Analysis of Prospective Mathematics Teachers’ Basic Teaching Skills (a Study of Mathematics Education Departement Students’ Field Experience Program at STKIP Garut)

D. V. Rahayu
Department of Mathematics Education, Sekolah Tinggi Keguruan dan Ilmu Pendidikan, Jl. Pahlawan Sukagahih No.32 Sukagahih, Garut 44151, Indonesia
Email: Diar_math@yahoo.com

Abstract: This study was intended to figure out basic teaching skills of Mathematics Department Students of STKIP Garut at Field Experience Program in academic year 2014/2015. This study was qualitative research with analysis descriptive technique. Instrument used in this study was observation sheet to measure basic teaching mathematics skills. The result showed that ability of content mastery and explaining skill were in average category. Questioning skill, conducting variations skill and conducting assessment skill were in good category. Managing classroom skill and giving motivation skill were in poor category. Based on the result, it can be concluded that the students’ basic teaching skills weren’t optimal. It is recommended for the collegians to get lesson with appropriate strategy so that they can optimize their basic teaching skills.

Keywords: Basic Teaching Skill, Field Experience Program.

1. Introduction
Education has a very important role in developing a nation. The main factor that decides the quality of education is teachers so that the quality of teachers should be in the main focus to enhance the quality of education in our country. Professional teachers can be created through appropriate courses in every subject since they are prospective teachers. Act no 2 in 2012, about university/college, explicitly describe that courses inuniversity/college,is expected to give change to the students to optimally develop cognitive, affective, and psycmotionic aspect. For the sake of this target, government has published Presidential Regulation no. 8 in 2012 about KerangkaKualifikasiNasional Indonesia (KKNI) which guides the arrangement of the graduated learning target in every educational grade in the country. The learning achievement for graduated bachelors is stated up to level 6.

Concerning that matter, The Indonesian Mathematical Society (IndoMS) has arranged Mathematic Department bachelor degree based on parameter of job field skill, cognitive job field skill, and managerial skill. Lesson achievement based on job field skills are: 1. to be able to plan, to implement, to evaluate innovatively through applying mathematicsdicstatepedagogics concepts and mathematic knowledge and also to make use various learning sources, science and technology which are life skill oriented. 2. To be able to interpret and apply various available mathematics learning methods which are innovative and tested. 3. To be able to do fostering to students in Mathematics learning process. 4. To be able to arrange
and perform research to produce alternative ways to solve problem in Mathematics learning and publish them [1][2].

Based on lesson achievement qualification of KKNI and IndoMS above, Students of Department of Mathematics Education must have good basic teaching skill in teaching Mathematics. So that, students of university/ college shouldn’t only have mathematic skill but also have classroom management skill. The course that makes it possible for students to apply that skills is Students’ Field Experience Program (Program Pengalaman Lapangan/PPL). PPL is a course that must be taken by 7th semester students in Department of Mathematics Education of STKIP Garut.

The importance of basic teaching skills is as stated in Act no. 14 in 2005 about teachers and lecturers, such thing like pedagogics competence and professionalism competence. Sanjaya [3] stated that teachers’ basic teaching skills are needed in order to make teachers be able to do their role in managing learning process so that learning process can run smoothly and efficiently. Furthermore, basic teaching skills are an absolute requirement for teacher to be able to implement various lesson strategies.

According to the explanation, the writer’s interested in investigating basic teaching skills of Mathematics prospective teachers that joined PPL. In order to perform it, the writer did research entitled Analysis of Prospective Mathematic Teachers’ Basic Teaching Skills (a study of Mathematics Education Department Students’ Field Experience Program at STKIP Garut).

2. Study Literature

Basic Teaching Skills is defined as measured and coherent activity performed by teachers in order to make students study [4]. Wragg [4] stated that basic teaching skill as “strategies that teachers use which facilitate pupils’ learning and which are acknowledged by those competent to judge as being skills”.

Basic teaching skill is involved with some fundamental skills that must be acquired and actualized by every teacher, lecturer, and instructor in doing their duty. As for teacher, in regulation of Minister for the Empowerment of State Apparaturus no.16 in 2009, it’s stated that teachers should plan and perform quality learning process, evaluate learning result, and provide enrichment and remedial [5]. Teachers are in charge in choosing and deciding materials, strategies, methods, media, and instruments for evaluation in performing learning process to achieve education result which has high quality and has been accepted by teachers’ ethic code.

Regarding those issues above, every teacher should have got good basic teaching skills. Basic teaching skills consist of questioning skill, motivational skill, conducting variation skill, explaining skill, opening and closing learning skill, guiding small discussion group skill, classroom management skill, teaching individual skill [6].

Basic teaching skills in teaching mathematics involved with special mathematics’ skills and they should be implemented by every teacher [7]. One of those characteristics is for example the existence of abstract concepts which require special explanation and appropriate samples so that explaining skills is one of basic teaching skills to be mastered by mathematics teachers [8]. In addition, questioning skill needs to be mastered by Mathematics teachers in order to be able to develop students’ thinking level [9].

Shellard and Moyer [10] stated characteristic of effective mathematics teaching, for example teachers should make students “explain” and ask “why” in questions to students answers. Ball [11] told that in teaching mathematics teachers must be able to:

- Design systematic and accurate explanations so that students can use them
- Use systematic approaches and complete definitions
- Present ideas carefully, map things and graphic models, note symbols, operations or processes
- Interpret and make pedagogicassessments
- Respond students’ inquiries and mathematics questions
• Make assessments of mathematics lesson material quality
• Question good mathematics questions and problems and then modify according to necessities
• Assess students' mathematic learning progress and give it to next step

According to definitions and some opinions above, the writer states that teaching mathematics need basic teaching skills which can accommodate mathematics characteristics. It is meant for teachers to pack the learning process to be good and interesting for students so that it can persuade them to study. Those skills are called basic teaching mathematic skills, such as:

• Ability to master mathematics contents
• Ability to explain concepts, definitions, formulas, and mathematics symbols
• Ability to question in order to explore mathematics ideas, to respond students' inquiries and questions
• Ability to perform variation of using various mathematic learning approaches or strategies which are effective depend on situations and conditions
• Ability to give motivation through mathematic connections
• Ability to manage classroom and facilitate both individual and group discussions
• Ability to perform assessments

3. Research Method
This Research is a qualitative research with analysis-descriptive technique. The subjects of the research were 4 students of Mathematic Education Department at STKIP Garut which took PPL SMAN 16 Garut in 2015. Instruments used in this research is observation sheet of basic skills of teaching mathematics arranged by some writers with guided by Instrument Penilaian Kinerja Guru (IPKG) and some related journals. The data analysis technique used in this research were data reduction, data presentation, and conclusion drawing. As for deciding basic teaching skills mastery, it's based on the criteria stated by Furqan [12] in the table 1 below:

| Average Class Score | Category       |
|---------------------|----------------|
| 80% < x ≤ 100%      | Very Good      |
| 67% < x ≤ 80%       | Good           |
| 53% < x ≤ 67%       | Average        |
| 40% < x ≤ 53%       | Poor           |
| x < 40%             | Very Poor      |

4. Research Results and Discussion
Basic teaching skills which were observed and analysed in this research were 1. Ability to master mathematics contents, 2. Explaining skill 3. Questioning skill 4. Motivational skill 5. Skill of performing variation 6. Skill of managing classroom 7. Skill of conducting assessments. Analysis result for the seven basic teaching skill components can be seen in table 2 below:
Table 2. Assessments of every Component in Basic Teaching Mathematics Skills

| Basic Teaching Skill Components            | Skor Total | Skor Mak | Nilai | Criteria |
|-------------------------------------------|------------|----------|-------|----------|
| (1) Ability to master Mathematics contents| 29         | 48       | 60,4% | Average  |
| (2) Explaining skill                      | 20         | 32       | 62,5% | Average  |
| (3) Questioning skill                     | 61         | 80       | 76,25%| Good     |
| (4) Giving motivational skill             | 31         | 64       | 48,4% | Poor     |
| (5) Conducting variations kill            | 35         | 48       | 72,9% | Good     |
| (6) Managing class skill                  | 74         | 144      | 51,4% | Poor     |
| (7) Conducting assessment skill           | 24         | 32       | 75%   | Good     |
| Total                                     | 272        | 448      |       |          |

Mostly, it can be concluded that Students of Mathematic Education Department who took PPL in SMAN 16 Garut had average basic teaching skill 60.71%. As for achievement and categories for each basic teaching skill components are:

4.1 Ability to master mathematics content
Assessments percentage of ability to master mathematics content had major role in affecting others achievement of skill components like explaining skills.

4.2 Explaining Skill
Explaining skill category described those students who were mathematics prospective teachers’ skill was on average category with percentage assessments 62.5%. The skill has deep connection with the level of mathematics content mastery, the higher his mathematical content mastery, the better his explaining skill. It’s showed by the average category of mathematical content mastery of trainee students.

4.3 Questioning Skill
Percentage assessments of collegians reached 78.25%. It’s considered good. If it’s generally inspected, the component of questioning skill was in good category. But if we check it through every indicator, one of five indicators was not fulfilled. It was to lead students to problem solving. It’s caused by the lack of collegians’ understanding about problem solving.

4.4 Giving motivation skill
Giving motivational skill of mathematics prospective teachers was in poor category with 48.4% assessments. The poor score was affected by many factors. One of them was the lack of experience gained by the collegians in responding students’ conditions. The case was obviously showed in the indicator of using material to make students think critically. In the practice, the collegians only focused on the delivering of material without directing students into thinking critically.

4.5 Skill of conducting variations
Skill of conducting variations of the mathematics prospective teachers was in good category with assessment percentage 72.9%. Based on analysis result of every indicator, they had conducted variations well especially in using various tools/media/learning sources effectively. In the practice, they had used learning media effectively. It is appropriate to learning objectives which were told in the beginning of learning process.

4.6 Managing class skill/skill of classroom management
The managing class skill of mathematics teacher is in poor category percentage achievement 51.4%. Managing class skill in this research includes opening and closing lesson skill, guiding group discussion skill, and teaching small groups and individual skill with nine indicators. The lack skill of collegians in managing class was caused by the little experience they got and also for students; authority aspect of university students seems to be less than guide teachers.

4.7 Conducting assessment skill
Conducting assessment skill of collegians, mathematics prospective teachers, is in good category percentage achievement 75%. Assessment is a very important thing in measuring learning process result. Generally, the trainee students had performed the assessment well and it could measure the achievement level of learning objectives.

5. Conclusion and Suggestion
Mostly, Basic teaching skills of Mathematics Education Department’s students in PPL were in average categories with achievement percentage 60.71%. Based on the result, it can be concluded that the basic teaching skills of prospective teachers has not been optimal yet. They need development. Responding to this case, the writer recommends that they need to get lesson with appropriate strategies so that they can optimize their basic teaching skills.

6. References
[1] Tim Penyusun KKNI Dikti2013Kerangka Kualifikasi Nasional Indoneesiadan Implikasinya pada Dunia Kerja dan Pendidikan Tinggi(Jakarta: Direktorat Jenderal Pendidikan Tinggi)
[2] Tim Kurikulum Prodi S1IndoMS 2013 RekomendasiCapaianPembelajaranansertaStrukturKurikulum Minimal Prodi S1 Matematika, StatistikadanIlmuKomputerTeknikInformatika(Bandung: The Indonesian Mathematical Society-IndoMS)
[3] Sanjaya W 2009StrategiPembelajaranBerorientasiStandar Proses Pendidikan(Jakarta: Kencana)
[4] Kyriacou C 2007Essential Teaching Skills (Third Edition) (Cheltenham: Nelson Thomes Ltd)
[5] PeraturanMenteri Negara PendayagunaanAparatur Negara danReformasiBirokrasi No 16 Tahun 2009 TentangJabatanFungsional Guru danAngkaKreditnya.
[6] Usman M U 2002Menjadi Guru Profesional(Bandung: RemajaRosdakarya)
[7] Nasution M2014JurnalKajianKeislamanStudiMultidisipliner11-15.
[8] Frasetyana, et al 2015JurnalElektronikPembelajaranMatematika3383-94.
[9] MauigoaL and Tekene2006Journal of Teachers’ Work3 12-23
[10] Shellard E and Moyer P S 2002What Principals Need to Know about Teaching Math(Alexandria, VA: The National Association of Elementary School Principals)
[11] Ball DL 2003What Mathematical Knowledge is Needed for Teaching Mathematics (Michigan: Secretary’s Summit on Mathematics)
[12] Mulyatun2014Jurnal Pendidikan MIPA Phenomenon4 79-90