

Adaptive Teaching Strategies of College Teachers Based on Freshmen Learning Situation Analysis

Hanlu Wang and Bauminwood

Abstract—The analysis of learning situation is an important part of teaching activities. Teachers should conduct a rigorous analysis of learning situation before class to grasp the realistic learning needs of students. Through an investigation case and a unique method of analysis of learning situation, the authors accurately grasp the real needs of new students' learning. And give adaptive teaching strategies advise. It is further discussed that teachers should and can make more effective teaching measures for students' learning, promote the improvement of teaching quality, clarify the educational objectives for students, and improve the training programs for students.

Keywords—Academic mentor, Adaptive teaching, Freshman guidance, Learning situation analysis.

I. INTRODUCTION

At present, college students of various majors are facing employment difficulties to varying degrees, and people tend to attribute the employment difficulties to the decline of college training quality. People from all walks of life are increasingly concerned about the development of education and the quality of teaching in higher education institutions. Since 2018, China's Ministry of Education has made great efforts to introduce a number of policies and take measures to pay close attention to the teaching quality of colleges and universities, and has achieved great results.

In fact, the improvement of teaching quality in colleges and universities is affected by many factors. System construction, professional development, and the efforts of teachers and students are all very important factors. When university system construction and teaching reform are in full bloom, students and grass-roots teachers also have an inescapable responsibility and responsibility in improving teaching quality. In order to timely find out what teachers and students can do to improve teaching quality and improve learning efficiency, better promote students to acquire knowledge efficiently and become talents to meet social needs as soon as possible. Teachers and students of the Artificial Intelligence College of Neijiang Normal University joined forces to do a survey of freshmen's

enrollment.

II. THE BASIC IDEA OF LEARNING PROMOTION

Students' learning efficiency is the necessary guarantee for students to complete their studies, and its level is influenced by many factors. Various factors affecting students' learning efficiency can be found through the investigation of learning situation. For these factors, some of them cannot be changed or exerted by grass-roots teachers, and some of them cannot be changed, enhanced or eliminated by students' subjective efforts. However, some factors must be considered by teachers in the teaching process, some can be used by teachers in the teaching process, and some factors can be actively changed, internalized, enhanced or eliminated by students.

Through the design of the questionnaire, we added some questions to clarify the relationship between teachers, students and influencing factors. It can be found out which factors must be considered in the teaching process, which factors are more important factors, what are the conditions for the effect of these factors, and the correlation between these factors and the ordering relationship. Through sorting out these factors and analyzing the causal relationship between them and students' learning efficiency, we can find out what teachers and students can do for students' learning efficiency.

III. THE DESIGN OF THE QUESTIONNAIRE

The questionnaire is designed around four themes, namely, teachers, students, learning methods and learning environment. Each theme is divided into specific situations, and students are asked for opinions on these specific situations. How do these four topics affect students' learning efficiency, how do various specific situations within each topic affect students, how do students choose, such as how do students adapt to the unavoidable specific situations in these topics?

The questionnaire has either single choice or multiple choice questions. It investigates both objective questions and subjective situations. It covers all aspects of students' learning, and the problems are more comprehensive. There are both general problems and specific problems. The tone of the question was neutral and objective.

IV. THE AREA OF QUESTIONNAIRE DISTRIBUTION

In order to collect more information, the questionnaire is not limited to the students of our school. The questionnaire was distributed to the relevant freshmen through the organizer, and

Manuscript received November 30, 2024. This work was supported in part by the university-level Innovation and Entrepreneurship Training Plan of Neijiang Normal University under Grant X2023300.

Hanlu Wang is student(No.20221047004) in School of Artificial Intelligence, Neijiang Normal University, Neijiang City, Cichuan Province, 641100 China).

Bauminwood is now with the School of Artificial Intelligence, Neijiang Normal University, Neijiang City, Cichuan Province, 641100 China

the respondents were entrusted to continue the distribution to the relevant freshmen. According to the recovered questionnaires, the geographical distribution of the students participating in the questionnaire is relatively wide. The geographical distribution is: Sichuan Province, Guangxi Zhuang Autonomous Region, Guangdong Province, Chongqing Municipality, Henan Province, Hubei Province, Shandong Province, Jiangsu Province, Liaoning Province, Jilin Province. Let's wait. More than 270 freshmen from more than 30 colleges and universities participated in the survey.

V. ANALYSIS OF QUESTIONNAIRE SURVEY RESULTS

Some of questions and status of answers are illustrated as follows:



Fig. 1. Questionnaire statistical results.

We have made statistics on the choices of each answer sheet, and the statistical results show that students have different cognition and attitudes towards their new study life. Based on these obvious cognitive preferences, we conducted a comparative analysis.

A. Network Environment and Classroom Learning

Network environment is playing an increasingly important role in modern education. It is recognized as an effective way of learning and everyone likes it. However the statistics show, 90.6 percent of students think offline classes are better, while 9.4 percent think online classes are better. This gives light that most new students prefer the traditional offline teaching mode and believe that face-to-face interaction and classroom atmosphere can significantly promote their learning effect. However, 56.84% of students have already adapted to online courses, which shows that they have recognize that online teaching has its advantages in some aspects which cannot be ignored. The flexibility of online courses, the wide availability of resources, and the use of multimedia tools all provide students with lots of rich learning experience.

In this case, teachers may consider adopting a hybrid teaching model that combines offline classroom teaching with online resources. For example, key knowledge points can be explained in class, and relevant learning resources and online discussions can be provided through online platforms after class. In this way, students can not only enjoy the interaction of face-to-face teaching, but also use network resources to learn independently and expand their knowledge. In order to improve the quality of online teaching, teachers need to pay attention to the design of course content and the setting of interactive links, and use multimedia means and interactive tools to enhance students' sense of participation and learning enthusiasm.

In addition to classroom teaching, teachers can also encourage students to learn independently by recommending high-quality online learning resources, such as video courses and online experiment platforms. This can not only help

students better grasp the learning content, but also cultivate their independent learning ability and information acquisition ability. In the teaching process, teachers should encourage students to use network resources for extracurricular reading and study, and improve learning efficiency and effect through diversified learning methods.

B. Teacher-student Relationship and Learning Initiative

The relationship between teachers and students plays a vital role in students' learning enthusiasm. According to the survey data, 82.48% of the students became interested in the course because they liked a certain teacher, while 35.9% of the students lost interest in learning because they did not like a certain teacher. This shows that teachers are not only the transmitter who imparts knowledge, but also the important role of learning motivation. Good teacher-student relationship can enhance students' learning interest and enthusiasm, and improve their learning results.

In order to establish a good teacher-student relationship, teachers can interact and communicate with students in a variety of ways. For example, after-school tutoring, class activities and individual talks are effective means to enhance the relationship between teachers and students. Through these activities, teachers can better understand students' learning needs and difficulties, and provide targeted help and guidance. At the same time, teachers should pay attention to the interaction with students in class, stimulate students' thinking and participation through questions, discussions, case analysis and other ways, and enhance the interaction and activeness of the class.

In the teaching process, teachers should flexibly adjust the teaching methods and contents, according to the different characteristics and needs of students, teach students according to their aptitude. This can not only improve the learning effect of students, but also enhance their learning interest and enthusiasm. In addition, teachers should give students positive feedback in time during the teaching process, affirm their efforts and progress, and enhance their self-confidence and learning motivation. In these ways, teachers can effectively stimulate students' interest in learning, enhance their learning effect, and improve the overall teaching quality.

C. The Change of Learning Mode

Freshmen entered college from high school face a major shift in learning patterns. According to the survey results, 88% of students feel that there is a significant difference between college learning and high school learning, but the specific learning mode is not clear. Most of the freshmen still continue the study habits of high school and have not fully adapted to the learning mode of college. This situation shows that there is an urgent need for adaptive guidance for students in their early years at university to help them make a smooth transition to the university learning environment.

In order to help freshmen adapt to the learning mode of university, teachers should introduce the characteristics and requirements of college learning to students and impart the methods and skills to adapt to college learning through special lectures and study guidance classes at the early stage of freshman enrollment. For example, you can explain how to

make a study plan, how to use library resources, and how to participate in academic activities. These instructions can not only help students quickly adapt to university study life, but also improve their learning efficiency and autonomy.

In addition, teachers should guide students to gradually develop the habit of independent learning. This can be done in a number of ways, such as assigning assignments and projects that need to be done independently, and encouraging students to find information and conduct research on their own. In the teaching process, teachers can recommend some high-quality learning resources, such as books, journals, online courses, etc., to help students expand their knowledge and improve their independent learning ability. In order to ensure the learning effect of students, teachers should regularly evaluate the learning situation of students, timely find problems and provide targeted guidance to help students smoothly transition to the learning mode of the university.

D. Learning Behavior and Learning Methods

Freshmen show some common characteristics in their learning behaviors and methods. The results of the survey show that freshmen prefer teamwork and face-to-face on-site teaching respectively, with 78 percent of students believing that face-to-face teaching is better and 65 percent preferring to study with other students. This shows that group learning plays an important role in improving the learning effect. By interacting with classmates, students can motivate each other, make progress together, and enhance the enthusiasm and effect of learning.

In order to make full use of the advantages of group learning, teachers should design more interactive learning activities such as group discussion and project cooperation in teaching. Through these activities, students are not only able to learn and communicate in a team, but also develop teamwork and problem solving skills. When conducting on-site teaching, teachers should pay attention to the design of interactive links, stimulate students' thinking and participation through questioning, discussion, case analysis and other ways to improve the classroom teaching effect.

In the teaching process, teachers should also adopt a variety of teaching methods according to different course contents and students' needs. For example, we can try flipped classroom, situational teaching, experimental teaching, etc., and enhance the attractiveness and effect of teaching through different teaching forms. At the same time, teachers should encourage students to explore and try different learning methods, such as mind mapping, brainstorming, etc., to help them find the most suitable way of learning and improve learning efficiency and effect.

E. The Need for Guidance in Learning Methods

After entered the university, most freshmen still rely on the guidance of books and teachers, and be lack of more guidance on learning methods. According to the survey, more than 91% of students choose offline classroom learning, but the use of online multimedia resources is still insufficient. This shows that students have great room for improvement in learning methods and need more guidance and help from teachers in learning.

In order to help students master a variety of learning

methods, teachers can set up learning methods instruction classes to teach students how to read effectively, take notes, time management, and so on. These practical learning skills can not only improve students' learning ability, but also enhance their self-confidence and initiative for independent learning. In the teaching process, teachers should recommend some high-quality learning resources to students, such as books, journals, online courses, etc., to help them expand their knowledge and improve their independent learning ability.

In addition, teachers should guide students to use the Internet and multimedia resources to learn. For example, some assignments can be assigned that require searching for information through the Internet, and students can be encouraged to use Internet resources for extracurricular reading and research. In this way, students can not only learn to use modern scientific and technological means to acquire knowledge, but also improve their information literacy and self-learning ability. In actual teaching, teachers should constantly explore and try new teaching methods, adjust and optimize according to the specific situation of students, help students find the most suitable way of learning, and improve learning efficiency and effect.

F. The Impact of New College Campus Life and Environment on Learning

The survey shows that new students need academic guidance. 71% of the students believe that the new environment of college will cultivate their self-learning ability, while 65% of students think that the new environment in college may make them fish in troubled waters. 57% of the students felt that they had no direction to study and could not enter the right state, and 73.57% of the students had the idea or feeling that they needed to find teachers to guide them.

VI. TEACHING EMPHASIS BASED ON INVESTIGATION AND ANALYSIS

Through detailed investigation and analysis, we can identify the main challenges faced by new students in the learning process and formulate effective teaching strategies accordingly. The survey results show that freshmen have great needs in adapting to the university learning environment, changing the learning mode, establishing good teacher-student relationship and mastering diversified learning methods. These needs reflect common problems that freshmen face as they transition from high school to college. Based on these findings, teachers should focus on the following aspects when formulating teaching strategies in order to comprehensively improve teaching quality and students' learning effect.

Freshmen have some difficulties in adapting to the learning environment in college. When most freshmen first enter the university, they are not familiar with the learning mode and environment of the university, and they are easy to feel confused and at a loss. In order to help students adapt to college life as soon as possible, teachers should introduce the learning characteristics, teaching mode and utilization methods of campus resources to students through a series of adaptive guidance activities at the early stage of freshman enrollment. For example, activities such as special lectures, study guidance

classes and introduction of campus resources can be organized to help students understand how to make study plans, how to use library resources, and how to participate in academic activities. Through these guidance, students can not only better adapt to the learning environment of the university, but also improve the ability and efficiency of independent learning.

Students need more guidance and support in changing their learning patterns. The survey shows that most freshmen still continue their learning habits in high school when they first enter college, and they are unfamiliar with the learning mode of college. This situation requires teachers to help students gradually develop habits and methods to adapt to college learning in the teaching process. Teachers can teach students practical learning skills such as efficient reading, note-taking and time management through regular training in learning methods. In addition, teachers can assign some homework and projects that require students to complete independently, encourage students to search for materials and conduct research independently, and gradually cultivate their independent learning ability and critical thinking.

Good teacher-student relationship plays an important role in improving students' learning enthusiasm and effect. Surveys show that students' preferences for teachers have a direct impact on their level of interest and engagement in the curriculum. In order to establish a good teacher-student relationship, teachers should interact and communicate with students in various ways. For example, teachers can arrange time for individual tutoring after class, understand the difficulties and problems encountered by students in the learning process, and provide targeted help and guidance. In addition, teachers can also establish closer ties with students through class activities, extracurricular practices and other ways to enhance students' trust and closeness to teachers. Through these efforts, teachers can not only improve students' learning interest and enthusiasm, but also create a good learning atmosphere and promote the improvement of teaching effect.

In terms of the diversity of learning methods, teachers should actively guide students to try and master a variety of learning methods. The survey shows that most students still rely on traditional books and teachers and need more guidance in learning methods. In order to help students master a variety of learning methods, teachers can introduce novel teaching methods such as mind mapping, brainstorming, and flipped classroom into their teaching. These methods can not only enhance the interest and interaction of teaching, but also help students better understand and master the learning content. For example, through mind mapping, students can intuitively sort out the relationship between knowledge points and form a systematic knowledge structure; Through brainstorming, students can stimulate creative thinking and come up with more valuable questions and insights; Through flipped classroom, students can independently learn basic knowledge before class, conduct in-depth discussion and practice in class, and improve learning results.

In addition, teachers should also pay attention to the use of network and multimedia resources to help students expand the ways and methods of learning. The development of modern information technology provides rich resources and means for

teaching. Teachers can encourage students to use the Internet for extracurricular reading and research by recommending high-quality online learning resources, such as video courses and online experiment platforms. In this way, students can not only gain a wider range of knowledge, but also improve their information literacy and autonomous learning ability. In actual teaching, teachers should constantly explore and try new teaching methods, adjust and optimize according to the specific situation of students, help students find the most suitable way of learning, and improve learning efficiency and effect.

To sum up, based on the detailed investigation and analysis of freshmen's learning situation, teachers should focus on helping students adapt to university learning environment, change learning mode, establish good teacher-student relationship and master diversified learning methods when formulating teaching strategies. Through these targeted teaching strategies, not only can improve students' learning enthusiasm and effect, but also significantly improve the overall teaching quality, and lay a solid foundation for training high-quality talents to meet the needs of society.

VII. CONCLUSION

For freshmen, the courses in the first semester are very important for their studies. Course teachers should conduct detailed and accurate research on learning conditions, and understand the real needs of students through investigation and research. On this basis, they should conduct targeted study guidance and course teaching. In this way, teachers can play a better role and students can benefit more. In this case, through the investigation of learning situation, the conclusion is drawn that freshmen urgently need to improve their learning methods, integrate into the interactive learning environment, and urgently seek the intervention and guidance of teachers. This provides a good basis for teachers to teach, and teachers can focus on teaching activities. Grassroots teachers are not only for students to attend classes, but also to investigate the students' learning situation, adjust the teaching method according to the students' learning situation, and increase the teaching content in order to better serve the students and promote the students to learn more effectively. On the other hand, it also improves the teaching quality.

REFERENCES

- [1] Troussas.C, Krouska.A, Sgouropoulou.C, "A Novel Teaching Strategy Through Adaptive Learning Activities for Computer Programming", *IEEE TRANSACTIONS ON EDUCATION*, vol. 64(2), pp. 103-109, May 2021.
<https://doi.org/10.1109/TE.2020.3012744>
- [2] Shahsavari.H, Zare.Z, Parsa-Yekta.Z, Griffiths.P, Va lysis", *RESEARCH AND THEORY FOR NURSING PRACTICE*, vol. 32(1), pp. 23-45, 2018.
<https://doi.org/10.1891/1541-6577.32.1.23>
- [3] Jackson.D, Peters.K, Andrew.S, Daly.J, Gray.J, Halcomb.E, "Walking alongside: a qualitative study of the experiences and perceptions of academic nurse mentors supporting early career nurse academics", *CONTEMPORARY NURSE*, vol. 51(1), pp. 69-82, July 2021.
<https://doi.org/10.1080/10376178.2015.1081256>
- [4] Chase.CC, Marks.J, Malkiewich.LJ, Connolly.H, "How teacher talk guidance during Invention activities shapes students' cognitive engagement and transfer", *INTERNATIONAL JOURNAL OF STEM EDUCATION*, vol. 6, May 2019.
<https://doi.org/10.1186/s40594-019-0170-7>