IOSR Journal of Mathematics (IOSR-JM)
e-ISSN: 2278-5728, p-ISSN: 2319-765X. Volume 12, Issue 3 Ver. I (May. - Jun. 2016), PP 01-07
www.iosrjournals.org

The Effect of Numerical Intelligence and Student Interest to the Mathematics Learning Achievement of Student (Survey in SMAN [Public Senior High School], East Jakarta)

Erlis Warti
Study Program of Mathematics and Natural Science Education Postgraduate Program University of Indraprasta Pgri

Abstract: *This research aims to know whether yes or no direct effect of numerical intelligence to the student learning achievement, direct effect of student interest to the mathematics learning achievement of student, direct effect of numerical intelligence to the learning interest, indirect effect of numerical intelligence to the student learning achievement through learning interest. Research method that used was survey method. The sample size was 100 students which taken in random and hierarchy based on ratio of student number in every SMA Negeri (Public Senior High School) in East Jakarta. Data analysis included descriptive analysis, Pearson's simple correlation coefficient, and path coefficient. Statistical test that used was F test with the assistance of SPSS 16.*
Keywords: *Numerical Intelligence, Learning Interest, Mathematics Learning Achievement*

I. Introduction

Mathematics as one of basic science, recently has been developed rapidly both material and its use. Mathematics which comes from Latin of *manthanain* or *mathema* which means learning or things that taught. Meanwhile, in Dutch is *wiskunde* which means exact science that all related to the reasoning activity.

Mathematics learning achievement is student attainment level after the learning activity. In the learning activity, students will get assessment including cognitive, affective, and psychomotor domain. Learning achievement test is ability assessment that conducted to the students which including those three domains in the report score of semester or score certificate after they finish the study. In the learning activity, the school established learning competence standard for the effect of student's numerical intelligence to the mathematics learning achievement of student through mathematics learning motivation with the score of six point zero. If the students in the achievement test get score bigger than six point zero, then the students stated as passing in the learning and get achievement. The writer would take achievement size from test of unit one, two, and three in the 10^{th} Grade at the end of second semester.

Students in the 10^{th} Grade of Senior High School commonly are 14-17 years old. In this age, achievement becomes very important for teenagers in self actualization and in this time the teenagers start to realize that they are demanded to be independent in facing the real life. In the teenage period, students are still immature as personal, they still need people around (their environment) either family, peers, or others to be made as role model or behavioral guidance and the student success at that time will be basis for student success in the future.

Student learning achievement can be affected such as by their learning interest to the subject. If the students have less learning interest, then the students will have difficulty in mathematics learning which results in less interest to learn about mathematics and will have bad impact to their learning achievement.

From the observation of mathematics teachers in SMA Negeri (Public Senior High School) East Jakarta area, many students paid less attention to the teacher explanation in front of the class. It could be caused by their less interest to the mathematics learning. The hypothesis might be the low mathematics learning achievement was caused by less student learning interest. And then it could be studied about factors that affect the low and high learning interest that owned by students in learning mathematics. Motive in the learning interest itself could be observed through assessment to the basic desire and potential idea which works as the dynamic driving force in every life activities (Lestar D. Crow and Alice Crow, 2005: 325-326).

By knowing the importance of student learning achievement, the school was expected to be able to cope with psychological obstacle which suffered by learners, because in the teenage period, they need psychological guidance and career guidance. Therefore, the researcher wanted to know psychological factors of students in student's numerical intelligence to the mathematics learning achievement of student through mathematics learning interest. The researcher had assumption that in SMA Negeri East Jakarta area, there was the effect of numerical intelligence and learning interest to the learning achievement, the effect of student's numerical intelligence to the mathematics learning achievement of student through mathematics learning interest. Thus, the writer conducted a research about: The effect of numerical intelligence and learning interest

to the mathematics learning achievement

II. Study Literature

1. Theory of Mathematics Learning Achievement

a. Learning

Learning is processed activity and very fundamental element in the education type and level. The success or not education attainment depends on learning process of learners in the school and society environment. According Uno (2010: 194), learning commonly means as process of someone's behavior change after learning certain object (knowledge, attitude, or skill). Learning is highlighted by the change in the personality which self stated as new pattern of reaction, which is skill, attitude, habit, cleverness, or a definition (Witherington, 1996: 64).

b. Learning Achievement

Learning achievement is final product from a learning process. Ability to apply knowledge and learning concept is basic in improving student learning achievement. By remembering the existence, learning achievement is not stand alone but it attached to many other factors.

Effendi (2007: 29) stated that worries and anxiety over small things mostly can disturb learner which make them feel difficult to be well concentrated, thus it will affect their learning achievement.

III. Research Method

Method that used in this research was survey method, critical observation or inquiry to gain well explanation to a problem and in the certain area (Margono, 2007: 29). The obtained data then processed, interpreted, and concluded.

Approach that used was quantitative, which is approach that enable to be conducted by recording and data analysis of research result exactly and analyzing the data using statistical computation (Sugiyono, 2007: 7).

Variable that studied was three variables, numerical intelligence (X_1) and learning interest (X_2), and learning interest (X_3). This method was selected as with the research aim and the researcher wanted to know how was the effect between learning interest variable to the learning achievement, how was the effect between numerical intelligence variable to the learning achievement, how was the effect between learning interest and numerical intelligence variable to the learning achievement simultaneously, and how was the contribution of learning interest and numerical intelligence variable to the learning achievement.

A. Population, Sample, and Sampling Technique

1. Population

1. Population was generalization area which consisted of: object/subject that owned quality and characteristic which been established by researcher and then drawn the conclusion (Sugiyono, 2008:117)
2. Population in this research included three SMAN (Public Senior High School) in East Jakarta area for 1000 students

2. Sample

Sample is part of number and characteristic that owned by research population. The way to take sample that conducted by researcher was using simple random sampling in which every population member obtained equal opportunity to be made as sample in the research.

3. Sampling Technique

Sampling technique is sample taking in which every population member obtained equal opportunity to be made as sample member. The researcher in this research used Proportional Cluster Random Sampling technique, where sample number from each school taken proportionally based on ratio of student number in each school to the number of whole population.

IV. Research Result And Discussion

In the description of this research data, it would be expressed many research results from the obtained data: the highest score, the lowest score, mean, mode, median, variant, and standard deviation. In the obtained data processing, the researcher conducted data processing with the assistance of Microsoft Office Excel 2007 and SPSS 16 and the result as follow:

1. Numerical Intelligence

Based on computation with the assistance of SPSS 16, it was obtained data processing result as follow:

1) Mean: 87.48

2) Mode: 64.00

3) Median: 84.00
4) Standard Deviation: 26.58
5) Variant: 706.596
6) Highest score: 142.00
7) Lowest score: 40.00

And then the figure of histogram from Numerical Intelligence score as follow:

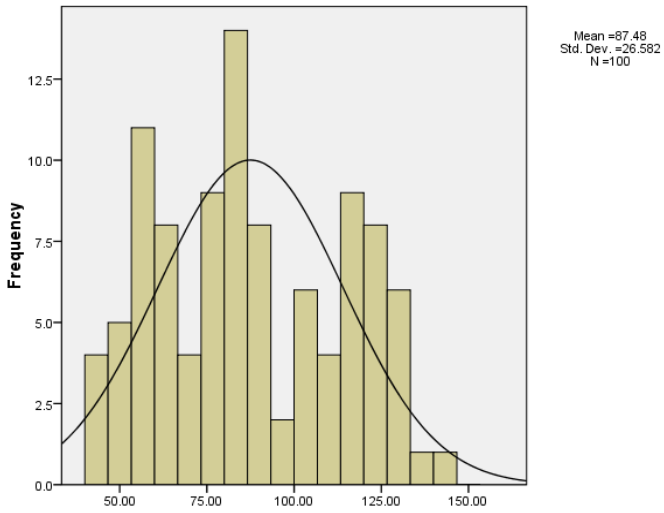

Figure1. Histogram of Numerical Intelligence

The histogram above is description with bar type which shows frequency from each data. Polygon shows type which approaching normal curve. It showed that the obtained data in this research was normal distributed because the curve approaching normal curve type.

2. Learning Interest

Based on computation with the assistance of SPSS 16, it was obtained data processing result as follow:
1) Mean: 136.19
2) Mode: 136.00
3) Median: 136.50
4) Standard Deviation: 38.04
5) Variant: 1446.863
6) Highest score: 210.00
7) Lowest score: 59.00

And then the figure of histogram from Learning Motivation score as follow:

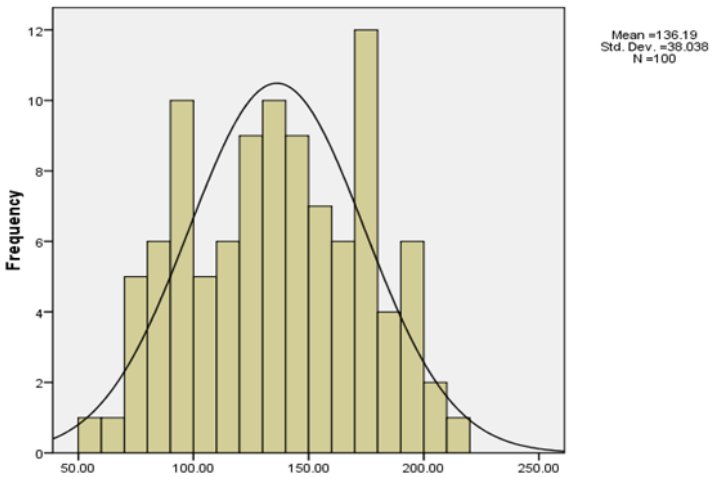

Figure 2. Histogram of Learning Motivation

The histogram above is description with bar type which shows frequency from each data. Polygon shows type which approaching normal curve. It showed that the obtained data in this research was normal distributed because the curve approaching normal curve type.

3. Mathematics Learning Achievement of Student

Based on computation with the assistance of SPSS 16, it was obtained data processing result as follow:

1) Mean: 21.10
2) Mode: 34.00
3) Median: 20.00
4) Standard Deviation: 9.56
5) Variant: 91.42
6) Highest score: 35.00
7) Lowest score: 4.00.

And then the figure of histogram from Mathematics Learning Achievement score as follow:

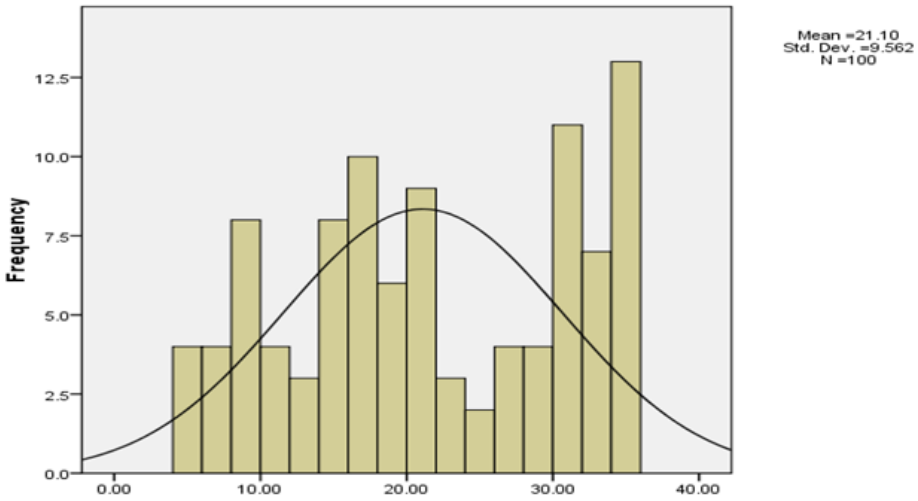

Figure 3. Histogram of Mathematics Learning Achievement

The histogram above is description with bar type which shows frequency from each data. Polygon shows type which approaching normal curve. It showed that the obtained data in this research was normal distributed because the curve approaching normal curve type.

Interpretation of Research Result

1. Direct Effect of Numerical Intelligence to the Student Learning Achievement

Research finding showed that numerical intelligence which assessed by mathematics learning achievement of student showed significant correlation and had strong direct effect (bigger than **0.05**) to the mathematics learning achievement of student.

The direct effect of numerical intelligence to the mathematic learning achievement was **KD = P_{13}^2 x 100% = -0.372 x -0.372 x 100% = 13.8 %**, the remaining was **86.2%** was affected by other factors out of numerical intelligence.

Therefore, to improve and optimize student learning achievement could be conducted such as by improving numerical intelligence. To improve numerical intelligence needs to be supported by student ability in thinking logically.

Research result proved about the effect between numerical intelligence to the learning achievement.The other psychological factor which affected learning achievement was intelligence. Intelligence played much role, especially to the high and low achievement that achieved by student. The description about child with high intelligence is smart student, student who always success in his/her grade with good score. Indeed, usually students with high intelligence are easier to understand the learning in school than students with low intelligence (Mulyana, 2006: 190). Based on the research finding it could be stated that mathematics learning achievement of student could be affected by numerical intelligence.

2. Direct Effect of Learning Interest to the Mathematics Learning Achievement of Student

Research finding showed that there was significant correlation of learning motivation with mathematics learning achievement of student. It was showed by correlation coefficient number **0.155 and sig 0.000 < 0.05** in

the correlation analysis. There was direct and significant effect of student motivation to the mathematics learning achievement of student. It was showed by the result of path coefficient number for **0.520 (bigger than 0.05).** The direct effect of motivation to the mathematics learning achievement was **KD = P_{23}^2 x 100% = 0.520 x 0.520 x 100% = 0.270 = 27%**, the remaining **73%** was affected by other factors out of learning motivation.

Brigeman and Shipman (1978) in their research concluded that there was positive correlation between learning interest and learning achievement. And also the research that conducted by Clark (1983) stated that motivation was not affected directly to the learning achievement but affected directly with effort that been devoted to achieve learning achievement.

Based on research finding above, it could be stated that mathematics learning achievement of student could be affected by learning interest. Learning motivation could be expressed through statement which showed that student prefer to a thing than the other, also could be manifested through participation in activity.

3. Direct Effect of Numerical Intelligence to the Learning Motivation

Research finding showed that there was significant correlation between numerical intelligence with learning interest. It was showed by correlation coefficient number for **0.975 and sig. 0.05** in the correlation analysis.

There was direct and significant effect of numerical intelligence to the learning motivation. It was showed by path coefficient number for **0.975 (bigger than 0.05).** The effect of numerical intelligence to the learning motivation was **KD = P_{12}^2 x 100% = 0.975 x 0.975 x 100% = 95.1%.** Meanwhile, the remaining **4.9%** was affected by other factors.

Mulyani (2006) stated that simultaneously there was also positive significant relationship between numerical intelligence with learning motivation. By the right strategy, students will be encouraged and have spirit in learning, thus learning motivation will increase in line with numerical intelligence.

Based on the research finding above, then to improve learning motivation could be conducted by improving numerical intelligence.

4. Indirect Effect of Numerical Intelligence to the Mathematics Learning Achievement of Student Through Learning Interest

Research finding showed that there was indirect and significant effect of numerical intelligence to the mathematics learning achievement of student through learning motivation. The effect was **P_{12} x P_{23} x 100% = 0.975 x 0.520 x 100% = 50.7%.** Meanwhile the remaining **49.3%** was affected by other factors.

Based on this finding, it showed that the improvement of learning achievement could be conducted through learning motivation improvement. By comparing with other findings in this research, it showed that the improvement of mathematics learning achievement of student by numerical intelligence through the improvement of leaning interest was higher than directly from numerical intelligence.

According to Lisnawaty (1993:226), a child who achieves an achievement actually is the success of intelligence and interest. Juhariah (2009) in her thesis stated that big interest will encourage student's motivation itself. Thus, a child is impossible to be success in any activities without any interest. From the result of data collection through questionnaire which given to students, it was known that student's motivation to the mathematics learning was good. Meanwhile, numerical intelligence of student was included into medium category; it was seen from the result of test distribution. Good motivation and medium or good enough numerical intelligence will result in good learning achievement.

It showed that it could be predicted in which it will be more effective in improving mathematics learning achievement if it is conducted by generating learning motivation first in that subject. Thus, students will be interested and love without any compulsion to the mathematics learning. By the growth of learning interest then students will devote their attention as a whole.

V. Conclusion

Numerical intelligence had direct and significant effect to the mathematics leaning achievement of student. Therefore, the high and low mathematics learning achievement of student could be explained by numerical intelligence. The effect of numerical intelligence to the student learning achievement was **13.8%.** Based on this research finding, it means that "**Numerical intelligence was affected directly and significant to the mathematics learning achievement of student**" could be accepted.

Learning interest had direct and significant effect to the mathematics leaning achievement of student. Therefore, the high and low mathematics learning achievement of student could be explained by student learning motivation. The effect of direct learning motivation to the mathematics learning achievement of student was **27%.** Based on this research finding, it means that "**Learning interest was affected directly and significant to the mathematics learning achievement of student**" could be accepted.

Numerical intelligence was affected directly and significant to the learning motivation. Therefore, the high and low learning motivation could be explained by numerical intelligence. The effect of numerical intelligence to the learning motivation was **95.1%.** Based on this research finding, it means that "**Numerical intelligence had direct and significant effect to the student learning interest**" could be accepted.

Numerical intelligence had indirect effect to the mathematics leaning achievement of student through student learning interest. Therefore, the high and low student learning achievement was affected by the increase and decrease learning motivation as impact of the effect by numerical intelligence. The effect of numerical intelligence through learning interest to the mathematics learning achievement of student was **50.7%.** Based on this research finding, it means that "**Numerical intelligence had indirect and significant effect to the student learning achievement through student learning interest**" could be accepted.

Reference

[1]. Anitah, Sri. Janet T. Manoy. Strategi Pembelajaran Matematika. Jakarta : Universitas Terbuka. 2007.
[2]. Armstrong, Thomas. Seven Kinds Of Smart. Jakarta : Gramedia Pustaka Utama. 2002.
[3]. Astuti, N.M. Hubungan antara Minat, Self-Efficacy, Inteligensi dengan Prestasi belajar Bahasa Inggris pada Siswa Kelas X, SMA Negeri 37 Jakarta. Jakarata: Tesis Pascasarjana UPI YAI. 2008.
[4]. Barnadib, Imam. Filsafat Pendidikan. Jakarta : Ghalia Indonesia. 1997.
[5]. Bloom, B., et.al. Taxonomi of Educational Objectives : cognitive domain book New York : Longman. 1956.
[6]. Brigeman, Breat and Shipman, Virginia C. Correlation between motivation and student achievement. Journal of educational psychology. 1978.
[7]. Clark, Barbara. Growing up gifted. Second Edition. Chio:Charless E. Merril Publishing Company. 1983.
[8]. Cronback, L.E. Psykology Educational. New York : Gim and Company. 1958.
[9]. Crow D.L., Crow, A. Psikologi Pendidikan. Penerjemah: Rachman Abror Abd. Yogyakarta: Nur Cahaya. 2005.
[10]. Davis, Robert H. Lawrence T Alexander dan Stephen L Yelon. Learning Sistem Design. New York : Mc Grw-Hill Book Co. 1994.
[11]. Dewanto. Pengukuran dan Evaluasi Pendidikan. Semarang : Semarang Press. 1991.
[12]. Djaali. Psikologi Pendidikan. Jakarta : Bumi Aksara. 2011.
[13]. Djiwandono, Sri Esti W. Psikologi Pendidikan (rev-2), Jakarta : Grasindo. 2007.
[14]. Effendi, Irmansyah. Rei Ki 2. Jakarta : Gramedia. 2007.
[15]. Gagne, Robert M. The Condition Of learning. CBS College Publishing. Newyork. 1985.
[16]. Gardner , Howard. Teori Inteligen Ganda dan Aplikasinya di Sekolah. Jakarta : Kanisius. 2007.
[17]. Hamalik, Oemar. Metode Belajar dan Kesulitan-kesulitan Belajar. Bandung : Tarsito. 1983.
[18]. Hakim, Thursan. Belajar Secara Efektif. Jakarta : Niaga Swadaya. 2007.
[19]. Hidayat, Muhammad. Strategi Pembelajaran. Yogjakarta: Andi Offset. 2004.
[20]. Hudoyo, Herman. Strategi Mengajar Matematika. Malang : IKIP Malang. 1990.
[21]. Juhariah, Asup Suparlan. Tesis : Pengaruh Minat Dan Kecerdasan Numerik Terhadap Prestasi Belajar Matematika Siswa. Cirebon : STAIN. 2009.
[22]. Margono. Metodologi Penelitian. Jakarta : Rhineka cipta. 2007.
[23]. Masrihani, Tuti. Sri Kurnianingsih dkk. Matematika Program Keahlian Akuntansi dan Penjualan SMK X. Jakarta : Erlangga. 2008.
[24]. Muhidin, Sambas Ali. Maman Abdurahman. Analisis Korelasi, Regresi dan Analisis Jalur Dalam Penelitian. Bandung : Pustaka Setia Bandung. 2007.
[25]. Mulyani. Skripsi : Hubungan Antara Tingkat Kecerdasan, Motivasi Belajar, Dan Kebiasaan Matematika Siswa Dengan Prestasi Belajar Matematika Siswa Semester 1 Kelas XI IPA A SMA Negeri 6 Kota Bengkulu. Bengkulu : Universitas Bengkulu. 2006.
[26]. Sinar Harapan. 2011.
[27]. Supardi, US. Aplikasi Statistika Dalam Penelitian. Jakarta : Ufuk Press. 2012.
[28]. _____. Tesis : Pembelajaran Matematika Realistik dan Pengaruhnya terhadap Hasil Belajar Matematika Siswa Ditinjau dari Tingkat Motivasi Belajar. Jakarta : Pascasarjana Uhamka. 2007.
[29]. Winardi.J. Motivasi dan Pemotivasian dalam Manajemen. Jakarta : PT. Raja Grafindo Persada. 2001.
[30]. Winkel, W.S. Psikologi Pendidikan dan Evaluasi Pendidikan. Jakarta : Grafindo. 1996.
[31]. Witherington, W.H Burton, Bapemsi. Teknik Belajar Mengajar. Bandung: Jemmars. 1995.
[32]. Ashar J., Rusdi, Agus Susanta. 1998. "Peningkatan Guru SMP dalam Mengorganisasi Cooperative Learning pada Pembelajaran Matematika di SMP". FKIP Bengkulu
[33]. Arikunto, S (1999). Prosedur Penelitian Suatu Pendekatan Praktek. Edisi Revisi IV. Jakarta : Rineka Cipta.
[34]. Arikunto, S (2001). Dasar-Dasar Evaluasi Pendidikan. Edisi Revisi. Jakarta: Bumi Aksara.
[35]. Bell, F.H.(1987). Teaching and Learning Mathematics (In Secondary Schools). University of Pittsburgh.
[36]. Chiu-Jung Chen & Pei-Lin Liu (2007). Personalized Computer-Assisted Mathematics Problem-Solving Program and Its Impact on Taiwanese Students. Journal of Computers in Mathematics and Science Teaching, 26(2) 105-121.
[37]. Darsono, M. (2000). Belajar dan Pembelajaran. Semarang: IKIP Semarang Press.
[38]. Depdiknas. (2002). Kurikulum 2004 Standar Kompetensi Mata Pelajaran Matematika, Sekolah Menengah Atas dan Madrasah Aliyah Jakarta : Depdiknas
[39]. Dimyati dan Mudjiono. (2002). Belajar dan Pembelajaran. Jakarta : Rineka Cipta.
[40]. Edward W.M, Bruce M.K. (1993). Statistical Reasoning in Psychology and Education. USA: Lehigh Press.
[41]. Elaine B. J. (2007). Contextual Teaching & Learning. Bandung: MLC.
[42]. Frederick, H.B. (1978). Teaching and Learning Mathematics (In Secondary Schools). USA: Brown Company Publishers..
[43]. Irianto Ansari, Bansu. (2003). Menumbuhkembangkan Kemampuan Pemahaman dan Komunikasi Matematika Siswa SMU Melalui Strategi Think-Talk-Write. Disertasi. Bandung: Program Pasca Sarjana UPI.
[44]. Minium, EW & dkk (1993) Statistical Reasoning in Psychology and Education. Third Edition.New York : Jhon Wiley & Sons, INC
[45]. National Council of Teachers of Mathematics (NCTM). (1989). Curriculum and Evaluation Standards for School Mathematics. Reston, VA : NCTM
[46]. National Council of Teachers of Mathematics (NCTM). (2000). Principles and Standards for School Mathematics. Reston, VA : NCTM
[47]. Nurhadi, (2003). Pendekatan Kontekstual (Contextual Teching and Learning). Jakarta: Depdiknas Dirjen Dikdasmen.

[48]. Polya, G.(1985). How to Solve It. A New Aspect of Mathematical Methods. New Jersey: Pearson Education, Inc.
[49]. Ratnaningsih, N. (2003). Mengembangkan Kemampuan Berpikir Matematik Siswa SMU melalui Pembelajaran Berbasis Masalah. Bandung: Tesis PPs UPI. Tidak diterbitkan
[50]. Richard I. Arends (2008). Learning toTeach (Belajar untuk Mengajar).Yogyakarta: Pustaka Pelajar.
[51]. Ruseffendi, E.T.(1991). Pengantar kepada Membantu Guru Mengembangkan Kompetensinya dalam Pengajaran Matematika untuk Meningkatkan CBSA. Bandung: Tarsito.
[52]. Ruseffendi, E.T.(1998). Statistika Dasar untuk Penelitian Pendidikan. Bandung: IKIP Bandung Press.
[53]. Sabandar, J. (2002). Pembelajaran Geometry dengan Menggunakan Cabry Geometri II. Jurnal Matematika atau Pembelajarannya. ISSN : 0852-7792 Tahun VIII, Edisi Khusus, Juli 2002.
[54]. Shamata, H. J. (2004). Technology-Supported Mathematics Activities Situated Within an Effective Learning Environment Theoretical Framework. [Online]. Tersedia: http://www.citejournal.org/vol3/iss4/mathematics/article1.cfm [16 Januari 2009]
[55]. Sudijono, A (2001). Pengantar Evaluasi Pendidikan. PT. Raja Grafindo Persada. Jakarta
[56]. Sugiono (2002). Statistik Untuk Penelitian. CV. Alfabeta. Bandung
[57]. Suherman, E. dan Sukjaya, Y (1990). Petunjuk Praktis Untuk Melaksanakan Evaluasi Pendidikan Matematika. Bandung : Wijaya Kusuma
[58]. Suherman, E. Dkk. (2003). Strategi Pembelajaran Matematika Kontemporer. FPMIPA-JICA UPI Bandung: Tidak Diterbitkan. Sumarmo,U. (2003) . Pengembangan Berpikir Matematik Tingkat Tinggi pada Siswa SLTP dan SMU serta Mahasiswa Strata Satu (S1) melalui berbagai Pendekatan Pembelajaran. Bandung. Laporan Penelitian Pascasarjana UPI-Bandung
[59]. Sumarmo, U.(2002). Alternatif Pembelajaran Matematika dalam Menerapkan Kurikulum Berbasis Kompetensi. Makalah Seminar Nasional FPMIPA UPI. Bandung: Tidak Diterbitkan
[60]. Sumarmo,U. (2003) . Pengembangan Berpikir Matematik Tingkat Tinggi pada Siswa SLTP dan SMU serta Mahasiswa Strata Satu (S1) melalui berbagai Pendekatan Pembelajaran. Bandung. Laporan Penelitian Pascasarjana UPI-Bandung
[61]. Tatang, H. (2009). Evaluasi Pengajaran Matematika. Bandung: PPS UPI.
[62]. Tajudin, et all. (2007). Effect of Use of Graphic Calculators on Performance in Teaching and Learning Mathematics. Journal Education.
[63]. The Liang Gie. (1980). Filasafat Matematika. Yogyakarta: Super.
[64]. Tilaar, H.A.R. (1999) Beberapa Agenda Reformasi Pendidikan Nasional, Dalam Perspektif Abad 21. Magelang : Tera Indonesia
[65]. Tim Matematika SMA (2008). Pembelajaran Matematika SMA. Bandung: UPI Press.
[66]. TIMSS, (2003). International Students Achievement In Mathematics. [Online]. Tersedia: http://timss:bc.edu/timss2003i/pdf/T03imath01.pdf. [27 Desember 2008]
[67]. Trianto, (2007). Model-Model pembelajaran Inovatif Berorientasi Konstruktivistik (Konsep, Landasan Teoritis-Praktis dan implementasinya). Jakarta: Prestasi Pustaka.
[68]. Turmudi. (2008). Landasan Filsafat dan Teori pembelajaran Matematika (berparadigma Eksploratif dan investigative). Bandung: PT. Leuser Cita Pustaka.
[69]. Wahyudin. (1999). Kemampuan Guru Matematika, Calon Guru Matematika, dan Siswa Dalam Mata Pelajaran Matematika. Disestrasi Pada SPS UPU Badung. Tidak diterbitkan.
[70]. (2008). Pembelajaran dan Model-model Pembelajaran: Pelengkap untuk meningkatkan Kompetensi Pedagogis Para Guru dan Calon Guru Profesional. Bandung: diktat Perkuliahan UPI. Tidak diterbitkan.