

**THE MODEL OF PROFESSIONAL COMPETENCE – BASED TEACHING SUPERVISION ON HIGH SCHOOL CHEMISTRY (SPK-SMA-BKP)****Katarina Herwanti** ✉

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development**Abstract**

The comprehensive subject mastery and learning strategy are competences which must be possessed by chemistry teachers so that they are able to conduct their teaching professionally. As the time goes by, teachers as the main components in learning process are demanded to continuously grow and develop both their knowledge and skills. Teaching supervision is teaching guidance which is conducted by a supervisors to the teachers by providing professional assistance and service so that teachers become more competent in doing their tasks. Teaching guidance, which has precise and exact targets, conducted meticulously, programmed, and continuously, is very useful for the growth and the improvement of teaching quality and of teachers' career. This study used Research and Development approach. The subjects of this study are 17 Chemistry teachers in Salatiga and 9 supervisors. The aim of this research is to devise the model of teaching supervision for high school chemistry teachers. Several steps were conducted which were 1) describing the model of the current high school chemistry teachers supervision, 2) constructing the model design, 3) validating the model design, 4) piloting the model design, 5) constructing final model of professional competence – based teaching supervision on high school chemistry (SPK-SMA-BKP). This teaching supervision model requires a supervisor which is competent in supervising chemistry teaching, masters all high school teaching competencies, understands the basic principles and is experienced in conducting professional development continuously. In order to ensure the fulfillment of supervision's aim, the teaching supervision will be conducted three times for each period of supervision so that the profile of chemistry teachers' performance can be obtained comprehensively. Consequently, the diagnosis of strength and weaknesses can be conducted which leads to teaching supervision suitable for the needs of chemistry teachers.

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INTRODUCTION

Chemistry is one of the subjects considered as a difficult one for most high school students (Wiseman, 1981). Kean and Middlecamp (1985) argue that the difficulty in learning chemistry is related to the characteristics of the chemistry themselves which are: 1) most of the topics in chemistry are abstract; 2) chemistry is simplification of the real science; 3) the material in chemistry is sequential and develops fast; 4) chemistry does not only deal with the problems consisting of numerical exercises but also with facts in chemistry, rules in chemistry, and technical terms in chemistry; 5) There myriads of materials to cover in chemistry subject. All five causes of chemistry learning difficulty are related to the source of difficulty in learning the chemistry.

Arifin (1995) argues that there are three sources of learning difficulties in chemistry subject: 1) difficulty in understanding technical terms in chemistry; 2) difficulty in understanding concepts in chemistry; and 3) numerical difficulty. Those sources of difficulties in learning chemistry demand chemistry teachers to possess specific skills in learning process so that the chemistry subject becomes more understandable for the students. Chemistry is a branch of science which deals with inquiry about what, why, and how in natural process related to the composition, structure, alteration, dynamics and energy of substances. In order to be able to conduct chemistry teaching properly, teachers must understand the ontology of chemistry well.

Core competences of teachers include subject mastery, concept and materials mastery for the subjects that the teachers teach. Not to mention, teachers must be able to develop their material creatively (Kunandar, 2007: 78). Therefore, teachers are not only demanded for their subject mastery but also for their creativity in material development. In order to be able to develop material creatively, teachers must make use of school surroundings. In relation to professional competence, chemistry teachers must deliver their subjects: 1) to enable students to have analytical and logical skills, to develop

students' scientific ethos (honesty, objectivity, open-minded, perseverant, and critical); 2) to enable students to work cooperatively with others; 3) to be able to utilize students' experience as a basis of material development; 4) to be able to develop science, life skills, and confidence; 5) to be able to create simple technological work related to human needs; 6) to be able to develop learning media design, and conduct experiment in the laboratory. In order to meet those demands, guidance is required through effective and efficient teaching supervision.

Teaching supervision is guidance conducted by the supervisors to teachers by giving assistance or professional service so that teachers become more competent in their field. The orientation of teaching supervision for chemistry teachers is to improve teachers' performance in learning process. The aforementioned performance means that how teachers achieve the best achievement, indicated by their success during learning process (Mathis and Jackson, 2006:113). In other word, teaching supervision is a learning activity aimed at assisting chemistry teachers in conducting their job well.

Based on the aforementioned learning supervision orientation above, the good supervision is a supervision based on subject teachers' competence. It means that the guidance material given to the teachers must be based on their actual weaknesses during teaching process. The aim of the guidance is to create increment of teachers' competence in conducting teaching process. If one which is supervised is a chemistry teacher then the aim must be improving chemistry teachers' competence. Consequently, the guidance requires: 1) supervisors who master chemistry subject; 2) supervisors who masters chemistry subject teaching techniques; 3) learning observation indicators which describes chemistry subjects teachers; and 4) continuous program equipped with follow up activities.

Concerning with the importance of teaching supervision in improving chemistry teachers' competence and with the current

supervision, the development of the model of professional competence – based teaching supervision on high school chemistry, especially professional competence. In order for a supervisor to be able to carry out supervision well, he must have sufficient knowledge, interpersonal skills, and technical skills (Glickman, et al, 2007: 11 – 12). It is expected that through supervision, school's vision and teachers' needs can be integrated so that the increment of teaching process quality can be achieved. Every teaching supervision must focus on the quality of the process and quality of the products through their function as quality control (Certo, 2008: 34). In the school context, control in process means supervision to teachers' performance during teaching process management, control in product means supervision towards the results of teaching performance.

RESEARCH METHOD

This study utilized Research and Development approach (R&D) by Borg and Gall (1983:775). The aim of this research is to produce the model of professional competence – based teaching supervision on high school chemistry. There are ten steps in research and development approach. However, the researcher simplifies it into 8 steps which covers literature review, introduction research, needs analysis of expected supervision, constructing model design, validation, construction of hypothetical model, model field test, revision, perfecting the model, and construction of final model. The subjects of this research are 17 teachers in Salatiga and 9 supervisors. The data collection was conducted via questionnaire, observation, interview, and document study. The data was analyzed using quantitative and qualitative approach.

THE RESULTS AND DISCUSSION

SPK – SMA – BKP model was obtained through several steps which were describing the current factual model design of chemistry

teaching, testing the model, and formulizing the final model of professional competence – based teaching supervision on high school chemistry. The model of professional competence – based teaching supervision on high school chemistry is a supervision model which focuses on improving professional competence of chemistry teachers supported by Advance Professional Development for teachers.

Advance Professional Development as mandated by the 16th regulation of National Apparatus Utilization Ministry and Bureaucratic Reformation on 2009 covers self - development, publication, and innovative work. The manifestations of self-development are courses, subject teachers training, or workshops which are relevant with the real tasks. The experience obtained from the self – development trainings is essential to support their tasks as teachers which are to carry out creative, innovative, inspirational, challenging, and fun learning activities for the students. Those surely have positive impacts on the achievement of the expected learning objectives. Not only self-development activities, but also scientific paper publication can support the improvement of teachers' professionalism. Teachers can convey their ideas in form of scientific paper through scientific publication. Scientific papers written by teachers not only are useful for the writer to improve his competence but also is useful for disseminating knowledge and experience to other teachers. Therefore, it can help the development of other teachers in their own respective fields. The functions of scientific publication are to disseminate skills, knowledge, ideas or experience to others through scientific and systematic writing (Supardi, 2012: 37)

The existing supervision model has not fully provided contribution to the improvement of chemistry teachers' professionalism. If those who are supervised are chemistry teachers, then the supervisors must be competent in not only teaching supervision but also chemistry teachers competence. Those two factors are important in conducting optimal teaching supervision, to provide solution for chemistry teachers' problems. Teaching assistance service which

concerns about the improvement of teachers' professional competence and the development of their profession is still absent. Consequently, teachers lack of interest in joining teaching supervision program and are not motivated to improve their teaching skills. Therefore, the aims of teaching supervision which cover teachers' competence improvement, working motivation building, and the development of their profession are not achieved. The model of professional competence – based teaching supervision on high school chemistry can be seen on the figure 1.

The figure 1 can be explicated as follows, The education is aimed at improving the quality of human resources. One of the efforts to improve the quality of human resources is through education in school. In attempt to improve the quality of educational resources,

teachers are the main components of human resources who need continuous improvement and development. The potency of teachers as human resources requires continuous growth and development so that they can do their job professionally. The fast transformation occurring in our society demands teachers to continuously adapt to the development of technology, science, and society's mobility. Teaching supervision fundamentally comes from the belief that teacher is a profession that holds paramount importance in improving the quality of human resources. The profession which is always growing and developing. In order to meet the demands of the development within the society, and to conduct the job professionally, teachers require guidance to improve their quality of their field of task.

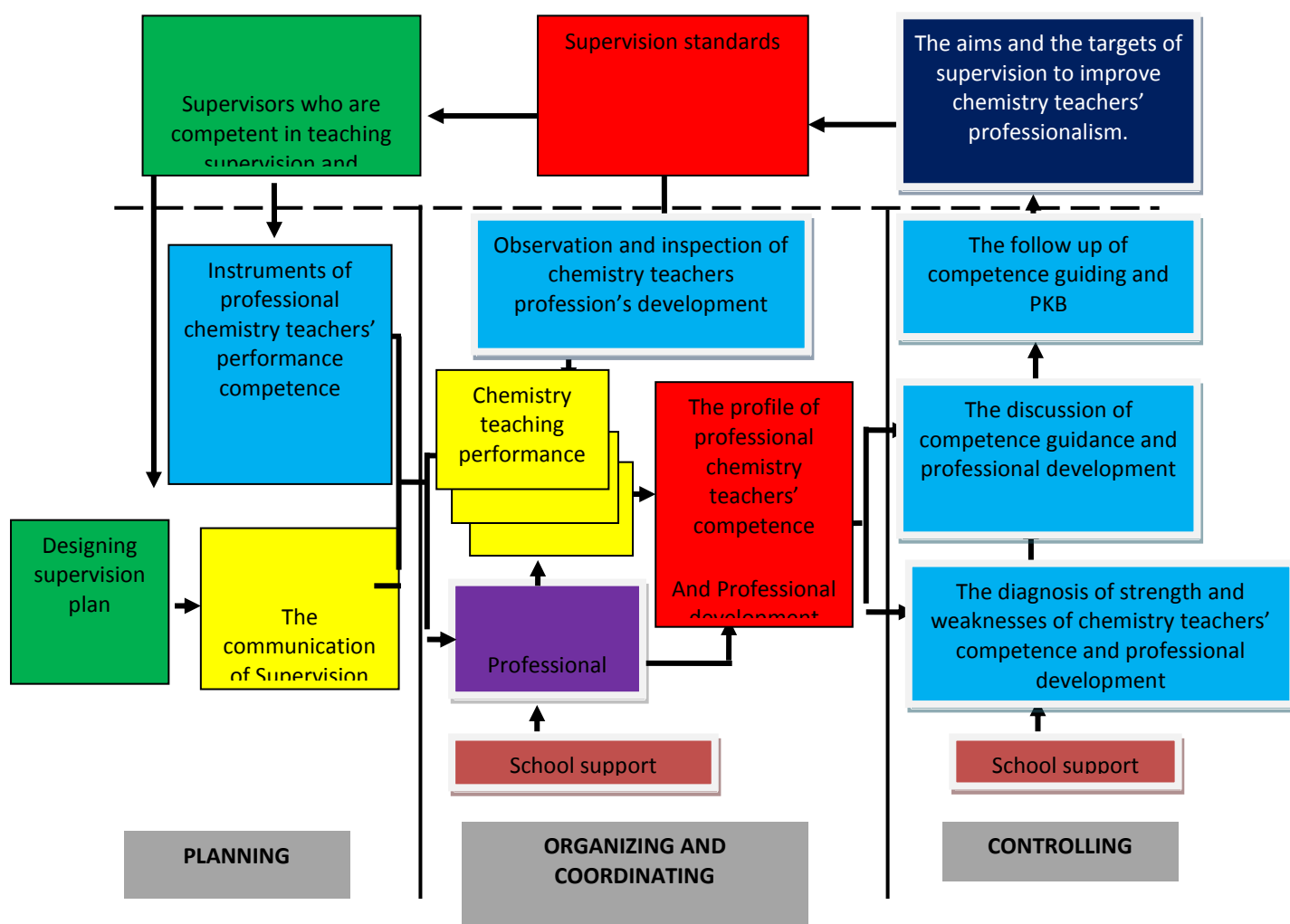


Figure 1. SPK-SMA-BKPM Model

Learning process is the most important part and the core of educational process. In order to achieve high quality education, there must be synergy amongst all components of education, all components must play their role optimally in terms of teaching process, teachers, students, and educational facility. Teachers are the main component in the educational process which play the main role in achieving learning objectives. Professional teachers are able to create innovative, creative, inspirational and fun learning process for the students so that the students are able to learn optimally and gain optimal learning objectives.

The quality of learning process depends of teachers' ability to organize learning process. Therefore, supervision must focus on teachers' professionalism so that it will lead on the quality of learning process. The quality of supervision will be reflected on the improvement of students' learning results. Therefore, the aim of the supervision is not to figure out teachers' mistakes, but more on the effort to improve educational quality through the improvement of teachers' quality.

Teaching supervision is a service or professional guidance for teachers. It means that assistance to develop the better learning process by giving assistance and guidance for teachers to improve all aspects of their teaching quality. This idea is line with Clark and Olumese (2013:8) who argue that essentially teaching supervision is an effort to improve learning and nurture teachers' growth, and improve all learning aspects.

In the perspective of human resources management, workers' guidance is essential determinant to organizational productivity. Professional competence – based teaching supervision is the right strategy for schools because by having proper competence, teachers can achieve high teaching productivity at schools. This view is corroborated by Oreidin and Oloyede (2007) who argue that in order to improve the quality of teaching personnel and teachers, proper supervision is necessary. Supervision significantly affects the quality of

teaching personnel in predicting students' academic performance. Therefore, proper supervision is an important component in developing professionalism in order to learning process.

Bessong and Ojong postulate (2009: 19) that in order to become supervisor, one must really understand the aim of the supervision in order to improve the supervised teachers' teaching skills and productivity. Therefore, a supervisor must have sufficient competence in order to evaluate, guide, and solve the learning problem faced by the supervised teachers. It is relevant with the Glickman et al's (2007: 11-12) supervision model. In that model, it is explicated that a teaching supervisor should have the proper knowledge, interpersonal skill, and technical skills. Those competence can support the supervisors in doing their supervision. The supervisors should provide direct assistance to the teachers, develop team-teaching, improve teachers' professionalism, and develop curriculum, methods and techniques in learning and professional development. It is expected that through supervision, schools' objectives and teachers' productivity can be integrated so that the quality of students' learning process and learning outcomes can be improved. Glickman, et al's argument is corroborated by Certo (2008: 34) who argue that every supervision must focus on the quality of the process and the organizational products through its function as quality control. In the context of school, control towards the process means supervising the teachers' performance in organizing the learning process, and control towards the products means supervising the results of the learning performance.

Competence is very supportive supervisor to supervise the task. Supervision should be able to provide direct assistance to teachers, develop a team of teachers, improving the professionalism of teachers, developing curriculum, developing methods and techniques in teaching, as well as in professional development activities. The hope through supervision will be integrated in a balance way

between school goals with the needs of teachers to increase the quality of students' learning processes and outcomes. Glickman's perspective, et al, are corroborated by the opinions of Certo (2008: 34) which asserts that any supervision activities should focus on the quality of process and product quality organizations through its function as a quality control. In a school context, control over the process of supervising the performance of teachers for managing learning, while control of the product means supervise the performance of the learning outcomes.

The perspectives and expert opinions above are closely linked to the research that researchers do this. A chemistry teaching supervisor should have sufficient knowledge about the characteristics of learning chemistry, chemistry mastery broad and deep, mastering the techniques and strategies in the teaching of chemistry, how to conduct an assessment or evaluation in learning chemistry. A supervisor who does not master the chemistry teaching subjects did not understand the chemistry and chemical characteristics of the learning will not necessarily provide meaningful guidance to help the chemistry teachers who are supervised. This certainly makes the implementation of supervision becomes ineffective because it does not achieve the target goals. The above opinion is corroborated by Sahertian (2002 : 3), which states that the implementation of the teaching supervision should focus on improving the professional capability of teachers to be able to effectively implement the learning process. These activities ultimately lead to the improvement of the quality of education in general.

Models of Teaching Supervision requires supervisors have sufficient competence as a supervisor of teaching chemistry , master the entire high school chemistry teacher competence , understanding the basic principles and experience implementing continuous professional development . The results showed that the model of teaching high school chemistry -based supervision of professional competence has a high degree of effectiveness. This is due to

the competence of supervisors adequate both in terms of acquisition of knowledge and experience as well as mastery supervisor teaching chemistry and characteristics. Such competence teaching supervisor encourages teachers to have any hope of delivering solutions that precisely match their needs and problems related to their duties. The implementation of supervision that highlight the principle of honesty, loyalty and fairness and cooperation that is collaborative to build professional competence to encourage the teachers to be more motivated to fix its shortcomings and work to improve their competence. Thus the implementation of supervision is no longer a formality and emphasis on the administrative aspects of the course, but based on the needs of teachers as well as being part of the quality culture for improving the quality of education in general and in particular the quality of teaching chemistry.

The implementation of supervision in teaching chemistry in the high schools competency-based, both teachers and supervisors are very understanding of their respective duties, and to know the benefits and objectives of the organization of supervision. A good understanding of the purpose and benefits of the implementation of supervision had a positive impact on the success of supervision. Research Sidhu and Fook (2010) with 29 study subjects principals and 60 teachers from public schools in Malaysia, the results showed that school principals and teachers have the knowledge and understanding of the low on formative supervision. Low understanding of formative supervision does not affect the success of teaching supervision. The study also obtain results, there is no balance between the perceptions of school principals and teachers on supervision procedures. According to Sidhu and Fook it was due to oversight process conducted over the hierarchical nature of the collaborative and collective so that supervisors become more directive and didactic. The above findings should be effective supervision is supervision that is conducted collaboratively between supervisors and supervised teachers.

Supervision model that is developed through this research is not only examines the results of observation in the learning aspects of professional competence, but also examines the professional development activities that teachers do. The basis of the model is that the teacher training should be done in a comprehensive. Professional development activities that teachers will complement the performance profile of professional competence chemistry teacher. Experience gained through professional teacher development activities for teachers is very useful in supporting its main task is to educate, teach, guide and evaluate the learning outcomes of students. This is consistent with research Nutcharat and Sumalee (2011). The purpose of the research is to design and develop the practice of teacher competence and the development of a participatory model of supervision. Nutcharat research results and Sumalee show: (1) teachers are very rarely use the media because it took a long time for the preparation and during the teaching process; (2) almost all teachers use the lecture method in providing the materials; (3) although the teachers know that media development and innovation can improve their competence but apparently they still have shortcomings in understanding the manufacture and development of media innovation. Participatory supervision models generate in this study consists of eight components of the model is to create awareness, develop teacher competence using workshops training, develop teachers competence training with learning and learning environment web-based constructivist, share experiences, supervision authentic, on-line supervision, teachers forums, as well as moral and spirit. Nutcharat and Sumalee research focuses on developing an integrated competency of teachers , especially teachers' competence related to the development of instructional media, innovation and technology, as well as the development of a participatory model of supervision while aspects of teacher professional development is not the focus. Excess researchers developed a model of supervision is in addition to focus on particular aspects of observational learning professional competence are also

aspects of teacher professional development that supports the success of the teacher task.

In SPK - SMA – BKP's model, learning observation was occurred more than once in any period of supervision activities to ensure the validity or accuracy of assessment of the performance profile of a teacher learning. The results of the study observations performed three times in each period of supervision activities will result in more accurate data so that it can be used as a basis for diagnosing strengths and weaknesses of teachers. This is consistent with the results of Stephens (2009). In this research, the supervision was done through two field trips through observation and one-time meeting in the middle of the semester. At each observation was occurred interviews related personal and professional development of teachers' practice, especially regarding their leadership inside and outside the classroom. It also discusses the weaknesses or strengths of their teaching practice using a model of supervision that they choose, as well as a way of teaching them the appropriate type of supervision. The findings of these studies are that the success of supervision is highly dependent on many factors, including supervision models are applied, personal teacher supervised conditions, circumstances and conditions during the learning process, and students. These factors greatly affect the success of supervision. Therefore, it is supposed to supervisor provides flexibility for teachers to contribute to determine what type of supervision should be applied, personal circumstances (confidence level), as well as the condition of the class. This supervision model based on the humanistic philosophy that respects that each person has a unique individual. Each teacher was given the opportunity to choose to participate in accordance with the conditions of supervision models, respectively. Such as researchers have developed a model that is also based on a humanistic philosophy that success of supervision is strongly influenced by how the supervisor puts the teacher as a colleague instead of subordinates. Ranging from planning to follow-up efforts of teachers always actively involved in targeting supervision, solving the

problems and follow-up measures to be undertaken. It is important for teachers to feel that they need supervision activities. The success of the supervision is for increasing the competence and career development.

Based on the research and opinions of the experts mentioned above, school had no time to survive the administrative supervision of the teaching paradigm. Administrative supervision will only produce confusion in the supervision. Since the real purpose of teaching supervision to enhance the competence of teachers in improving their teaching practices in order to achieve maximum service to the students. If supervision is still oriented on administration alone, then the observation results do not describe the ideal performance of chemistry teachers. Supervision of the teaching paradigm must be shifted from administrative supervision to be competency -based supervision. This means that all supervisory activities that are performed by supervisors based on the problems (the weaknesses of teacher competence) and the direction of its development aimed for improving teacher competence. The results of competency -based teaching professional supervision are able to provide an assessment of the performance of the teachers, can provide both practical and theoretical guidance to the teacher, and the teachers are able to provide a boost in order to develop self- motivated towards professionalism as an educator and a teacher.

This supervision model from planning to evaluation all are based on competency. Ranging from planning, observation instruments have been prepared to measure the performance of their professional competence through. At the planning stage begins with a discussion of dialogue between teachers and supervisors to establish which aspects of competence that are being targeted supervision. With the goal setting competencies which will be supervised then made more meaningful supervision, it can provide assistance to the teacher in correcting shortcomings in the practice of learning according to their needs.

In addition to provide an overview of the performance profile of chemistry teacher,

supervision models of high school chemistry learning based on professional competence also has the advantage that the existence of studies that support the professional development activities of the teachers in practice teaching assignment. This is appropriate with the opinion of Abiddin (2008:26) which states that the supervision of teaching aims to improve teacher self-development, career advancement, and increasing its ability to provide instruction to students. Data or information on the results of professional development activities can be used as the basis of a follow-up coaching as a result of observation. The data or information on the results of professional development activities will strengthen the observation data of the learning performance. Thus this model of supervision can provide a complete picture of the performance profile of learning and their chemistry teacher professional development activities are carried out, so that efforts to follow up on the results of appropriate supervision will achieve the expected goals of the teachers. To ensure the achievement of the objectives of supervision, observation learning implementation is done three times each period of supervision activities in order to know the performance profile of a chemistry teacher in a comprehensive manner. Then it can be diagnosed the strengths and weaknesses of their competence and effort to do the right coaching as needed for chemistry teachers.

This supervision model is a solution to the shortcomings of existing models of supervision. Learning supervision based on professional competence can be the basis for the further development of subject teachers. This is due to the implementation of supervision based on the condition of teacher competence and oriented to the improvement of the professional competence of teachers and chemistry teacher professional development activities. To determine the effectiveness of supervision models, in this research to test the feasibility of the enforceability of the model performed on respondents consisting of a chemistry teacher, teaching supervisor chemistry, and education practitioners. Model assessment is conducted by

using a questionnaire enclosed in the form of a check list with a score of 1-4 using four variables as well as written feedback from the respondents. The results of the feasibility test of the Model SPK-SMA-BKP can be seen in Table 1.

Table 1. Feasibility Test Results Model SPK-SMA-BKP by practitioners

No	Substance Assessment	Average	Categories
1	Rational Model (arguments about the importance of the model).	7.5	Good
2	The assumption that is used to express the need for chemical-based teaching model of supervision of professional competence.	5.0	Clear
3	Stages of supervisory management functions based teaching professional competence.	10.0	Clear
4	Supervisor in the assignment of teaching competency-based teaching model of professional supervision.	10.0	Clear
5	The assignment for chemistry teacher in the supervision model of professional competence.	10.0	Clear
6	Observation instrument that is used to observe chemistry teacher learning in supervision model of learning based on professional competence.	15.0	High
7	The requirements to implement competency-based teaching model of professional supervision	5.0	High
8	Visualization (images) from the supervision model of learning based on professional competence.	10.0	High

Based on test data on the feasibility of adherence to the model above, it can be concluded that the model -based supervision of professional competence for high school chemistry teacher has a high level of effectiveness. The level of effectiveness can be evaluated from the perspective of feasibility, accuracy aspects of the observed target, as well as the responses of the subjects involved in the trial.

CONCLUSIONS

Based on the results of research and data analysis can be concluded: (1) Supervision of instruction for high school chemistry teacher for this can not be the basis of further development

for teachers. This is due to the implementation of aspect -oriented supervision over the administrative and committed by supervisors who are not proficient in the field of chemistry; (2) Supervision of professional competence based teaching can be the basis of further development for teachers. This is due to the implementation of supervision based on the condition of teacher competence and oriented to the improvement of the professional competence of teachers of chemistry; (3) Models of Teaching Supervision requires supervisors have sufficient competence as a supervisor of teaching chemistry, control the entire competency high school chemistry teacher, understand the basic principles and experience implementing continuous professional development; (4)

Supervision model of teaching chemistry based on professional for chemistry teachers have a high level of effectiveness from the perspective of feasibility and the response of the subjects involved in the trial.

IMPLICATIONS

The implications of this research are: (1) the need for adequate personnel supervisor of the number and academic background; (2) required regulations that manage the implementation and supervision of the field of study for school.

RECOMMENDATION

Suggestions from this study are: (1) the Department of Education must make a change of orientation during the academic supervision is carried out to the subject teachers. Steps that can be done is to replace or enhance the learning observation instrument based on professional competence studies teachers; (2) Schools that do not depend on the supervisor as an academic supervisor, it is necessary to form a team of supervisors of similar subjects; (3) Supervision carried out on an ongoing basis, not just once in each period of supervision activities but three times of observation to be able to generate a comprehensive profile of teacher performance.

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