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Research Article

A COLLABORATIVE MODEL BETWEEN TEACHERS – STUDENT TEACHERS – LECTURERS DURING THE MATHEMATIC PEDAGOGICAL PRACTICUM IN HO CHI MINH CITY UNIVERSITY OF EDUCATION

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ABSTRACT

Many universities of education in Vietnam have a long history of development, following the French ENS model. In this model, the training of teachers in general, and Math teachers, in particular, focuses mainly on pure mathematical knowledge. During the past ten years, with the pressure of change from the Ministry of Education and Training, professional training has been receiving more and more attention. The proportion of subjects related to Education and Math Education has been increasing, although it is still small compared to the proportion of pure Mathematics modules. In this context, Ho Chi Minh City University of Education decided to observe student teachers' teaching practice during the practicum in high schools. In order to analyze this practice, a model has been developed, a collaboration model of various stakeholders. Data were then analyzed using supervisors' reports. The results show that there is an improvement in the level of involvement of lecturers as supervisors in this collaborative model.

Keywords: collaboration; student teachers; pedagogical practicum; teacher training

1. Introduction

Teacher training is one of the factors that determine the quality of education. It is a long-term process that requires much cooperation with many intertwined connections (Tran, 2012). It not only takes place on the campus of universities of education but also takes place outside the teaching universities, cooperating with various stakeholders. In this article, we will discuss the practicum period of student teachers in high schools where

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student teachers may encounter some kinds of conflicts. The conflicts and the complex system of high schools may have impacts on student teachers. For example, conflicts between pedagogical theories that students are trained at universities of education with practical teaching in schools; between new perspectives, teaching methods, and traditions. We will analyze whether student teachers were prepared for such conflicts (first question - Q1).

In contrast to the challenges, the practicum, however, is also an opportunity for both universities of education and high schools. They can reflect on their professional activities. For the universities, they may ask questions whether their pedagogical training has met the social and market demands in the field of education. For the schools, this is an opportunity for them to learn from student teachers: updating their views, methods, tools, or solutions... In this paper, we attempt to find an answer for the question, "Is collaboration between high school teachers, student teachers, and tertiary lecturers during the practicum effective as an opportunity for development for both sides?" (second question - Q2)

Besides, cooperation takes place not only vertically between the university of education and the high school but also horizontally among different disciplines. It is particularly meaningful in the context of Vietnamese education which is now undergoing significant innovation, a shift from a content approach to a competence approach. In this context, many new teaching approaches have been introduced: integrated teaching, interdisciplinary teaching, or STEM and the like. Educators have affirmed that there must be a collaboration between lecturers and teachers of the subjects, who both used to work separately, to ensure the success of the educational reform in Vietnam. How does the collaboration between lecturers/teachers of different subjects happen during the practicum of students? (third question - Q3)

In this article, we will report the collaborations (Figure 1), between the student teachers of the Department of Mathematics and Information, Ho Chi Minh City University of Education (Vietnam) with high school teachers and lecturers of the department during their practicum. We begin by introducing a model of teacher training at the university, in particular the model of pedagogical practice. We have specific questions related to the collaboration. Finally, by analyzing data of the practicum and lecturers' assessment reports, we will discuss some possible answers to the above questions.

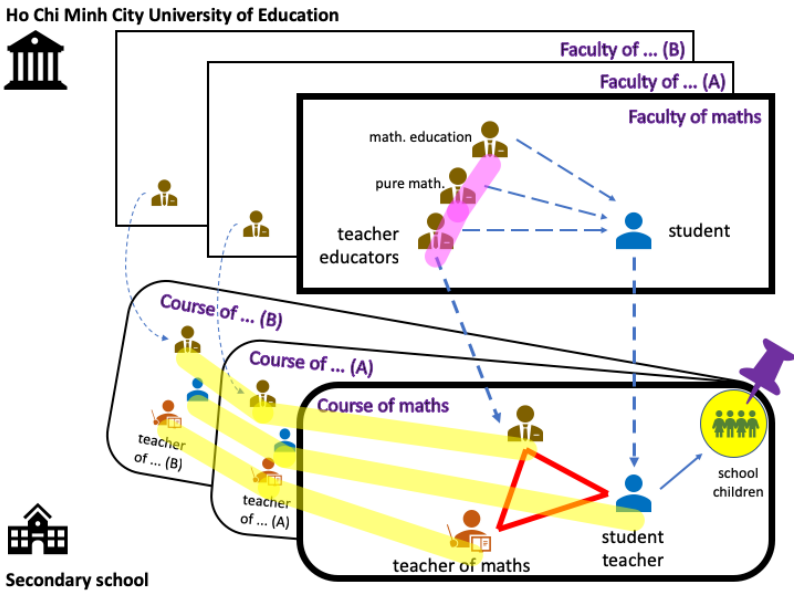

Figure 1. *Schema of components in pedagogical practicum*

2. Collaboration during practicum

2.1. Model of teacher training at Ho Chi Minh City University of Education

The Department of Mathematics and Information, Ho Chi Minh City University of Education enrolls students who graduate from high school and meet the university's predefined selection criteria, in particular the total marks of three subjects - Math-Physics-Chemistry. For the undergraduate program of Teaching Mathematics (Ho Chi Minh City University of Education, 2016), students must complete 135 credits of different courses: 116 credits for compulsory subjects, 11 credits for elective subjects (including graduation thesis), and 8 credits for practicum in high schools. In terms of content, these courses can be divided into three categories: General, Pure mathematics, and Mathematics education.

- General education: providing general knowledge of philosophy, law, informatics, foreign language, and some specialized pedagogical knowledge such as psychology, education.

- Pure mathematics education: providing pure mathematics knowledge in four sub-disciplines: Calculus, Algebra, Geometry, Applied Mathematics.

- Professional/Pedagogical Mathematics education: providing knowledge and practice in teaching mathematics, including Introduction of didactics of mathematics, Didactic of Algebra and Calculus, Didactic of Geometry, Testing and Assessment of mathematics in high school, Application of technology in teaching mathematics in high school, Theory of didactical situations, Basis of secondary mathematics education, Mathematics curriculum development in high school, Practical activities in mathematics teaching, and Construction and function of knowledge in teaching mathematics.

The total studying time can last up to 6 years. Theoretically, students can choose to study any course at any time of the program if they satisfy prerequisites. Below, we introduce a standardized process for students to complete a total of 135 credits in 8 semesters (4 years).

Table 1. *Distribution of credits in 8 semesters*

Semester	General	Pure mathematics	Mathematics education
1st	8	9	
2nd	10	12	
3rd	11	9	
4th	9	10	
5th		15	3
6th		5 (+5)[1]	8 (+5)[1]
7th		3 (+6)[2]	4 (+3)[2]
8th			
Total	38	63 (+5) (+6)	15 (+5) (+3)

The practicum is organized two times, the first one in semester 6 (2 credits) and the second in semester 8 (6 credits).

The table 1 shows that there are fewer courses for the Mathematics education those of the other two education stages.

The teacher education program has many similarities with the ones offered in many countries with two phases: Phase 1 provides student teachers new ideas and knowledge; Phase 2 puts them to the classroom to practice these ideas and knowledge. According to Takahashi (2015), lesson study, like a collaborative process, brings various benefits to phase 2: sharing views, deepening the teaching, implementing pedagogical ideas, and improving observation of classroom.

In the following section, we will discuss the collaborations during the practicum at Ho Chi Minh City University of Education.

2.2. Pedagogical practicum

According to Regulations on pedagogical practicum in teacher education according to the credit system (Ho Chi Minh City University of Education, 2014), the practicum takes place in a close coordination between Ho Chi Minh City University of Education (disciplinary departments) and local high schools (steering committee for practicum,

[1] Students choose 2 courses in the same group: Calculus, Algebra, Geometry, Applied Mathematics, Teaching Methods.

[2] Students can choose to write a graduation thesis (6 credits) or choose 2 out of 5 courses as an alternative to thesis writing (3 credits/course).

subject head, and instructors). Initially, students are often organized into a practicum team (which can include student teachers from one or many departments) with a university lecturer as the team representative. After that, the practicum team will go to high schools for 12 weeks (the first time) or 10 weeks (the second time). The practicum steering committee will assign high school teachers who have taught for more than five years, with good quality and professional ability to supervise the practicum by the students. At the end of the practicum, the instructors will evaluate the practicum using a given assessment forms and send them to the university.

The objectives of the practicum are:

- For the first practicum: Students will understand high schools and local education situations; Practicing teaching; Accumulating and practicing soft skills.
- For the second practicum: Students will prepare and plan to teach the subject, will practice teaching, examine and evaluate the results of studying and managing teaching files and researching education, accumulate and practice soft skills.

The content of mathematics teaching practicum is specified as follows:

- In the first practicum: Using appropriate methods and techniques to analyze students' educational levels, learning interests, and learning styles; Analyzing subject program and program distribution, preparation of subject skills; Practicing developing the program, proposing meaningful adjustments, based on reality; Observing at least 6 periods of high school teachers; Collecting and studying references; Preparing two lesson plans for two classes and conducting teaching practice; Deciding on the best lesson plan to teach in class.
- In the second practicum: Observing at least 8 periods of high school teachers; Observing lessons taught by students of the same department in the practicum team; Preparing lessons and conduct teaching at least 10 periods in front of other students of the same department; Teaching in class at least 10 periods.

Although the lesson study theory has never been officially announced in a teaching practicum, this model still has some similarities with lesson study in other countries. We do a comparison between eight steps of lesson study (Stigler, & Hiebert, 1999; Pang, & Marton, 2003) and the teaching practice process at Ho Chi Minh City University of Education (Figure 2). Collaboration happens during the observation of high school teachers teaching, student teachers teaching and follow-up discussion among the team. The collaboration also happens when student teachers practice their teaching in front of other students and follow-up discussions (3 days before class); The collaboration also take places when student teachers review their lesson plans with the instructor (2 days before class) and reflect on their teaching after each lesson. Noting that these experiences are helpful for all student teachers, especially for ones who teach the same lesson in another class.

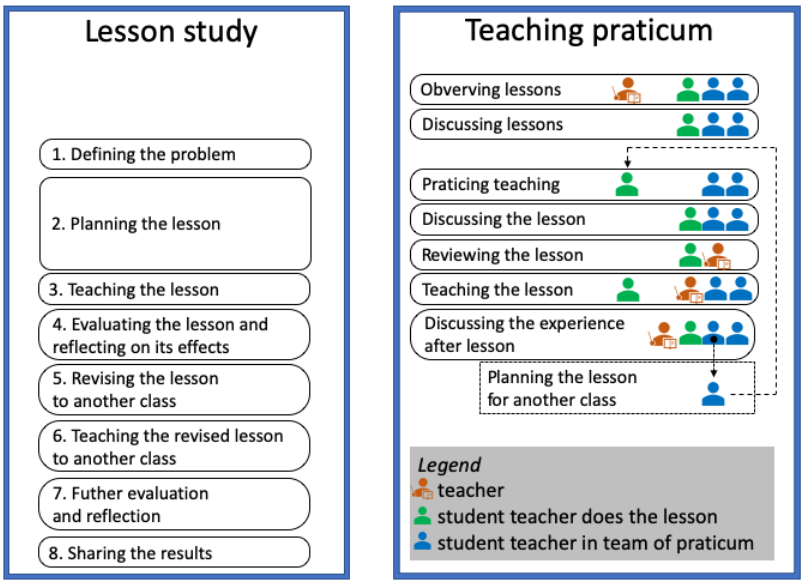

Figure 2. *Comparison between lesson study and teaching practicum process at Ho Chi Minh City University of Education*

Next, we will look at the criteria for evaluating the practicum to clarify the wishes of the university of education for the results of collaboration (Table 2).

Table 2. *Criteria for evaluating a teaching period*

Criterion		Indicators	Maximum score
Contents of the lesson	1	Ensuring the accuracy (in terms of disciplinary and political perspectives) and education.	2,0p
	2	Ensuring the systematicity, content layout, and clarification of key contents.	0,5p
	3	Ensuring consistency between theory and practice of the contents of the lesson.	0,5p
Teaching method	4	Using appropriate teaching methods to the objectives and the contents of the lesson.	1,5p
	5	Effectively combining teaching methods during the lesson.	0,5p
Teaching instruments	6	Presenting logically on the board with clear and standard spoken and written language.	1,5p
	7	Selecting and using effective teaching facilities and equipment appropriate with the contents of the lecture.	0,5p
Organization	8	Stimulating students to be active, positive, and cooperative in learning.	0,5p
	9	Flexibly applying the steps in class and reasonably distributing time for the contents of the lecture.	1,5p
Results	10	Students understand and master the objectives of the lesson.	1,0p

Besides, during the second practicum, the department of Mathematics and Informatics will go to high schools to observe lessons taught by students of the department. After the lesson, lecturers, high school teachers, and students will discuss and reflect on the lessons that have just been taught. Next, the lecturers will write a report and send it to the department and the school. The assessment criteria include mastering the objectives and knowledge of the lesson; applying teaching methods; design and use of teaching facilities; pedagogical skills such as presentation, expression. Students will also receive a separate assessment from the school during the practicum.

2.3. Comments and questions during the collaboration

This practicum model shows that the collaboration activities on mathematics teaching only take place between lecturers, students, and math teachers at high schools. Due to the lack of mechanisms for cooperation, non-math stakeholders groups (lecturers, students of other departments, and teachers of other disciplines) were not involved during the practicum (Figure 3). This will be a challenge for the education reform in Vietnam towards the orientation of integrated and interdisciplinary teaching.

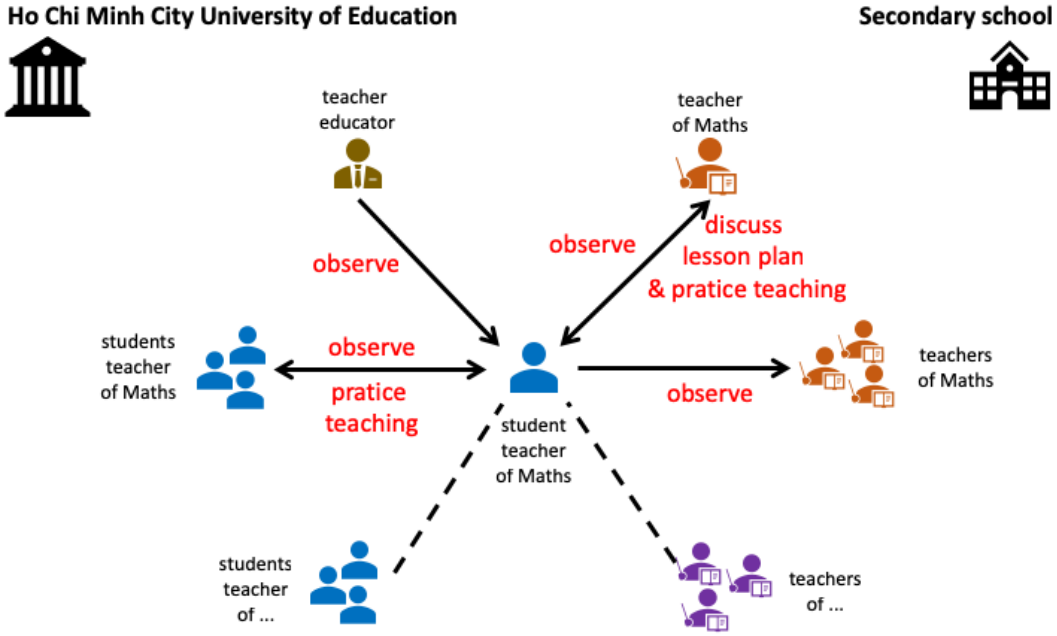

Figure 3. *Collaborations during the period of teaching practice*

One possible solution in this situation (Q3) is that the university of education and the high school agree on the common professional activities, which require the collaboration of many different disciplines during teaching.

On the other hand, the practicum model presented above opens up more specific questions for the original Q1:

Q1a: What are the similarities and differences in content, methods, means, and organization of teaching during the discussion between teachers and student teachers when developing and modifying lesson plans before each teaching period of the student teacher? between teachers and lecturers during the discussion after the student teacher's lesson?

Q1b: In the situation of many different opinions, what will be a principle for an agreement, for a final decision on the student teacher's lesson?

In order to answer the above question, we need to observe (with videos) and then analyze the discussions between teachers, student teachers, and lecturers during the collaboration.

In addition, because the evaluation of lecturers does not affect students' scores, it somehow affects the purposes of lecturers going to high school to observe classes and discuss with student teachers and high school teachers. For the initial Q2, to what extent this observation can help in student teacher's career development (Q2a)? reviewing lecturer's training practice (Q2b)? high school teacher's instruction (Q2c)?

In order to thoroughly answer the above questions, there is a need for long-term studies on the impacts after the practicum for all sides. In the first phase, we will only analyze the lesson evaluation form, the general assessment on the quality of teaching practice form and the summary report on the practicum of the Department of Mathematics and Informatics, Ho Chi Minh City University of Education for the practicum of the school year 2018-2019. These are the documents that lecturers and departments need to complete and submit to the university. These are the evidence for lecturers and departments to propose a review on the collaboration and resources for collaboration improve the quality of training (Q2b), such as changing the way of collecting information, practicum organization, coordination with high school, and teaching Pure Mathematics and Mathematics Education courses.

3. Evaluation of the results of collaboration via lecturers' practicum assessment report

Seven evaluation forms were analyzed in this section based on 21 lessons at 9 high schools in Ho Chi Minh City. These lecturers are coded as TE1, TE2, ..., and TE7. Table 3 summarizes demographic information relating to the seven lecturers.

Table 3. *Basis information of the lecturers joing the study*

Major	**Teaching experience**	
	Below 10 years	Above 10 years
Pure Mathematics	TE1, TE2	TE3, TE4, TE5
Mathematics Education	TE6	TE7

We will summarize the issues that the lecturers mentioned in the form provided by Ho Chi Minh City University of Education.

Regarding mastering the objectives and knowledge of the lesson, the lecturers all reported the student teachers' mastery of the objectives of the lesson and the accuracy of math knowledge in the teaching period. In addition, TE1 and TE2 were concerned about the balance between the theory and the exercises (practice); TE5 paid attention to how to lead and present contents to achieve the goals of teaching.

Regarding the practice of teaching methods, all lecturers reported students's use of appropriate methods during the class to help high school students learn. However, there is a difference between the more experienced Pure Mathematics lecturers (TE3, TE4, TE5) and Mathematics Education lecturers (TE6, TE7). TE6 and TE7 commented in detail the methods from a process perspective and paid attention to positive methods. Meanwhile TE3, TE4, and TE5 only commented on traditional teaching methods (presentations, questions) with theoretical teaching and homework. In addition, TE1 and TE7 showed interest in creating motivation for learning a new math knowledge. TE7 was more interested in the real-life association in the lesson.

Regarding the design and use of teaching facilities, all lecturers reported on the use of traditional teaching facilities (rulers, compasses) and paid attention to student teachers' ability to use informatics media in teaching mathematics. Regarding the presentation and oral skills, all lecturers recorded the same interest. As regards the presentation on the board, the assessment includes arranging the layout of headings, content, writing, drawings, using colored chalk, saving space, clearing the board. As regards oral skills the assessment includes speaking speed, pronunciation, and expressing ideas. In particular, TE5 raised an issue of student teachers' ability to observe and manage class during the teaching. In summary, except for the "the use of teaching methods", the evaluations show similar concerns across all the lecturers. For the "teaching method" section, there are differences between Pure Mathematics and Mathematics Education lecturers. This can be explained by the expertise of the Math Education lecturers of Mathematics Teaching Methodology. These differences show that it is necessary to separate forms for Pure Mathematics and Education Mathematics lecturers with more specific and detailed criteria

so that each form can have space for the differences, for more thoughtful comments, assessments and suggestions.

Also, we recorded some feedback on the training programs at the university of education. Specifically, after summarizing the assessments from the lecturers, the Department of Mathematics and Informatics also gave recommendations in the report to the university of education: "Lecturers need to focus on providing training in vocational skills and soft skills (communication, behavior) for students in every lesson. The university needs to develop more topics to improve soft skills for students". Besides, although it is explicit in the evaluation form, TE5 has proposed: "There should be a request for students in the group to observe each other practicing and evaluate their peers". This proposal tends to relate to administration, to better manage collaboration activities during the observation time. From here, we believe that it is necessary to add to the form of the lecturer a section of a proposal for training at the university of education. Indeed, the data that we obtained only focused on the reports on the students, not on the issue of reviewing the training program at the Department of Mathematics and Informatics.

❖ ***Conflict of Interest:*** *Authors have no conflict of interest to declare.*

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MÔ HÌNH HỢP TÁC GIỮA GIÁO VIÊN - GIÁO SINH - GIẢNG VIÊN TRONG KÌ THỰC TẬP SƯ PHẠM CỦA ĐẠI HỌC SƯ PHẠM THÀNH PHỐ HỒ CHÍ MINH

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TÓM TẮT

Nhiều trường đại học sư phạm lớn của Việt Nam có lịch sử lâu đời tính từ các đại học tiền thân theo mô hình đại học sư phạm kiểu Pháp (khoảng giữa thế kỉ XX). Trong mô hình này, việc đào tạo giáo viên Toán đặt trọng tâm trên việc trang bị cho sinh viên các kiến thức toán lí thuyết. Khoảng mười năm gần đây, dưới áp lực phải thay đổi của Bộ Giáo dục và Đào tạo, vấn đề đào tạo nghiệp vụ ngày càng được chú ý hơn. Tỉ lệ các học phần liên quan đến Giáo dục và Giáo dục toán học đã tăng thêm mặc dù vẫn nhỏ hơn so với tỉ lệ học phần về toán lí thuyết. Trong bối cảnh này, Trường Đại học Sư phạm Thành phố Hồ Chí Minh đã tổ chức công tác: giảng viên dự giờ giáo sinh trong kì thực tập sư phạm tại trường trung học phổ thông. Để phân tích công tác này, chúng tôi mô hình hóa nó như một sự cộng tác của các bên liên quan và tiến hành phân tích dữ liệu ban đầu thông qua một số báo cáo của giảng viên. Kết quả gợi ý cần cải tiến mức độ tham gia của giảng viên trường sư phạm trong mô hình hợp tác này.

Từ khóa: hợp tác; giáo sinh; thực tập sư phạm; đào tạo giáo viên