

# Model of Independent Working.docx

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## 2 Model of Independent Working Group of Teacher and Its Effectiveness towards the Elementary School Teacher's Ability in Conducting Mathematics Learning

Isti Hidayah\*, Sugiarto

Semarang State University, Semarang 50229, Indonesia

### Abstract

Referring to the issues of the Working Group of Teacher (WGT) performance which has not been optimized, this research aims to develop a qualified and independent model of WGT, and to know its effectiveness to improve the WGT performance and the elementary school teachers' ability in conducting mathematics learning. This research was conducted using research and development design. The validation of the model involved experts who came from academicians, practitioners, and policy maker. The effectiveness testing of the model was carried out through experimental activities using one group of the pre- and post-test design. The result of the model implementation showed that the compatibility of WGT activities was 80%, the practicability of the model principles was 79.63%, and the independence of WGT was 96.56%. The normalized gain of the effectiveness of the model to improve the WGT performance and the elementary school teacher's ability in conducting mathematics learning was 0.54 (medium category) and 0.37 (medium category), respectively.

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**Keywords:** working group of teacher, elementary school teacher, mathematics learning; research and development

### 1. Introduction

The quality of education in Indonesia, as shown by the students' achievement in all education levels, has become one of the development priorities. Some of determinant factors of the education quality are curriculum, human resources, and facilities. The human resource in the implementation of education which has direct interaction with

\* Corresponding author. Tel.: +628564179497; fax: +624-850-8089  
E-mail address: [isti.hidayah@yahoo.com](mailto:isti.hidayah@yahoo.com)

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the student is teacher. Teacher could be seen as the key factor of the student success because teacher directly interacts with the students in the learning process at school (Winamo, 2002). A qualified teacher is an absolute requirement of a high quality education system and practice to produce high quality student (Kunandar, 2007; Jalal, 2007). The data obtained from the Information Management System of Educator and Staff shows that 84% of the elementary school teachers are under-qualified (Dharma, 2009). This percentage is the highest percentage among the other education levels with the same condition.

The other phenomenon is the low teacher activity in writing scientific paper, as one of teacher's job description in professional development, as shown by State Civil Servant Agency in 2005 (Ministry of National Education, 2005). Out of 1.461.124 teachers, there are 22.8%, 0.16%, 0.006%, 0.001%, and 0.000% in the classification level of IVa, IVb, IVc, IVd, and IVe, respectively. According to the distribution of the classification level, the highest percentage of the level IVa shows that majority of teachers could not be promoted to the next level of classification, because it is needed a scientific paper, however they do not have enough capability to do it (Suandi, 2008).

That circumstance mentioned above which is as well as a process to teacher professionalism, is a quite poor circumstance, therefore it is required to have effective and efficient breakthroughs to achieve the target of the process. From the existed field facts to attain national education quality, problems about the teacher competency should be overcome seriously. Regarding to the points, according to the Indonesia Education Strategic Planning 2005-2009, it has been one of educational policies that quality of education is increasingly directed to a change in instructional innovation, especially effective learning process development. Teacher creativity is required for development and implementation of innovative learning.

The WGT is a group of professional development for elementary school teacher, which is then organized in school organization in order to improve the education quality. The implementation of WGT could be distributed into several groups of teacher based on the grade and the subject they teach. The functions of WGT are: (1) planning activities for a year guided by supervisor or trainer; (2) accommodating and solving teachers' problems in the learning activities through meeting, discussion, learning demonstration, using demonstration, and workshop of teaching aid. Some of the WGT activities aim to receive a continuous training, for instance, when there is a teacher training in higher level but not all teachers have the opportunity to join it.

WGT forum is considered more effective and efficient than training forums held by institutions such as Education Quality Improvement Institution, Higher Education Office, and the Education Office in terms of implementing successful learning, which is appropriate to the characteristics and needs of learners and environmental potential. This is due to the reason that through WGT, teachers have opportunity to discuss potential solution of the problems faced in the classroom. Meanwhile, only representatives of regions usually attend the training, which is organized by the relevant institutions, which each has a student with cultural background that is not always the same.

Research conducted by Alexandria (1992) stated that the key elements of the training are: (1) the introduction of the uniqueness of the child, (2) the importance of direct experience, (3) the assessment of effective and simulative learning environments. Research result by Ekosusilo (2002) showed that regarding to the professional skills of teachers, WGT has the greatest contribution, followed by education level, and smallest contribution goes to coaching/training. When it is examined after such a long time these events took place, of some forms of development or the founding, in the same relative time, and that is able to engage teachers most is WGT. Therefore, it can be said that the profession coaching through WGT is more efficient than that of others.

However, in fact, WGT does not function yet optimally. Various attempts have been created to improve the performance of WGT, such as instructor and core teachers (as trainers), improvement of infrastructure, and quality improvement of WGT management. Nevertheless, the various indicators of education quality has not shown a satisfactory in the WGT performance, but most of the others are still apprehensive (Ministry of National Education, 2008)

Dealing with the result identification problem that WGT performance is not optimal yet, the main problem of this study is formulated as follows: How is WGT implementation model that able to optimize the WGT performance and to improve the teacher's ability in implementing mathematics learning?

## 2. Method

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The study was conducted by using the research and development design. Steps of the design referred to the Dick and Carey model (Gall, Gall, Borg, 2003). The stages of this study are described as follows. The first stage is an action research to obtain model design as model hypothesis. The next stage is a model component development, and then the final step is a formative evaluation. Basic contribution of formative evaluation is to improve the quality of the intervention model development. During the development process, the emphasis is shifting to criteria quality of validity, practicality, and effectiveness. Validity was evaluated by experts (expert validity), the practicality and effectiveness through testing (Van den Akker, 1999). According to Nieveen (1999), model validation can be filled with content validity and construct validity; model practicality is process suitability in the field model material, and the effectiveness of conformity between objectives and model implementation results. The hypothetical model is developed from the conceptual model which is obtained from the exploration result. The exploration is conducted by doing descriptive analysis towards the implementation of WGT and its supportive elements. The development result from the hypothetical model which has been validated by experts is the empirical model.

Subject of the research and development of the WGT model is six groups of teacher from three sub-districts. The research variables are: (1) program plan, (2) organization, (3) leadership, (4) activity control, (5) teachers expectation, (6) facilities, (7) funding, (8) human resources, and (9) performance of WGT. The source of data is document of WGT program and the members of group of research subject. Meanwhile, the research instrument is the researches and questionnaire. Data is analyzed in descriptive narrative manner with simple quantitative calculation (percentage and average).

Components of model developed includes: (1) vision, mission, and objective; (2) the basic principles; (3) strategy of implementation; (4) material (planning, implementation, and evaluation of activities); (5) physical support; (6) evaluation; and (7) requirements of implementation of the WGT model. Model design was developed referring to the conceptual model, descriptive analysis result of the management implementation, and the condition of the supporting components.

Validation of the model design was done through expert validation using Delphi technique (Jakaria, 2009; Widjaya, 2004). By expert, it means it consists of academicians, decision makers, and practitioners. The statistic test of the validation result of the expert was done towards the expert validation in stage two (Ludlow, 1975; Yamin & Kurniawan, 2009). The result of the revised model and the guide of the result of expert validation is the empirical model of WGT, which will be implemented in the trial.

Model trial is the continuance of the formative evaluation stage after the expert validation in the stage of model development. The model trial aims to observe the practicality and effectiveness of the model. The practicality of the model is shown by the compatibility of model implementation in the field with the model. Effectiveness of the model is shown by the compatibility of the objectives or the target and the output of the model implementation, one of them is shown by the improvement of teachers' ability in conducting mathematics learning. The design of the testing employs one pre- and post-test group or experiment design before-after the treatment (Sugiyono, 2008; 2010). The variables measured in this trial are: (1) implementation of process of model developed (conducted at each stage within the model implementation); (2) implementation of the WGT model principles (post); (3) WGT independence (post); (4) WGT performance (pre-post); (5) teachers' competence in conducting mathematics learning (pre-post).

Referring to the purpose of the improvement of teacher competence, in this research is the teacher competence in conducting mathematics learning, the program material of the WGT includes the process standard, innovative mathematics model, and the use of manipulative teaching aids. The materials are determined through the problem identification by the WGT, as one of the planning stage of the WGT using the bottom-up method. In order to determine the effectiveness of the independent WGT model in this research, either ideal or criteria score for each item in the four instruments. The overall ideal score is the output of the multiplication of the highest score, the number of instruments items, and the number of the respondent. While the ideal score of each item is the multiplication output of the highest score and the number of the respondent (Sugiyono, 2010). Furthermore, overall effectiveness is calculated with the following formula:

$$\frac{\text{total scores of respondent s}}{\text{overall ideal scores}} \times 100\%$$

While the effectiveness for each item is calculated with the following formula:

$$\frac{\text{score item}}{\text{ideal score item}} \times 100\%$$

Furthermore, to observe the increasing of the effectiveness of the average pre- and post-test model is calculated using formula normalized average gain, which is the comparison of actual average gain with the maximum average gain. Actual average gain is the score difference of post-test and the average score of pre-test. The formula of normalized gain is called as the g-factor or Hake factor (Savinainen & Scott, 2002) is as follows:

$$g^2 = \frac{S_{post} - S_{pre}}{S_{pre}}$$

Where symbol states the normalized average gain, consecutively state average scores pre and post.

The teacher's ability in conducting mathematics learning is obtained by doing assessment when the teachers implement mathematics learning by using observation sheet. The observation sheet developed based on the standard observation of the portfolio assessment of teachers referring to the process standard.

### 3. Result and Discussion

The output of model trial to test the practicality of the model shows that the output score of the compatibility between the activities stages implemented in each stage and the stage of the model is shown the average implementation an activity of the WGT based on the model stages is 80%. Therefore, it can be said that the independent WGT model is very practical.

The effectiveness of the WGT activities towards the implementation of principles of the independent WGT model overall is 79.63% out of the expectation. The effectiveness of the independent WGT model in overall towards the independence of WGT is 96.56% out of its ideal score. This score is sufficiently high. Effectiveness model of activities of the independent WGT towards the performance of the WGT is shown by the number of effectiveness average gain before and after the implementation of model for WGT performance of 0.54 with medium category. Effectiveness of the WGT model towards teachers' ability to implement the overall learning was demonstrated by the average normalized gain of 0.37, with medium category. While the effectiveness of each indicator with medium category are: Explain the learning objectives or basic competencies to be achieved; convey the material scope and explanation of the activity according to the syllabus description; facilitate learners' interaction among participants and between learners and teachers, the environment, and other learning resources; learners are actively involved in each learning activity, and engage learners in a healthy competition to improve student achievement; facilitate learners to engage in activities that create a sense of pride and learners' confidence; give positive feedback and reinforcement in the form of oral, writing, gesture, as well as gifts to successful learners; give away information to exploring more detail; provide motivation to students who are less active or have not participated, provide motivation to students who lack or have not participated actively; together with learners make a summary/lesson conclusion; provide feedback on the process and learning outcomes, provide feedback on the process and learning outcome. Some indicators get the low score of gain, because the initial score have already been high.

As the material to improve the model, explicitly will be added one activity of "feedback" at the end of the planning stage and implementation. Hence, it is expected that the activities will not be missed or forgotten. The feedback towards the implementation of activities is very important for each member of the WGT.

There is a very interesting finding to be considered as the material to improve the final model which is activities implementation that has implemented the strategy which should have been implemented, which requires the

participants to be more active, creative, and independent; learning while working; intensify group approach; and implement the principles of Plan-Do-Check-Act. However, there revealed discomfort from the participants to work. This is caused by their experiences and competences relatively were not equal, therefore, to optimize the output, tutorial strategy needs to be implemented.

This can be explained that the program implementation in the testing of the effectiveness of the model is still below 40% of the overall programs (1 year) which was determined. Based on the output of the trial and the discussion of final model of independent WGT is shown in Fig. 1.

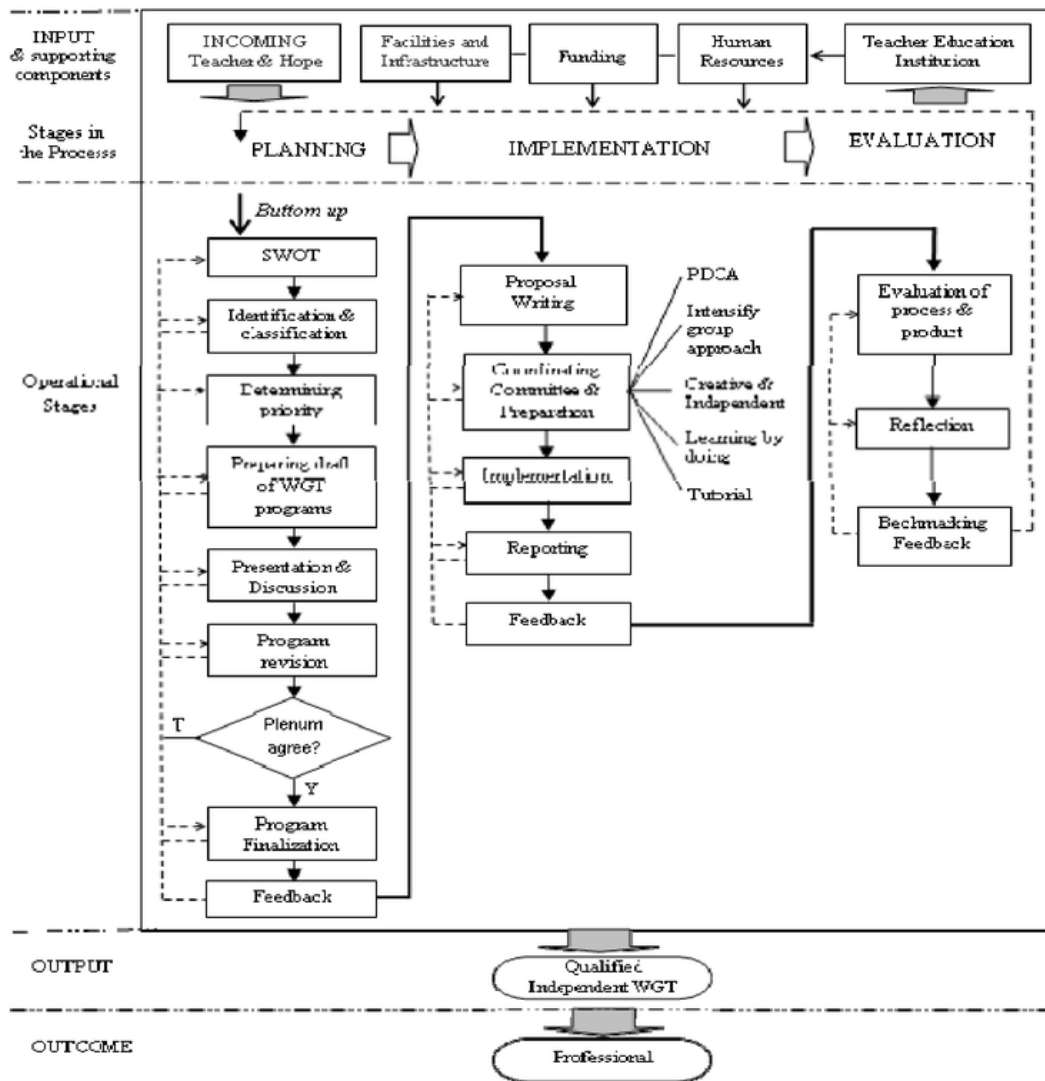


Fig. 1. The Final Model of Independent Working Group of Teacher

### 3.1. The development of the independent WGT model

Since WGT is an organization, then the development of WGT model refers to the development of organization. The development of an organization is related to the changing happen in the organization. Changing itself is an effort to convert something into something else (Robbins, 2007). Wood, Nicholson, and Findley (as quoted in Darwis, 2010) explain that such changing has purposes, namely improvement of organization performance, not only to change but also to make it better than before. The efforts to develop an organization are programmed and systematical approach to generate a changing with target of: (1) improving the effectiveness of organization as an open system, (2) developing potential of every member to possess a real operational competence, and (3) intervening the behavior through cooperation between the management and the members to find better ways to reach the organization or individual purposes.

The true organization development is a way to make all the organization as the target, thus it does not use a micro-approach. Besides, the organization development will not be effective if it only focus on one form of intervention such as training (Siagian, 2007). A research conducted by Ng (2009) bridged quality and innovation, as well as explored various probabilities to do. Ng suggests that it is possible to apply quality approach for innovation process and to apply innovation approach for quality process. The similar study conducted by Prajogo & Ahmed (2007) suggests that empirical data from 194 company managers in Australia show that there is strong and significant relation between product quality and process innovation. Such relation also happen between product innovation and process innovation.

A professional teacher should possess 4 basic competences and 4 important components. The four basic competences are: (1) communication competence, namely the competence to deliver material to the students, (2) collaboration competence, namely the competence to cooperate with the related party/individual in order to improve their practice, (3) technology competence, namely the competence to utilize information technology devices in learning, (4) evaluation competence, namely the competence to conduct assessment towards the students' achievement. While the four important components are: (1) basic knowledge, such as understanding learning theories, always being curious of new knowledge, and understanding students' need; (2) pedagogy, such as improving active learning and emphasizing a high quality pedagogy knowledge; (3) leadership, such as focus on the improvement of students' achievement, put priority on the excellence, and build a networking with all teachers in order to improve the quality; (4) personal attribute, such as being honest, fair, having good personal vision to guide students to reach the learning goal, and always have willingness to do self-evaluation (Dharma, 2009).

### 3.2. Mathematics learning at elementary school

Teachers discuss many problems and topics about their job in the WGT forums. In order to improve quality of the mathematics learning, one of the topics of discussion is how to teach mathematics according to the curriculum. Based on the demand of the government as regulated in the current curriculum, mathematics learning is supposed to be able to fulfill the process standard. The learning which is supposed to happen is the meaningful learning.

Every knowledge or ability could be possessed by the students only if they actively construct the knowledge in their mind. "Constructivism recognize that mathematics must make sense to students if they are to retain and learn mathematics" (Zevenbergen, Dole, Wright, 2004). The mathematics learning would be meaningful if the learning is conducted based on the students' need and students' mental condition. Such learning will be able to involve the students' emotion and thus the learning would be meaningful (Webster-Stratton & Reid, 2004).

Mathematics has abstract objects, while the elementary school students in general think in the sense of concrete operational according to Piaget. Piaget theory, supported by Brunner and Ausubel theory, believes that the students will be able to think if they are assisted by concrete material and manipulative teaching aid. The use of manipulative is then becoming compulsory in the elementary school mathematics learning. Thus the teacher should consider to provide them. Kelly (2006) explain further that if the students think that the teaching aid is only designated for those who are not able to or are difficult to understand the material, then the students will develop a negative response towards the manipulative teaching aid which is unnecessary. The mathematics learning by using manipulative teaching aid or concrete material in exploration or problem solving process will be an important factor for the success of manipulative based-mathematics learning (Kelly, 2006).

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#### 4. Conclusion

Based on the research and the discussion, it is concluded that the WGT model that able to optimize the WGT performance and to improve the teacher's ability in implementing mathematics learning is the model which are: (a) bottom up in arranging the plan; (b) the existence of the agreement towards the program planning; (c) empowerment of WGT members; (d) the implementation of the cycle and integrated management function; (e) the implementation of evaluation towards the performance (process) and output; (f) implementation of activities by implementing the concept of PDCA (Plan-Do-Check-Act), group approach, learning while working, supportive leadership, and innovation; (g) building network with the institution of teacher education; and (h) implementing the sustainable quality development. In overall the activities of the independent WGT model have effectiveness towards the process and product. The implementation of the model principles was as much as 79.63%; independence of WGT was 96.56%; normalized effectiveness gain in overall model towards the performance of WGT was 0.54 (medium category); and the effectiveness of the independent WGT model towards elementary school teachers' ability in implementing mathematics learning was indicated by normalized average gain of 0.37 (medium category).

#### References

- Alexandrea, R. (1992). *Policy and Practice in Primary Education*. New York: Routledge.
- Darwis, A.M. (2010). *Perubahan dan Pengembangan Organisasi*. HOME Darwiswatta Faculty of Social Science UNM Makassar. Online at file:///D:/Teori%20Organisasi/Bahan%20Kuliah%20Teori%20Organisasi%20%20darwiswatta.htm. [Downloaded 07/11/2010].
- Dharma, S. (2009). Arah Kebijakan Peningkatan Mutu Pendidik dan Tenaga Kependidikan, the National Seminar at the Graduate School of Semarang State University, January 4<sup>th</sup> 2009. Semarang, Indonesia, paper.
- Ekosusilo, M. (2002). *Kontribusi Jenjang Pendidikan, Penataran, dan Kegiatan KKG terhadap Peningkatan Kemampuan Profesional Guru*. Jakarta, Indonesia, research report (not published).
- Gall, M.D., Gall, J.P., Borg, W.R. (2003). *Educational Research, an Introduction* (7<sup>th</sup> ed.). Boston: Allyn and Bacon.
- Jakaria, Y. (2009). Uji Coba Model (Validasi), the Research and Development Training conducted by Research Center of Policy and Innovation, Research and Development Office. Jakarta, Indonesia, Ministry of National Education, paper.
- Jalal, F. (2007). Sertifikasi Guru untuk Mewujudkan Pendidikan yang Bermutu, the Unair Graduate Program Seminar, April 28<sup>th</sup> 2007. Surabaya, Indonesia, paper.
- Kelly, C.A. (2006). *Using Manipulative in Mathematical Problem Solving: A Performance Based Analysis*. Available at <http://www.math.umt.edu>.
- Kunandar. (2007). *Guru Profesional, Implementasi Kurikulum Tingkat satuan Pendidikan (KTSP) dan Persiapan Menghadapi Sertifikasi Guru*. Jakarta: Raja Grafindo Persada.
- Ludlow, J. (1975). *The Delphi Method Techniques and Applications* (pp. 102-123). In H.A. Linstone & M. Turoff (Eds.). London: Addison-Wesley Publishing Company.
- Ministry of National Education (2005). *Undang-Undang RI Nomor 41 tentang Guru dan Dosen*. Jakarta, Indonesia, document.
- Ministry of National Education (2008). *Standar Pengembangan Kelompok Kerja Guru (KKG), Musyawarah Guru Mata Pelajaran (MGMP)*. Jakarta, Indonesia, General Directorate of the Educator and Administrator Quality Improvement, document.
- Ng, P.T. (2009). Relating quality and innovation: an exploration. *International Journal Quality and Innovation*, 1, 3-12.
- Nieveen, N. (1999). Prototyping to Reach Product Quality. In *Design Approaches and Tools in Education and Training* (pp. 124-135). London: Kluwer Academic Publishers.
- Prajogo, D.I. & Ahmed, P.K. (2007). The Relationships between quality, innovation and business performance: an empirical study. *International Journal of Business Performance Management*, 9, 380-405.
- Robbins, S.P. (2007). *Perilaku Organisasi* (10<sup>th</sup> ed.). Translated by B. Molan. Jakarta: Macanan Jaya Cemerlang.
- Savinainen, A. & Scott, P. (2002). The Force Concept Inventory: a tool for monitoring student learning. *Physics Education*, 37, 45-52.
- Siagian, S.P. (2007). *Teori Pengembangan Organisasi*. Jakarta: Bumi Aksara.
- Suandi, I.N. (2008). Gerakan Menulis Karya Ilmiah (Sebuah Upaya Peningkatan Profesionalisme Guru). *Jurnal Pendidikan dan Pengajaran*, XXXI, 510-531.
- Sugiyono (2008). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- Sugiyono (2010). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R & D*. Bandung: Penerbit Alfabeta.
- Van den Akker, J. (1999). Principles and Method of Development Research. In *Design Approaches and Tools in Education and Training* (pp. 1-14). London: Kluwer Academic Publishers.
- Webster-Stratton, C. & Reid, M.J. (2004). Strengthening Social and Emotional Competence in Young Children-The Foundation for Early School Readiness and Success. *Infants and Young Children*, 17, 96-113.
- Widjaja, S. (2004). Perumusan Indikator Kinerja Perguruan Tinggi dengan Metode Delphi dan Analytical Hierarchy Process (AHP). *Jurnal Teknologi*, XVIII, 52-62.
- Winarno (2002). *Merancang Model Pembelajaran Matematika Beorientasi pada Pakem dan Pembekalan Kecakapan Hidup*. Yogyakarta: PPG



Matematika.

- Yamin, S. & Kurniawan, H. (2009). *SPSS COMPLETE Teknik Analisis Statistik Terlengkap dengan Software SPSS*. Jakarta: Salemba Infotek.
- Zevenbergen, R., Dole, S. & Wright, R.J. (2004). *Teaching Mathematics in Primary Schools*. Crows Nest NSW: Allens & Unwins.

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