The Analysis of Learning Obstacle and Students Learning Motivation of Prospective Math Teachers in Basic Physics Class

D T Kurniawan¹, A Suhandi², I Kaniawati² and D Rusdiana²

¹Graduate School of Universitas Pendidikan Indonesia
²Departemen Pendidikan Fisika, Universitas Pendidikan Indonesia
Jl. Dr. Setiabudhi No. 229, Bandung 40154 Indonesia

*Corresponding author’s email : dedetrikurniawan@fkip-unswagati.ac.id

Abstract. Learning motivation revealed as a whole intrinsic factor that created, maintained and supported students to achieve the goal of learning. As the bigger motivation came with bigger success, motivation was considered as the main key to reach what students have planned. There were intrinsic and extrinsic factors that influence both the students and lecturers’ motivation. The factors in one hand, were essential to be defined by the lecturers in order to maintain and enhance the students’ enthusiasm. On the other hand, they also encouraged and thrilled the students to learn. The study aimed to expose and describe the motivational tendency and to knowledge and analyze learning obstacles faced by the students in basic physics class on students of prospective math teachers in FKIP Unswagati Cirebon. In addition, the study focused on the description of the six motivational components stated by Glyn and Koballa. The six were intrinsic motivation, extrinsic motivation, the relevance of studying physics for subjective purposes, willpower, self assessment and anxiety. Class responses were determined through questionnaire with four main indicators; the causes of being less popular subject, the cause of being disfavored subject, the description of the way the students draw the examination on basic physics subject and the academic background of the students. The results showed that 54% students stated that physics was disfavored because the subject was difficult to understand, 49% stated that the cause of being disfavored of the subject was because physics required complicated mathematics. Most of the students preferred to have game based activities that boosted thinking skill. According to the analysis of the students’ motivation, the findings revealed that the students’ had high level of anxiety in learning the subject. They mostly expressed their anxiety appeared from the material density and text book based assignments.

1. Introduction
Low mastery of the material and the ability of prospective teachers certainly related to the difficulties and problems faced by students. Mathematical competence of students will grow more optimal if the teachers are competent in managing the learning process, both from learning material as well as boost the activities students in learning mathematics. The teacher’s competence can not be separated from his ability when he obtained the learning of mathematics in college (as student teachers).

The lecture in the classroom is one of the activities in learning activities. There are several factors that determine the teaching and learning activities that faculty, students, curriculum, learning
environment, Media, and psychological factors. The psychological factor is a factor of the which is the main thing that determines the intensity of study that includes: interest, intelligence, aptitude, motivation and cognitive ability (Djamarah, 2002). Interests are subject steady tendency to feel attracted to study or subject-specific and were delighted to learn the material (Winkel, 2004). Each learning activity will be found lazy students who participated and actively participates to follow the lessons. Interest has a great influence on learning activities. The learning process will run smoothly when accompanied by an interest because the interest is the tool main motivation that can encourage student learning within a certain timeframe. Motivation to learn is overall the driving force of psychic within the students who lead learning activities, ensure the continuity of learning activities, and provide direction on learning activities to achieve objectives (Winkel, 2004). Motivation can determine whether or not achieve the goal, so the greater the motivation will be even greater success achieved. Student motivation in following the practice learning can arise intrinsically and extrinsically (Winkel, 2004). A set curriculum in mathematics education courses FKIP Unswagati Cirebon become one of extrinsic motivation for students in the following study because it follows these activities is compulsory for students in order to apply the theories and concepts acquired during the learning in the classroom. So like it or not the student should follow. Intrinsic motivation is more important than extrinsic motivation for intrinsic motivation comes from within the individual itself without any external stimuli intrinsic motivation is more genuine and lasting, and does not rely on impulse or the influence of others.

Motivation plays an important role in the learning process for both lecturers and students. For professors find the motivation to learn from the students was very necessary to maintain and enhance the students' learning spirit. For students learning motivation can foster the spirit of learning so that students are motivated to do the act of learning. student learning activities with pleasure because it is driven motivation.

Based on the exposure of the background mentioned before, it is necessary to do a research on the analysis of learning difficulties and learning motivation student teachers of mathematics in general physics coursework.

2. Research Methodology

2.1. Participants
The Research was conducted on mathematics education courses FKIP Unswagati Cirebon. This study was conducted to find the motivation to learn and difficulty learning mathematics student teachers in the following general physics lectures. Student teachers of mathematics in question are the first semester students who signed the general physics course in mathematics education courses in FKIP Unswagati Cirebon in the first semester of 2014 to 2015 and the first semester of 2015-2016.

2.2. Instrument

2.2.1. Observation. Conducting observations directly to the college mathematics education courses FKIP Unswagati Cirebon. Observations made during the learning takes place on the campus. These observations were made to dig up information all about the difficulties and motivation to learn mathematics student teachers in the following general physics lectures.

2.2.2. Questionnaire. Questionnaires were distributed to the students was a questionnaire to solicit a response / feedback regarding the difficulties and motivation to learn mathematics student teachers in the following general physics lectures. Motivation Questionnaire This study focused on six components description Disclosure motivation to learn. Six component motivation to learn by Glyn and Koballa is intrinsic motivation, extrinsic motivation, the relevance of studying physics for personal purpose, determination, self-assessment ability to general physics lecture and the last is Anxiety.
2.2.3. Interview. Interviews were conducted with faculty that aims to find teaching methods that are used, the barriers faced by lecturers in providing general physics lectures. In addition, interviews were conducted with some student teachers of mathematics to know the difficulties and motivation to learn other less revealed through questionnaires.

2.2.4. Analysis of document. After seeing the results of questionnaires student teachers of mathematics and interviews with parties related to the research, to more convincing results of the report, the documents related to the study analyzed. These documents include the value obtained by the student in a particular subject, such as the Irish Lectuer GBPP and SAP as well as an evaluation tool used by lecturers like Quis, UTS and UAS. In general, these research activities can be seen in this figure:

![Diagram of research steps]

Figure 1. Research Step

3. Result And Analysis
Data research consisted of motivation and difficulty student teachers of mathematics in elementary physics coursework. The data is then in the recap, analyzed and presented then used to answer research questions. Data for motivation to learn decomposes in the form of a diagram in figure 2 Until figure 8. For learning obstacle data presented in figure 9 up to figure 12.
Figure 2. Motivation prospective student learning math teacher in the lecture physics

Students Motivation In Physics Class

| Category                              | Percent |
|---------------------------------------|---------|
| Internal Motivation                   | 78.6    |
| Eksternal Motivation                  | 76.8    |
| Relevance studied physics with persona goals | 86.2 |
| willpower                             | 74.4    |
| Self-efficacy ratings                 | 80.8    |
| Worry                                 | 72.7    |

Internal Motivation

| Enjoy Learning Physics                | 96.15   |
| Very excited to Prepare Physics Exam  | 50.00   |
| Find interesting material in physics  | 88.57   |
| Like Physics because give a Challenge| 63.64   |
| Understand the physics makes me excel | 85.00   |

External Motivation

| do better than other students in physics tests | 44.44 |
| studied physics very valuable for me         | 89.74 |
| physics helped me get a better job           | 75.68 |
| Value physics affect my life                  | 84.85 |
| studied physics helped my career             | 68.75 |
| physics I learned more important than the value | 94.44 |

Figure 3. Internal motivation students prospective mathematics teachers in the course physics

Figure 4. External motivation students prospective mathematics teachers in the course physics
**Figure 5.** Relevance Learning Objectives owned by Students Prospective mathematics teachers in the course Physics

**Figure 6.** Prospective students determination mathematics teacher in the lecture physics

**Figure 7.** The ability to self-assessment Students Prospective mathematics teachers in the course Physics
3.1. Learning Obstacle Analysis Class Basic Physics Candidate for Math Teachers in Unswagati

3.1.1. Background Education Students Prospective math teachers. Questionnaire results of the student teachers about math education background can be seen in Figure 9 below.

![Figure 9. Profile education background mathematics student teachers in FKIP Unswagati Cirebon](image)

3.1.2. Opinions on for Un-fun basic physics class. Questionnaire results of the student teachers of mathematics into the causes unpleasant subject of basic physics lectures can be seen in Figure 10 below.
3.1.3. **Opinions on because he did not like the basic physics Class**. Questionnaire results of the student teachers disliked math as to the cause of basic physics lectures can be seen in Figure 11 below.

![Figure 11. Opinions on because he did not like the basic physics of student teachers of mathematics in FKIP Unswagati Cirebon](image)

3.1.4. **Assessment Lecturer of Physics Students on the basis of the results of Questionnaire**. Rating student teachers of mathematics to physics lecturer base can be seen in Figure 12 below.

![Figure 12. Assessment of student teachers of mathematics to the basic physics lecturer at FKIP Unswagati Cirebon](image)
4. Discussion
From the analysis of the motivation to study physics for student teachers of mathematics known to turn out students have high levels of anxiety following the lecture in physics. Most students expressed concern that high is because the material is quite dense and system administration tasks to students were pretty much out of textbooks.

Data answer the questionnaire results showed that student teachers of mathematics do not like basic physics lectures because the subject is less understandable (54%). In addition to the basic physics requires mathematical considered difficult (49%) are increasingly making basic physics is not liked by the students. From Questionnaire was known that the educational background mathematics student teachers are dominated by the IPA (69%), social studies (16%), the rest are from SMK.

It is considered to be pleasant from basic physics lecture is a lecture is very applicable for exposing the problem and the phenomenon of natural events that day - the day we can find (39%). Physics lectures an important basis for the provision of prospective teachers of mathematics, and they shall be aware of it. how the processes, products and attitude are supplied to them through this course will be an advanced provisions that are very useful for their future. Osborne and Freyberg (1985: 91) reveals that one of the roles that science teachers as a motivator (motivator). A teacher should provide motivation and instill the perception to students that learning is something that is needed to achieve success in the future not compulsion. Therefore, the learning activities in the classroom must be made so that students are motivated to learn, for example by the method of teaching a fun, exciting games, because it is known that students generally like a game that uses the process of thinking (66.7%). Performance Assessment of lecturers by students appears that the value of the lowest faculty currently on the teaching materials used (58.4%).

5. Conclusion
From the results of research can be concluded that prospective students do not like the math teacher lecture the fundamental physics because the subject is less understandable (54%). In addition to the basic physics requires mathematical considered difficult (49%) are increasingly making basic physics is not liked by the students. From Questionnaire was known that the educational background mathematics student teachers are dominated by the IPA (69%), social studies (16%), the rest are from SMK. Besides It students have high levels of anxiety following the lecture in physics. Most students expressed concern that high is because the material is quite dense and system administration tasks to students were pretty much out of textbooks.

6. References
[1] Abin S M 1998 Psikologi Kependidikan (Bandung : PT. Remaja Rosda Karya)
[2] Thomas A 1996 Multiple Intelligences in The Classroom (Virginia: Association for Supervision and Curriculum Development)
[3] Ali I 2010 *Potrait prestasi Belajar fisika SMA pada jurusan teknik gambar bangunan, teknik komputer jaringan, teknik otomotif dan teknik pemanfaatan energi di SMKN X Garut*. (Bandung: Sekolah Pascasarjana UPI)

[4] Dede T K 2013 *Jurnal LOGIKA Unswagati Cirebon* 1(2) pp 93-104

[5] Dede T K 2015 *Analisis Gaya Belajar (Learning Styles) dan Profil Kecerdasan Majemuk (Multiple Intelligence) Mahasiswa Calon Guru Matematika FKIP Unswagati Cirebon*. Penelitian LEMLIT Unswagati

[6] Dede T K 2015 *Upaya Meningkatkan Penguasaan Konsep Dan Keterampilan Proses Sains Mahasiswa Calon Guru Matematika Fkip Unswagati Cirebon Pada Konsep Fluida Statis* Penelitian Lemlit Unswagati 2014

[7] Lazear D 2004 *High order Thunking the multiple intelligence way* (Chicago, USA: Zephyr Press)

[8] Makmum A S 2003 *Psikologi Pendidikan* (Bandung: Rosdakarya)

[9] Ratna W D 1991 *Teori-teori Belajar* (Jakarta: Erlangga)

[10] Sardiman 2005 *Interaksi dan Motivasi Siswa* (Jakarta: Raja Grafindo Persada)

[11] Robert E S 2009 *Educational Psychology : Active Learning Edition 12th Edition* (Ohio: Pearson International)

[12] Sumadi S 2004 *Psikologi Pendidikan* (Jakarta: Rajawali Pers)