor and counselor. So the system orientation is redefined to individualized training of the students.

(2) The students' assignments were set up.

Students do not take the initiative to contact with tutor because they lack motivation. So some assignments were issued unified by the department, including reviewing literature, writing scientific papers, attending innovative and scientific training and summarizing the whole training program. Some competition such as

structural innovation design competition, transportation technology competition and BIM competition are included. Tutorial system demands students to do the assignments and such demand requires creativity. So they get more chances and necessities to discuss with tutors.

(3) The assessment mechanism was established.

Every student should report their innovative or scientific training program during their seventh semester and the seminar will be organized by the department. Grade and credit will be given to the students according to their achievements. On the other hand, the tutorial work of teacher was assessed according to the students' achievements. This work is counted in teacher's whole year work and may be awarded.

(4) Communication channels were established according to new media

On the first meeting between tutors and students, some more communication methods such as WeChat, QQ were provided besides mobile phone number. So the WeChat or QQ group was often set by the tutor and the four grades of students were built a team. They can communicate with each other or with tutor. For example, a team of a tutor attended the transportation technology competition this year and gained the second awarded. The lower-grade students indicated that they gain more than the award.

### **3. Assessment and summary**

A survey was carried out to the seniors, juniors and sophomores of civil engineering. For the seniors the assessment of 'obvious effect', 'some effective', 'no effect' is respectively 5.0%, 70.0%, 25.0%. For the juniors the assessment of 'obvious effect', 'some effective', 'no effect' is respectively 10.2%, 65.3%, 24.5%. For the sophomores the assessment of 'obvious effect', 'some effective', 'no effect' is respectively 15.0%, 51.7%, 33.3%. The statistical results show that after continuous improvement, the recognition of undergraduate tutorial system is promoted. More obvious effect was brought two the juniors and sophomores because the assignments were arranged. But also there were more 'no effect' to the sophomores than junior which may because they haven't studied many professional courses and have less opportunities to discuss with their tutor and accept the research assignment.

Undergraduate tutorial system can help students attend innovative and scientific training and make students not limited to textbooks, enable them to participate in practical applications, expand knowledge, increase awareness, enhance their brain flexibility, meticulous thinking, and rigorous research. The deficiency of the first classroom is supplemented by the tutorial system.

It is necessary to take measures to improve the implementation of undergraduate tutorial system. The clear orientation, well-defined assignments and cross grade group building can help to promote the efficiency of the mode.

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