

An Investigation on the Internship Difficulties of the Students Majoring in Mathematics in Chinese Normal Universities

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Abstract

Educational practicum is an important activity for the students majoring in Mathematics in Chinese normal universities. During this process, numerous interns feel not adapted to the work. According to a questionnaire survey of interns majoring in Mathematics in four normal universities in China, it is found the difficulties they have encountered in the internship process mainly are the problems related to practical teachings, such as: How do they prepare for teaching before class? How do they teach in class in a flexible way? And how do they evaluate students' performance after class? etc. It indicates that the current students of mathematics major in normal universities do not familiar with the school teaching practice, do not understand the characteristics of real middle school students, the textbook and the classroom, do not master the practical mathematics teaching skills and teaching research way yet. Therefore, it is suggested to develop more practical teaching courses of students in normal universities, reform the teaching of normal universities actively, so as to enhance the teaching skills of normal students, strengthen the guidance teachers' force of education. Additionally, it is suggested to encourage interns to learn actively during the internship, ask for advice from the guidance teachers and listen to their lectures frequently.

Keywords

Normal University, Normal Students, Mathematics Education, Educational Internship

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1. Introduction

The educational internship is an important part of practical learning for normal students majoring in Mathematics in Chinese normal universities [1]. In this process, students can not only apply the mathematics knowledge and teaching knowledge which is learned previously to practice, test and improve their ability of combining the theories and practice, but also fully understand the actual situation of middle school mathematics teaching, follow the front-line teachers to learn some practical skills that cannot be learned in the university classroom and lay a solid foundation for their own practical teaching in the future [2]. Consequently, for a long time, the educational internship has been attached great importance to

by normal teachers and students. Before the starting, normal colleges and universities generally provide some corresponding courses, to teach relevant knowledge and demand many related exercises, such as Microteaching and Simulation Teaching [2]. However, in spite of this, there are still many students who often feel overwhelmed and unadapted in the process of internship [3] and are often don't know what to do about preparing lessons, teaching, and tutoring [4-13]. So, in what ways do they have difficulties? There has been no relevant research so far, and it is undoubtedly meaningful to help them overcome all kinds of maladaptation. Therefore, we conducted an investigation to resolve these problems.

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2. Methods

2.1. Samples

In order to make the sample more representative, this study selected 412 normal students totally majoring in mathematics from four normal universities in Shanghai, Chongqing, Jinan, and Liaocheng in China. These normal students just finished educational internships, in which there are 198 males and 204 females, 257 students doing internships in junior high school, 155 students doing internships in Senior High School. Their average age was 23.1 years old.

2.2. Instrument

We employed a self-designed questionnaire based on relevant materials as the instrument. The questions on the questionnaire mainly belong to the following five aspects: pre-class preparation, classroom teaching, homework review after teaching, evaluation, and research of mathematics teaching. The reason for investigating the situation about these 5 aspects is that the activities which normal students did during their internships generally are classified into these 5 aspects. After the questionnaire was formed, it was revised three times according to the suggestions of experts, and finally achieved good reliability and validity.

2.3. Data Collection

The questionnaire was sent by the researcher to the normal university students who were selected in advance via email, and they were asked to return it within one week. A total of

412 questionnaires were sent, 396 of them were returned, 16 of them were rejected for its incompleteness, and 380 valid questionnaires were collected totally.

2.4. Data Analysis

We firstly sorted these valid questionnaires and made clear the meaning of answers of each student, then we applied NVivo software to analyze the content of the questionnaire by the way of coding. In order to maintain the objectivity and reliability of the code in this process, we invited two experienced experts to code independently. After that, we compared their coding system at first and retained the same codes, and discussed the different codes with them in detail. Finally, we adjusted their coding systems under their agreement to make their coding system be fully consistent.

3. Results

3.1. Pre-class Preparation

The pre-class preparation plays an important role in subsequent teaching. According to statistical data, it is found that almost one-third of the students have difficulties in the research of textbooks and the design of the writing on the blackboard. Comparing the situation between males and females, it can be seen that most difficulties mentioned above are encountered by females. We conduct a Chi-square test on male and female students, then a significant difference was found ($\chi^2 = 29.928$, sig = 0.000). The detailed data are shown in Table 1.

Table 1. The difficulties during Pre-class preparation.

Code	Females		Males		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Textbook research	95	25	20	5.3	115	30.2
Blackboard writing design	83	22	12	1.6	95	25
Teaching equipment	32	8.4	24	3.2	56	14.7
Understanding of the student learning	22	5.8	18	2.4	40	10.5

3.2. Classroom Teaching

The classroom teaching is the main work of interns. According to the investigation, it can be found that approximately two-thirds of the interns have difficulties in controlling classroom discipline, more than one-third of the

interns have difficulties in improving students' interest in mathematics learning. Although most of the students who had difficulties in these two aspects are female students, the Chi-square test is performed on male and female students and showed that there is no significant difference between them ($\chi^2 = 15.366$, sig = 0.081). The detailed data are shown in Table 2.

Table 2. The difficulties facing classroom teaching.

Code	Females		Males		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Proper expression for conveying the ideas	21	5.5	12	1.6	33	8.7
Mastery of classroom rhythm	9	2.4	4	0.5	13	3.4
Mastery of classroom discipline	152	40	86	11.3	238	62.6
Discussion-based teaching	20	5.3	4	0	24	6.3
Adjustment of own mood in class	18	4.7	14	1.8	32	8.4

Code	Females		Males		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Using teaching equipment	8	2.1	4	0.5	12	3.2
Arousing students' enthusiasm for learning	9	2.4	8	1.1	17	4.5
Improving students' learning interest	68	17.9	32	4.2	100	38
Adjusting classroom atmosphere	10	2.6	5	0	15	3.9
Clearing relationship of students and teachers	5	0	12	1.6	17	4.5

3.3. Arrangement and Correction of Students' Assignments

Giving and correcting homework is one of the necessary tasks for mathematics teachers after class. According to the survey, 72.9% of the interns have difficulties in controlling the amount of homework; 55.8% of the interns have difficulties in finding students' learning problems through homework; 47.9% of the interns have difficulties in communicating with their

students about their homework after class; 38% of the interns have difficulties in giving proper comments for correction. Compared with the situation of males and females, it can be found that the percentage of the above-mentioned four difficulties is also higher for females than for males. Chi-square test showed that there is a significant difference between females than for males ($\chi^2 = 34.631$, SIG = 0.000). The detailed data are shown in Table 3.

Table 3. The difficulties with students' assignments.

Code	Females		Males		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Extending the problems	10	2.6	8	0	18	4.7
Standardizing own blackboard writing	22	5.8	38	5	60	15.8
Mastering the standard of correction	30	7.9	22	2.9	52	13.7
Communicating with students after class	78	20.5	104	13.7	182	47.9
Counting the student's mistakes	21	5.5	20	2.6	41	10.8
Providing proper suggestions	54	14.2	46	6.1	100	38
Finding time to correct	9	2.3	22	2.9	31	8.2
Designing the load of homework	127	33.4	150	19.7	277	72.9
Understanding students' thinking	30	7.9	42	5.5	72	18.9
Finding the learning problems by correcting	132	34.7	80	10.5	212	55.8
Assigning according to the base of students	10	2.6	4	0	14	3.7

3.4. The Evaluation in Mathematics Teaching

Testing is an indispensable part of teaching. According to the survey, almost half of the interns have difficulties in choosing targeted questions, one-third of them have difficulties in predicting the students' test scores, nearly one-quarter of them have difficulties in changing the test time flexibly and arranging courses according to the test results, and almost

one-fifth of them have difficulties in controlling the difficulty of the test questions. Comparing the situation of males and females, we can find that the items' proportion of females is higher than that of males, except for the teaching arrangement based on the test results. Chi-square test showed that there is a significant difference between them ($\chi^2 = 117.862$, sig = 0.000). The detailed data are shown in Table 4.

Table 4. The difficulties during assessing students.

Code	Females		Males		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Choosing proper problems	72	18.9	122	16.1	194	51.1
Choosing test time flexibly	37	9.7	60	7.9	97	25.5
Predicting students' performance	52	13.7	76	10	128	33.7
Designing teaching according to the test results	23	6.05	82	10.8	105	27.6
Testing according to students' learning	22	6.1	12	1.6	34	8.9
Analyzing the learning problem of students according to their test results	23	6.05	40	5.3	63	16.6
Mastering the difficulty degree of test	55	14.5	26	3.4	81	21.3
Mastering the load of test	36	9.5	24	3.2	60	15.8
Clearing the standard of test	32	8.4	18	2.4	50	13.2
Facing students' results with proper attitude	18	4.7	4	0.5	22	5.8
Counting test results	27	7.1	12	1.6	39	10.3
Analyzing the test mind of students	38	10	20	2.6	58	15.3
Improving own ability of control	19	5	0	0	19	5

3.5. Research Activities in Mathematics Teaching

The difficulties encountered by the interns in the research activities after mathematics teaching include four parts: the time arrangement and forms of the research activities, the experience, and reflection in mathematics teaching obtained in the research. According to the survey, it was found that 84.7% of interns have difficulties in reflecting oneself timely, 62.4% of them have difficulties in the experience, 59.7% of them have difficulties in arranging the research activities reasonably,

and 57.9% have difficulties in doing what they want and execution, 24.2% have difficulties in adapting to the form of the research activities. Comparing the situation of males and females, it is found that the number of males who think the form of the research activities in teaching is monotonous is higher than that of females, but as for the other four difficulties, females' number is more than males' number. Chi-square test showed that there is a significant difference between the females and males ($\chi^2=84.362$, sig = 0.000). The survey data are shown in Table 5.

Table 5. The difficulties facing teaching research.

Code	Females		Males		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Arranging the research time rationally	125	32.9	102	13.4	227	59.7
Communicating the experience of teaching	89	23.4	148	19.5	237	62.4
Determining the way of research	12	3.2	80	10.5	92	24.2
Rethinking on time	128	33.7	194	25.5	322	84.7
Doing as planning	136	35.8	84	11.1	220	57.9

4. Discussion

Through the investigation and analysis above, it can be seen that the biggest difficulty that interns encounter during the pre-class preparation is researching on the teaching materials, and then designing of blackboard writing and understanding students' learning situation. It indicates that normal students are not proficient in the study and practice of pre-class preparation.

Regarding the classroom teaching, on one hand, the biggest difficulty for interns is controlling classroom discipline, and at the same time, it is also a great challenge to improve students' interest in learning. On the other hand, there are fewer difficulties for interns on how to adjust the class atmosphere, how to use teaching equipment, and how to master the rhythm of the class. This interprets that the interns can not deal with the teaching in class flexibly, and also reflects the serious lack of internship in-classroom experience.

Controlling the amount of homework, communicating with students after class, finding students' problems through their homework and giving it an appropriate time to correct are the major problems for interns in arranging the assignments, in which the biggest difficulty is controlling the amount of homework. A large amount of homework may not improve students' grades. The control of the amount of homework depends on the teacher's understanding of the students' learning situation and the difficulty of the homework. Therefore, this reflects the interns can not fully understand the characteristics of students' learning.

Through this investigation, it can be seen that the interns'

problems about testing their students are relatively scattered, and there is not a problem that is too concentrated, which also reflects it exists many problems in the aspect of testing students. The biggest problem encountered was choosing targeted questions, followed by predicting the performance of student tests. This is similar to the problem of controlling the amount of homework in the aspect of arranging the assignments above. This further reflects that the interns can not fully understand the characteristics of students' learning.

The difficulties encountered by interns in research activities in teaching are relatively scattered. Among them, the biggest difficulty encountered is that they cannot reflect themselves in time. The current internship situation may be the key reason because they are often not invited to participate in the research activities in the school.

5. Conclusion

Through the analysis above, it can be seen that the students of mathematics majors in normal universities do encounter many difficulties. However, what they met mainly are the problem related to practical teaching. From them, it could be seen that the students of mathematics major in normal universities do not familiar with the school teaching practice, do not understand the characteristics of real middle school students, the textbook and the classroom, do not master the practical mathematics teaching skill and teaching research way yet.

In view of this, we suggest in the normal colleges or universities we should: (1) set up specialized courses for training professional teachers to help students to study on how to prepare lessons, how to take lessons, and how to find key

points and difficult points in teaching; (2) reform the teaching of normal universities actively to let students know how to take a good lesson and carry out more simulation teaching before the formal internship; (3) actively guide the guidance teachers of internship schools to play a greater role to help students to know how to grasp the key and difficult points in the classroom teaching and how to correct and assign homework, etc. Additionally, it is suggested to encourage interns to learn actively during the internship, ask for advice from the guidance teachers and listen to their lectures frequently.

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