

Evaluation and Analysis of Dual Degree Study of Logistics Engineering Students based on New Engineering Concept

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Abstract: Logistics engineering, a new subject, its teaching mode is in the stage of exploration. Logistics engineering major of Wuhan University of Science and Technology has developed a new education mode based on the dual degree, which aims to realize the dual role of training professional talents and reducing the burden of students. To test the trial effect of the dual degree, online questionnaire survey, including learning motivation, learning effect, teaching process, etc., is conducted for the students who have participated in the dual degree and those who have not yet registered. Mathematical statistics were used to summarize and analyze the questionnaire results. The teachers of our college have gained teaching suggestions and improvement directions thanks to this paper, and at the same time, teachers of logistics engineering major in other universities can also get new teaching ideas from this research.

1. Introduction

The definition of Logistics is that ‘the organization, planning, implementation and control of the acquisition, transport and storage activities from the purchase of raw materials up to the delivery of finished products to the customers’. And the logistics engineering means to optimize the logistics system with engineering analysis and planning ways. However, nowadays, logistics engineering is emerging as a discipline resulted from the increasing importance to the gross economy. Different from various other general disciplines, logistics engineering entails the integration of engineering science, management science, information science, economy science and so on, which is described with a word ‘inter-disciplinary.’^[1] Combined with this characteristic, more and more college students study for the dual degree to reflect its core areas of interest and basic orientation to a large extent.

Logistics engineering is a new discipline, and the first was established in 2002 with the Chinese Ministry of education’ approve.^[2] As an interdisciplinary, logistics is closely related to the new engineering specialties.^[3] We should build the teaching system of special practice.^[4] At present, the main modes of logistic degree education in Germany are the Otto—Von—Gulick University of Magdeburg I mode and the Dortmund University Y mode. University of Magdeburg adopts project teaching, simulation teaching, online teaching and other teaching methods in logistics teaching, focusing on academic training of logistics professionals’ personal ability, behavioral ability, professional ability and social ability.^[5] Besides, the dual degree is engaged in undergraduate students of many colleges, which could cultivate lots of specialized person-raise pattern of multi-skill innovation talent.^[6] The logistics engineering discipline at Wuhan University of Science and Technology has developed an entirely new education mode, named ‘new engineering specialties plus dual degree’. To implement it more effectively, the study motivation and process effect will be discussed.

2. Research Methodology

2.1. Participants

The target population of the study is 2018 and 2019 undergraduate students from Wuhan University of Science and Technology. The sample size was 150, of which 48% were at grade 18, and the rest were at grade 19, with a male to female ratio of 3:2.

2.2. Data Analysis

According to whether or not to register for the dual degree, two groups are divided into the students who have registered for the dual degree at present and those who have not yet participated. Taking into account the characteristics of different groups, two questionnaires were made and distributed and collected using the "Questionnaire Star" software. And the selection of questionnaire indicators combined with two relevant literatures^[7-8]. The students who are in the dual degree course mainly conducted the investigation of learning motivation, learning effect and teaching process. The other group was only asked about their motivation.

3. Results

3.1. Study Motivation Analysis of Non-elective Dual Degree Students

Table 1 Analysis table for students who have not yet chosen a dual degree

items	Students' attitudes	N	%
The primary consideration when choosing to apply for a dual degree	I am interested and have plenty of time	33	35.87%
	The first major is not ideal, so I want to find a better development direction	28	30.43%
	It is helpful for the study of the major	10	10.87%
	I want to learn more things to enrich myself	15	16.30%
	others	6	6.52%
Secondary factors to consider when applying for a dual degree	I am interested and have plenty of time	36	39.13%
	The first major is not ideal, so I want to find a better development direction	14	15.22%
	It is helpful for the study of the major	15	16.30%
	I want to learn more things to enrich myself	20	21.74%
	others	7	7.61%
Reasons not to choose a dual degree	My major courses and related tasks are heavy, unable to take into account the dual degree	80	86.96%
	I don't think it is necessary to study for a dual degree.		
	The dual degree certificate is not valuable and not helpful for job-hunting	30	32.61%
	My major has good prospects and I don't need a dual major	6	6.52%
	It will cause great economic pressure	13	14%
	After a detailed understanding of the course, my interest in this major decreased	23	25%
	The school has a high threshold for dual degree programs	5	5.43%

The results of the study motivation survey for students who did not choose any second degree are shown in Table 1. According to the questionnaire, when applying for a dual degree, whether one is interested and whether he has enough time is crucial. 35.87% of the students think it should be considered first, while 39.13% of the students think it should be given second attention. The results show that when people are not satisfied with their first major, the other development direction -- the

second degree is often looked for, of which 30.43% of the students think so. From a personal development point of view, the ability to enrich oneself or the ability of a second degree to complement a major also plays a role in the student's decision to participate in a second major.

As for the reasons for not choosing, 86.96% of the students said that they could not take into account the dual degree because of the heavy courses and related tasks of their major; 32.61% of them thought that the value of dual degree certificate was not high and there was no need to study for it.

3.2. Analysis of Students Who Have Already Chosen a Dual Degree

3.2.1. Analysis of Learning Motivation

Table 2 Table of motivation analysis for dual degree study

items	Students' attitudes	N	%
The reason why you chose the dual major is	I am interested and have plenty of time	26	44.83%
	The first major is not ideal, so I want to find a better development direction	17	29.31%
	It is helpful for the study of the major	35	60.34%
	I can learn more things to enrich myself	28	48.28%
	It will be helpful for future study and job hunting	36	62.07%
	I will be influenced by my parents to learn this subject	4	6.90%
	There are many students around me who choose dual degree	2	3.45%
	I took my teacher's advice	12	20.69%
	others	1	1.72%
The first criteria you meet when choosing a dual major are	I choose the major I am interested in	18	31.03%
	I choose a popular major that is friendly to employment	18	31.03%
	I pay more attention to whether it can be combined with the original major	22	37.93%

As shown in table 2, different from the students who did not choose the idea, most of the students who have participated in this activity are in line with the idea that it will have advantages for future work and job hunting and will be helpful to the major study; Then they will consider whether they can enrich themselves; Only a small number of people find another career because their first major is not ideal.

When filling in the volunteer, 37.93% of people choose one that can be better combined with their major; For the rest, the major I am interested in and the popular one that is friendly to employment are equally divided, accounting for 31.03% , respectively.

3.2.2. Evaluation of the Learning Effect of Dual Degree Courses

With the experience of dual degree, students generally believe that their job hunting road has a layer of security, accounting for 72.41%. In this process, both personal qualities, deposits and comprehensive abilities have been qualitatively improved. Not only that, many unexpected surprises were also obtained. For example, the perspective of problems was broadened (50%), the ability to study and bear hardships was improved (37.93%), and the ability to arrange time properly was enhanced (32.76%).

Normally, they have had their share of challenges. It's hard to do twice as much work as

everyone else. It is difficult to balance the relationship between two majors that most people face (63.79%). Taken together, time constraints and heavy tasks are the root causes of these difficulties.

In the end, the majority (74.14%) succeeded in overcoming the obstacles, and their performance remained unchanged. Surprisingly, some (5.17%) even improved their grades; However, another group (20.69%) saw their performance decline.

Table 3 Table of analysis of learning effect of dual degree

items	Students' attitudes	N	%
What do you feel you have gained after taking the dual major	The dual degree has improved my personal quality and increased my personal background	35	60.34 %
	It makes me closer to the direction of compound talents and increases my job-seeking hair code	42	72.41 %
	I have more classmates or friends in different majors	17	29.31 %
	It increased my knowledge experience and enhanced my comprehensive ability	35	60.34 %
	It exercises the ability to learn and the ability to bear hardships	22	37.93 %
	It has enhanced my ability to manage my time well	19	32.76 %
	The understanding of different disciplines and the Angle of looking at problems have been broadened	29	50%
What do you think is the biggest challenge of taking the dual major	Dual degree courses are difficult	12	20.69 %
	Dual degree takes up too much time and energy, it is difficult to deal with the relationship with the study of this major	37	63.79 %
	Students have too much work, competitions, etc., and not enough time	22	37.93 %
	The dual degree causes severe physical exertion, and the class time is too long, leading to hard work and lack of sleep	14	24.14 %
	I had to give up a lot of fun	18	31.03 %
	others	5	31.03 %
Is there any change in your previous major scores after taking the dual major	My grades have improved	3	5.17%
	My grades have slipped	12	20.69 %
	My grades have stayed pretty much the same	43	74.14 %

3.2.3. Evaluation of the Teaching Process of Dual Degree Courses

As shown in Table 4, the school's teaching facilities, assessment methods, practicability of teaching materials, class and examination arrangements, teachers' teaching level and problem-solving attitude have been highly praised by students. Further improvement can be made in teaching methods, teaching organization and management. In general, the time cost of taking a dual degree is within the acceptable range of students.

Table 4 Table of analysis of the teaching process of dual degree

items	Very good		good		general		poor		Very poor	
	N	%	N	%	N	%	N	%	N	%
Teaching facilities and other hardware	12	20.69%	29	50%	17	29.31%	0	0%	0	0%
Teaching level	16	27.59%	16	48.28%	14	24.14%	0	0%	0	0%
Teaching methods and means	17	29.31%	24	41.38%	15	25.86%	2	3.45%	0	0%
The teaching effect	13	22.41%	26	44.83%	17	29.31%	2	3.45%	0	0%
The teacher's problem-solving attitude	17	29.31%	31	53.45%	10	17.24%	0	0%	0	0%
Teaching organization and management	16	27.59%	29	50%	10	17.24%	3	5.17%	0	0%
The assessment method	14	24.14%	30	51.72%	13	22.41%	1	1.72%	0	1.72%
practical value of teaching materials	14	24.14%	32	55.17%	11	18.97%	1	1.72%	0	0%
Schedule of classes and exams	16	27.59%	33	56.90%	33	13.79%	1	1.72%	0	0%
Cost of class time	13	22.41%	34	58.62%	9	15.52%	2	3.45%	2	0%

4. Conclusion

The conclusions of this paper are as follows:

(1) Students who major in one major have different ideas from those who have already chosen a dual major. The former attach more importance to personal interests and hobbies, and if they have enough time, they will decide whether to pursue it or not according to their satisfaction with their first major. The latter are more likely to lay a foundation for their future work and choose another subject that is helpful to their major.

(2) The survey shows that the study of dual degree makes most students gain a lot, but they are faced with many challenges, which are affected by the time.

(3) On the whole, the school's teaching facilities and teachers are recognized by the students. However, it is not good in teaching methods, teaching organization and management and needs to be improved in the future.

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