

# MANAGEMENT INCREASING TEACHER PEDAGOGICAL COMPETENCE IN REALIZING QUALITY MATHEMATICS LEARNING BASED ON HIGHER ORDER THINKING SKILLS (HOTS): CASE STUDY AT SMP IN KOTA BANDUNG

MELINDA PUTRI MUBARIKA <sup>1</sup>, IIM WASLIMAN <sup>2</sup>, HERU SUJIARTO <sup>3</sup> and  
USEP KOSASIH <sup>4</sup>

<sup>1,2,3,4</sup> Universitas Islam Nusantara, Bandung, Indonesia.

Email: <sup>1</sup>melindaputri@uninus.ac.id, <sup>2</sup>iimwasliman@uninus.ac.id, <sup>3</sup>herusujarto@uninus.ac.id,

<sup>4</sup>usepkosasih@uninus.ac.id

## Abstract

Learning mathematics is still perceived by some students as a difficult and unpleasant subject. Therefore, teachers must be able to design a learning process that is fun, flexible, and can motivate students to be actively involved. Therefore, the general aim of this research is to describe and analyze the management of increasing teacher pedagogical competence in realizing the quality of mathematics learning based on Higher Order Thinking Skills (HOTS). Apart from that, this research aims specifically to describe and analyze improving teacher pedagogical competence including: 1) Planning; 2) Organizing; 3) Implementation; 4) Supervision; 5) Obstacles; 6) Solution; 7) Impact. This research uses a qualitative approach with a case study type. Data collection techniques in this research were carried out through interviews, observation and document study. Management theory uses George R. Terry (1992), Piaget's learning theory (Waseo, 2018) and Anderson & Krathwohl's (2001) HOTS theory. The research results show that the management of increasing teacher pedagogical competence in realizing the effectiveness of HOTS-based learning in junior high schools has been oriented towards the principles of teacher pedagogical competence in supporting learning which is in the quite good category. This is because several assessment indicators have been fulfilled from the pedagogical competency aspect. Teachers' pedagogical competence in realizing the effectiveness of HOTS-based learning in the three schools has in principle fulfilled the assessment indicators from the aspect of pedagogical competence, although not fully, including due to time constraints, teacher limitations in technology, and limited facilities. However, the problems in these three schools are not that serious, there are only a few teachers who have a tight time schedule which conflicts with their teaching schedule and only a few teachers who lack the enthusiasm to try new IT-based things.

**Keywords:** Teacher Pedagogic Competence, Management, HOTS Learning.

## INTRODUCTION

Teachers are the most important component in the education system. Teachers are the driving force of the learning process, especially those that occur within the scope of the school, for this reason teachers are required to be able to carry out the learning process professionally. Professional teachers are no longer just teachers who are able to teach well but rather teachers who are able to become learners and agents of school change to improve the quality of learning in their schools. This is in accordance with the mandate of Law Number 14 of 2005 Article 1 which states that "Teachers are professional educators with the main task of educating, teaching, guiding, directing, training, assessing and evaluating students in early childhood

education through formal education, education primary and secondary education". Teacher pedagogical competence is not only how to transfer material to students, but how to improve students' thinking abilities at a higher level, especially with regard to the ability to think critically in receiving various types of information, think creatively in solving a problem using existing knowledge. possessed, argue well and be able to construct explanations, and make decisions in complex situations. These abilities are certainly needed for the younger generation to face the Industry 4.0 era which has uncertain work dynamics. Therefore, learning needs to be designed according to trends in future demands where critical thinking (high order thinking skills) is very necessary in honing various skills including life and career skills, learning and innovation skills and technology and information media skills. These trends in future demands are taken into consideration in determining the 2013 curriculum design, especially the curriculum components in the aspects of objectives, content/materials, and learning processes.

## **THEORETICAL BACKGROUND**

Republic of Indonesia Government Regulation Number 19 of 2005 concerning National Education Standards in the explanation of Article 28, paragraph (3), point a, clearly describes that "Pedagogical Competency is the ability to manage student learning, which includes understanding students, designing and implementing learning, evaluating learning outcomes, and developing students to actualize the various potentials they have." According to Panda (2012:34) "teacher pedagogical competence is the ability and desire to regularly apply attitudes, knowledge and skills to promote learning from teachers and students". Meanwhile, according to Hakim (2015:2) "a teacher's pedagogical competence is the ability to organize learning, the framework for instruction and implementation, the results of learning evaluations, and the development of students to actualize their potential." It is important to improve teacher pedagogical competence, because teacher pedagogical competence will increase teacher professional competence in teaching. Teachers who have pedagogical competence will have the ability to organize learning material that will be delivered well to their students using various techniques. Teacher pedagogical competency standards have been regulated in Minister of National Education Regulation No. 16 of 2007, which includes 10 Core Competencies and the Ministry of National Education Directorate General for Improving the Quality of Educators and Education Personnel (2010, 39-51) states that pedagogical competency standards contain several sub-competencies, namely: 1) master the characteristics of students from physical, moral, social, cultural, emotional and intellectual aspects; 2) master learning theory and educational learning principles; 3) develop a curriculum related to the subject/field of development being taught; 4) organizing educational learning; 5) utilize information and communication technology for learning purposes; 6) facilitate the development of students' potential and help develop students' potential to actualize their various potentials; 7) communicate effectively, empathetically and politely with students; 8) carry out assessments and evaluations of learning processes and outcomes; 9) utilize the results of assessments and evaluations for learning purposes; 10) take reflective action to improve the quality of learning. Mathematics learning according to the constructivist view is providing opportunities for students to construct or find their own procedures in solving problems. When students give

answers, the teacher tries not to say the answer is right or wrong. However, teachers should encourage students to agree or disagree with someone's ideas and exchange opinions until a reasonable agreement is found. Furthermore, according to constructivist experts, they recommend providing a learning environment where students can achieve basic concepts, heuristic process algorithm skills and habits of collaboration and reflection (Cobb, 1992: 187). One of the goals of learning mathematics is that students are able to develop high-level thinking skills, the strategies and motivation above can help teachers to implement HOTS in the classroom, but not only that, the requirement for teachers to have skills in providing questions that measure students' HOTS is also important and Teachers can also differentiate between HOTS and LOTS learning. The aim of studying mathematics is not only to gain knowledge but also to train students' thinking abilities (Rosnawati, 2009:6). Leading students to have higher level thinking skills is not as easy as turning the palm of the hand, it requires a teacher's process and patience in guiding them.

## RESEARCH METHODS

The method used in this research is a case study, because the researcher wants to know a picture of the real conditions in secondary education units, namely State Middle Schools, in terms of the management of teacher pedagogical improvement in a comprehensive and in-depth (specific, detailed and detailed) manner which cannot be explained by existing research. other. The approach used in this research uses a qualitative approach, because problems related to humans fundamentally depend on observation. To obtain accurate and complete information, complete data collection was carried out from related parties and they were directly involved in management activities for improving teacher pedagogies in State Middle Schools, namely the Principal, Deputy Head of School, Mathematics Teachers, MGMP Community Organizations, other Subject Teachers, and Students. The data collection techniques were carried out by means of in-depth interviews, observation, documentation studies and literature studies. In this case, data triangulation is also carried out by confirming the correctness of the information obtained to the relevant parties so that the information obtained is complete and complementary.

## DISCUSSION

Learning planning includes several activities such as formulating the goals to be achieved in a learning activity, the methods used to assess the achievement of these goals, the learning materials that will be delivered, and the preparation of the tools or media used. Learning process planning includes lesson plans, which contain subject identity, KI, KD, achievement indicators, learning objectives, teaching materials, time allocation, learning methods, learning activities, assessment of learning outcomes, and learning resources. All planning steps in the three schools are in accordance with the planning steps of George R Terry's Management Theory with certain adjustments. Planning essentially prepares what steps or actions will be taken to achieve the expected goals. If one does it effectively, one can reduce the time and effort required. In improving teacher pedagogical competence, planning starts from setting goals, formulating the current situation, identifying conveniences and obstacles, and

developing a plan or series of activities to achieve the goal. Planning to increase teacher pedagogical competence in learning includes; preparation of lesson plans, preparation of teaching materials, preparation of student worksheets, preparation of evaluation tool grids/questions, preparation of assessment rubrics, preparation of assessment sheets, preparation of group practical observation sheets, preparation of performance assessment sheets, preparation of attitude scale tests, and assessment rubrics objective practicum report in accordance with G. R. Terry's management theory. Organizing means a manager coordinates human resources and material resources owned by the organization concerned so that work is neat and smooth. Based on the results of the research findings, it can be interpreted that the three schools have implemented the organization of increasing pedagogical competence effectively. The three schools have carried out organization starting from having a clear organizational structure and dividing the workload according to their respective duties and functions so that they can work optimally in the learning process in accordance with the aim of realizing learning effectiveness. The principal has run an organization related to translating goals and objectives into teacher operational activities, so it appears that the principal is able to translate all activities on the basis of objectives. Based on research findings in the three schools, there are similarities in the impact of increasing teacher pedagogical competence, namely that teachers are more creative and innovative in carrying out the learning process in accordance with understanding the characteristics of students, where teachers can develop a balance between attitudinal, spiritual and social development, curiosity, creativity., cooperation with intellectual and psychomotor abilities. Apart from that, improvements to the system for assessing or evaluating the learning process where teachers can improve the assessment system in accordance with authentic assessment by paying attention to students' learning development. So apart from teachers focusing on teaching, teachers must also know the development of the learning process for each student to assess students' abilities in the aspects of attitudes, knowledge and skills. The development of pedagogical competence that is carried out influences student achievement. This is because teachers who have good competence will have an impact on the implementation of learning, resulting in a quality learning process and improving student learning outcomes. Apart from the academic field, student achievement can also be increased in non-academic fields. This is because teachers in carrying out development pay attention to actualizing the potential of students. So teachers develop the potential of students in various extracurricular fields and take part in various competitions. A competent teacher is a teacher who is able to understand the ins and outs of education and teaching, namely all components related to learning problems, including mastery of teaching materials, management, teaching and learning programs and being able to manage the class. Sudarwan Danim stated that, teacher pedagogical competence includes understanding students in depth, designing learning including understanding the foundations of education for educational purposes, implementing learning, designing and carrying out learning evaluations and developing students to actualize their various potentials. An evaluation of the results of the training activities obtained by the teachers is made into a report and will be followed up by the school principal to make good policies for the smooth running of learning. Apart from that, the principal carries out supervision by creating a supervisory team consisting of seniors and the principal to monitor teachers while teaching by assessing learning tools, teacher preparation

and discipline in teaching. After that, it will be discussed again in the teacher's big agenda meeting. Teachers who are still unable to take part in training or are behind on training materials are encouraged to continue learning to develop themselves with other teacher friends who understand better. Apart from that, teachers can see learning media creations on YouTube to attract students' interest in activities. learn how to teach. The principal also advised teachers to make learning implementation plans that are short but still in accordance with the curriculum and stick to the school's vision and mission.

## CONCLUSION

The management of increasing teacher pedagogical competence in realizing the effectiveness of HOTS-based learning in junior high schools has been oriented towards the principles of teacher pedagogical competence in supporting learning which is in the quite good category. This is because several assessment indicators have been fulfilled from the pedagogical competency aspect. Teachers' pedagogical competence in realizing the effectiveness of HOTS-based learning in the three schools has in principle fulfilled the assessment indicators from the aspect of pedagogical competence, although not fully, including due to time constraints, teacher limitations in technology, and limited facilities. However, the problems in these three schools are not that serious, there are only a few teachers who have a tight time schedule which clashes with their teaching schedule and only a few teachers are less enthusiastic about trying new IT-based things.

## References

- 1) Abdullah, A.H., *et al.* (2016). Mathematics Teachers' Level of Knowledge and Practice on the Implementation of Higher-Order Thinking Skills (HOTS). *EURASIA Journal of Mathematics Science and Technology Education* ISSN 1305-8223 (online) 1305-8215 (print) 2017 13(1):3-17 DOI 10.12973/eurasia.2017.00601a
- 2) Agustyaningrum, N. (2015). Mengembangkan Keterampilan Berpikir Tingkat Tinggi dalam Pembelajaran Matematika SMP. *Jurnal Program Studi Pendidikan Matematika* 4(1):
- 3) Andrian, S. (2020). Developing Strategies and Evaluation Of Hots-Based Learning On Thematic Learning In Elementary School. *International Journal on Islamic Educational Research (SKIJIER)*, vol. 4, No. 2, 2020
- 4) Ansori, M. (2019). English Teachers' Efficacy In Using Pedagogical Techniques To Promote Higher Order Thinking Skills . *Celtic: A Journal of Culture, English Language Teaching, Literature & Linguistics* ISSN: 2356-0401, EISSN: 2621-9158, VOL. 6, NO. 2, December 2019.
- 5) Apriani dan Rianasari. (2019). Designing hypothetical learning trajectory in supporting preservice mathematics teachers to conduct higher-order thinking oriented learning in microteaching course. *The 7th South East Asia Design Research International Conference (SEADRIC 2019) IOP Conf. Series: Journal of Physics: Conf. Series* 1470 (2020) 012014 IOP Publishing doi:10.1088/1742-6596/1470/1/012014
- 6) Ariandari, W. P. (2015). Mengintegrasikan Higher Order Thinking dalam Pembelajaran Creative Problem Solving. *Seminar Nasional Matematika dan Pendidikan Matematika UNY*.
- 7) Budiman dan Jailani. (2014). Pengembangan Instrumen Asesmen Higher Order Thinking Skill (Hots) Pada Mata Pelajaran Matematika SMP Kelas VII
- 8) Cobb, P., W., T., Yackel, E. dan McNeal. (1992). Characteristics of Classroom Mathematics Traditions: An interactional Analysis. *American Educational Research Journal*, 29, 573-604.

- 9) Cobb, P., W., T., Yackel, E. dan McNeal. (1992). Characteristics of Classroom Mathematics Traditions: An interactional Analysis. *American Educational Research Journal*, 29, 573-604.
- 10) Dahlan, Permana, dan Oktariani. (2020) Teacher's Competence And Difficulties In Constructing Hots Instruments In Economics Subject. *Cakrawala Pendidikan*, Vol. 39, No. 1, February 2020 doi:10.21831/cp.v39i1.28869
- 11) Elementary to Master Students in Environmental Learning *Volume 8 Issue 4 (October 2019)*, Pages: 935-942
- 12) Fachrunnisa, M., et al. (2020). Indonesian EFL Teachers Competence in Constructing Lots and HOTS-Based Test: A Case Study in an Indonesian Secondary School. DOI: 10.5220/0008220404680476 In *Proceedings of the 1st Bandung English Language Teaching International Conference (BELTIC 2018)*, pages 468-476 ISBN: 978-989-758-416-9
- 13) Management of Mathematics Based on Higher Order Thinking Skills in Senior High School. *Advances in Social Science, Education and Humanities Research*, volume 511 2nd Yogyakarta International Conference on Educational Management/Administration and Pedagogy (YICEMAP 2019) ATLANTIK PRESS
- 14) Musadad, A. A. 2010. Peran Kepemimpinan, Etos Kerja, dan Persepsi Kepala Sekolah Terhadap Mutu Pendidikan. *Pedagogis*, 145.
- 15) National Council of Teachers of Mathematics. (2000). Principles and standarts for school mathematics. *reston: the national council of teachers of mathematics inc*
- 16) Panda, S. (2012). Mapping Pedagogical Competency of Secondary School Science Teacher: An Attempt and Analysis. *International E-Journal (Quarterly)*, 1 (4), 32-45. Retrieved from [www.oairj.org](http://www.oairj.org).
- 17) Panda, S. (2012). Mapping Pedagogical Competency of Secondary School Science Teacher: An Attempt and Analysis. *International E-Journal (Quarterly)*, 1 (4), 32-45. Retrieved from [www.oairj.org](http://www.oairj.org).
- 18) Ramdiah, Abidinsyah dan Husamah (2019). Understanding, Planning, and Implementation of HOTS by Senior High School Biology Teachers in Banjarmasin-Indonesia. *International Journal of Instruction*, 12(1), 425-440. <https://doi.org/10.29333/iji.2019.12128a>
- 19) Rosnawati. R. (2009) Enam Tahapan Aktivitas Dalam Pembelajaran Matematika Untuk Mendayagunakan Berpikir Tingkat Tinggi Siswa. *Seminar Nasional Penelitian, Pendidikan, dan Penerapan MIPA 2009*. ISSN 978-979-96880.
- 20) Rosnawati. R. (2009) Enam Tahapan Aktivitas Dalam Pembelajaran Matematika Untuk Mendayagunakan Berpikir Tingkat Tinggi Siswa. *Seminar Nasional Penelitian, Pendidikan, dan Penerapan MIPA 2009*. ISSN 978-979-96880.
- 21) Samo, D. D., et al. (2020) Mathematics teacher knowledge in higher-order thinking skill: curriculum, pedagogy, and assessment. *5th Seminar Nasional Matematika dan Pendidikan Matematika (SENATIK) 2020 Journal of Physics: Conference Series 1663 (2020) 012012 IOP Publishing doi:10.1088/1742-6596/1663/1/012012*
- 22) Saryati. (2014). Upaya Peningkatan Kompetensi Pedagogik Guru Sekolah Dasar. *Bahana Manajemen Pendidikan, Jurnal Administrasi Pendidikan*, 2 (1), 669-831. Diakses Tanggal 19 Februari 2018.
- 23) Semester I. *Jurnal Riset Pendidikan Matematika, Volume 1 - Nomor 2, November 2014*
- 24) Sobri, A.Y. (2016). "Model-Model Pengembangan Profesionalisme Guru". *Konvensi Nasional Pendidikan Indonesia (KONASPI) VIII. Malang*.
- 25) Suhaemi dan Aedi (2015). A Management Strategy for the Improvement of Private Universities Lectures' Professional Competencies. *International Education Studies*, 8(12), 241-254. doi:10.5539/ies.v8n12p241.
- 26) Sumaryanta. (2018). Penilaian HOTS dalam Pembelajaran Matematika. *Indonesian Digital Journal of Mathematics and Education*, 8(8), 500-509. <https://doi.org/10.31227/osf.io/zypex>

- 27) Suraiman (2021) Peningkatan Kompetensi Guru dalam Pembelajaran Berbasis HOTS dengan Teknik Coaching Grow-Me di SD Negeri 13 Simpang Tanjung Nan IV Kabupaten Solok.. *Jurnal Pendidikan Tambusai* SSN: 2614-6754 (print) ISSN: 2614-3097(online) Halaman 5436-5441 Volume 5 Nomor 2 Tahun 2021
- 28) Wahid, Abd Hamid, Rizka Afkarina Karimah, (2018). Integrasi Higher Order Thinking Skill (HOST) Dengan Model Creative Problem Solving, *Jurnal Modelling, Jurnal Prodi PGMI STIT NU Al Hikmah, Vol. 5, No. 1, 2018.*
- 29) Waseso, H. (2018). Kurikulum 2013 Dalam Prespektif Teori Pembelajaran Konstruktivis. *TA'LIM : Jurnal Studi Pendidikan Islam, 1(1), 59-72.*
- 30) Waseso, H. (2018). Kurikulum 2013 Dalam Prespektif Teori Pembelajaran Konstruktivis. *TA'LIM : Jurnal Studi Pendidikan Islam, 1(1), 59-72.*
- 31) Yee, F. P. (2009). Review of research on mathematical problem solving in Singapore. In Yoong, K.W., Yee, L. P., & Kaur, B., et al. *Mathematics Educations The Singapore Journey: Series On Mathematics Education Vol. 2. New Jersey: World Scientific Publishing Co. Pte. Ltd*
- 32) Alma, Buchari. (1992). *Manajemen Pemasaran dan Pemasaran Jasa.Edisi ke 2.* Bandung: Alfabeta.
- 33) Anderson, L. W., Krathwohl, D. R. (2001). *A taxonomy for learning, teaching and assessing: A revision of Bloom's Taxonomy of educational outcomes: Complete edition.* New York, NY: Longman
- 34) Anderson, L. W., Krathwohl, D. R. (2001). *A taxonomy for learning, teaching and assessing: A revision of Bloom's Taxonomy of educational outcomes: Complete edition.* New York, NY: Longman.
- 35) Creswell, J. W., & Creswell, J. D. (2018). *Research Design: qualitative, quantitative, and mixed methods approaches. Fifth edition.* Los Angeles: SAGE.
- 36) Diaz, G. dan Maggioli. (2004). *Teacher-Centered Professional Development.* New York : Association for Supervision and Curriculum Development
- 37) Fathani, A.H. (2012). *Matematika Hakikat dan Logika.* Yogyakarta: Ar Ruzz Media.
- 38) Fattah, N. (2004). *Prinsip-prinsip Manajemen.* Jakarta: Bina Aksara
- 39) Fullan, M. & Langworthy, M. (2014). *A Rich Seam: How New Pedagogies Find Deep Learning.* London: Pearson.
- 40) Hamdani. (2011). *Strategi Belajar Mengajar.* Bandung : Pustaka Setia.
- 41) Handoko (2017). *Manajemen Sumber Daya Manusia. Edisi Revisi.* Jakarta : Bumi Aksara.
- 42) Hasibuan, Malayu S. P. (2012). *Manajemen Sumber Daya Manusia.* Jakarta. PT Bumi. Aksara.
- 43) Herujito, Y. M. (2001) *Dasar-dasar Manajemen,* Jakarta: Grafindo Persada.
- 44) Miles dan Huberman. (2009). *Analisis Data Kualitatif.* Jakarta: UI-Press
- 45) Moleong, L.J. (2018). *Metodologi Penelitian Kualitatif. Cetakan ke 38.* Bandung : PT. Remaja Rosdakarya.
- 46) Mulyasa (2012). *Praktek Penelitian Tindakan Kelas.* Bandung: PT. Remaja Rosdakarya.
- 47) Nawawi dan Martini. (2003). *Metode Penelitian Bidang Sosial,* Yogyakarta, Gajah Mada University Press.
- 48) Nawawi, H. (2005). *Manajemen Sumber Daya Manusia Untuk Bisnis yang Kompetitif .Cetakan Keempat.* Penerbit Gajah Mada University Press, Yogyakarta.
- 49) Paul, S. (1997). *Filsafat Konstruktivisme Dalam Pendidikan,* Yogyakarta: Kanisius,
- 50) Ridwan (2004). *Belajar Mudah Penelitian untuk Guru, Karyawan dan Peneliti Pemula.* Bandung : Alfabeta.
- 51) Sallis, E. , (2011). *Total Quality Education in Education, Manajemen Mutu Pendidikan, Terj. Ahmad Ali Riyadi dan Fahrurrozi,* Yogyakarta: IRCiSoD.
- 52) Sanjaya . (2009). *Penelitian Tindakan Kelas.* Jakarta : Kencana.

- 53) Sanusi, A. (2017). *Sistem Nilai Alternatif Wajah-wajah Pendidikan*. Bandung: Nuansa Cendikia.
- 54) Siagian, S.P. (2012). *Fungsi-fungsi Manajerial*. Jakarta : Bumi Aksara.
- 55) Soebagio. (2000). *Manajemen Pendidikan*. Jakarta: PT Ardadizya
- 56) Soedjaji, R. (2000). *Kiat Pendidikan Matematika di Indonesia*,(Cet. 1). Jakarta: Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan Nasional.
- 57) Sofyatiningrum, E. *et al.* (2018) *Muatan HOTS pada Pembelajaran. Kurikulum 2013 Pendidikan Dasar*. Jakarta: Pusat Penelitian Kebijakan
- 58) Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung : CV. Alfabeta,
- 59) Sugiyono. (2018). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- 60) *Pertama*. Penerbit Graha Ilmu. Yogyakarta.
- 61) Suparno, P. (1997). *Filsafat Konstruktivisme Dalam Pendidikan*, Yogyakarta: Kanisius.
- 62) Terry, G.R. (2018). *Prinsip-Prinsip Manajemen*. Jakarta:Bumi Aksara
- 63) Terry, G.R. (2018). *Prinsip-Prinsip Manajemen*. Jakarta:Bumi Aksara
- 64) Terry, G.R. dan Rue, L.W. (2020). *Dasar-Dasar Manajemen*. Jakarta:Bumi Aksara
- 65) Terry, G.R. dan Rue, L.W. (2020). *Dasar-Dasar Manajemen*. Jakarta:Bumi Aksara
- 66) Ulfatin dan Triwiyanto. (2016) *Manajemen Sumber Daya Manusia Bidang Pendidikan*. Jakarta : PT. Grafindo Persada
- 67) Usman (2012). *Metodologi Penelitian Sosial dan Ekonomi Teori dan. Aplikasi*. Bandung : Alfabeta.
- 68) Wahyuningsih (2013). *Metode Penelitian Studi Kasus : Konsep, Teori Pendekatan Psikologi Komunikasi, dan Contoh Penelitiannya*. Madura: UTM Press.
- 69) Wragg, E.C. (2012). *Classroom Teaching Skills. Nicholas Publishing Company (Belajar dan Pembelajaran)*. Bandung: Alfabeta
- 70) Departemen Pendidikan Nasional. (2003). *Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*. Jakarta: Departemen Pendidikan Nasional
- 71) \_\_\_\_\_, (2005). *Undang-Undang Republik Indonesia, Nomor 14 Tahun 2005 Tentang Guru dan Dosen*. Jakarta: Departemen Pendidikan Nasional
- 72) \_\_\_\_\_, (2005). *Peraturan Pemerintah (PP) Republik Indonesia Nomor 74 Tahun 2008 tentang Guru*, Jakarta: Departemen Pendidikan Nasional
- 73) \_\_\_\_\_, (2005). *Peraturan Pemerintah Republik Indonesia Nomor 19 tahun 2005 tentang Standar Nasional pendidikan*, Jakarta: Departemen Pendidikan Nasional
- 74) \_\_\_\_\_, (2016). *Permendikbud Nomor 22 Tahun 2016 mengenai tujuan pembelajaran matematika*. Jakarta: Departemen Pendidikan Nasional