

# Teacher's Innovation: Efforts to Improve Lecturer Performance through Competence, Motivation and Innovation

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The objective of this research is to develop a model related to improving the performance of mathematics teachers in vocational high schools for technical majors in Central Java. The performance of the teacher is determined by the competency and motivation variables which are moderated by the teacher innovation variable. Using the method the quantitative and model were tested using a sample of several teachers from vocational high schools in Central Java using the purposive sampling method with the help of AMOS 21 software data analysis tools. The results obtained were as follows: This research test results show that the competency variable, work motivation, and innovation have a positive and significant influence on the performance variable. This study also succeeded in showing a positive and significant relationship between the variables of competence and work motivation on the innovation variable. Recommendations can be put forward, especially for mathematics teachers and related parties such as principals, local governments through the Ministry of Education and Culture, and other researchers in the field of education. It can be noted that the importance of continuously improving teacher competency, motivation and innovation of teachers towards certain programs, has an impact on improving teacher performance. These programs include further studies for teachers, professional training, seminars and workshops, which ultimately have an impact on the quality and process of education and learning.

**Key words:** *Performance, competence, work motivation, and innovation.*

## Introduction

One of the main factors that determine the quality of education is the teacher. The teacher is at the forefront of creating quality human resources. The teacher faces directly with the students in the class through the teaching and learning process. In the hands of the teacher will be produced quality students, both academically, with skills, emotional maturity, and moral and spiritual aspects. Thus, future generations will be produced that are ready to live with the challenges of their time. Therefore, a teacher who has high qualifications, competence, and dedication is needed in carrying out his professional duties. The performance of mathematics teachers is basically a performance carried out by the teacher in carrying out his duties as an educator; this is specifically to deliver optimal mathematics learning. The quality of the mathematics teacher's performance will be very decisive in the quality of educational outcomes, because the teacher is the party most directly in contact with students in the process of education or learning in school education institutions. A teacher should have optimal performance in order to realise a quality and high achieving school. First, the teacher must have commitment to students and the learning process. That is, high commitment of the teacher is in the interests of students. Second, the teacher must master in depth the material or subject matter taught and how to teach it to students. That is, between understanding material and learning methods are two things that cannot be separated. The causal relationship between motivation and performance is stated by (Adeyinka, et al 2013), (Mustafa, and 2010). ) that the factors that influence performance are motivations that are formed from the attitude of an employee in dealing with work situations. To explain the statement, motivational related factors in secondary school must be made to create job satisfaction among teachers and a good environment for student academic achievement (Adeyinka, et al 2013). On the other hand, motivation plays an important role in the organisation, because it increases employee productivity and goals can be achieved in an efficient manner. Employee behaviour through motivation can change in any organisation. From situation to situation, the level of motivation is different for each individual (Robbins, Judge, and Sanghi, 2005). Teacher motivation is very important, because it increases teacher skills and knowledge, and because it directly affects student achievement (Mustafa and 2010). Based on the above explanation motivation of teachers is nothing but the process carried out to move the teachers so that their behaviour can be directed at efforts to achieve the stated goals. Motivation of teachers see through (1) the desire to be responsible, (2) the urge to achieve, (3) the desire to develop themselves, (4) the desire to act independently. A teacher should have optimal performance in order to realise a quality and high achieving school. Furthermore, competency is needed in performance because competence is an activity that arises from a person due to a process of knowledge, ability, interpersonal skills, and technical skills. Efforts can be described as the motivation shown to complete work. In line with the above performance, the teacher should as much as possible improve performance gradually and continuously. This aims to meet teacher competency standards to improve

student achievement. From the results of preliminary observations, the authors looked at several problems that need to be further investigated to produce a change towards the better. Among other things, there are still teachers who violate school discipline and there is a lack of discipline present at school as well as in learning and planning. Also, they do not collect the results of exam corrections on time and often even leave class in school hours when lessons are still ongoing.

Based on the background of the above problems in this study, we want to try to analyse empirically to build a model related to the improvement of teacher performance in secondary schools and fill the gap between the competency and motivation of teacher work through teacher innovation.

### **Literature Review and Hypothesis**

Performance is a skill, attitude, behaviour and action, while the competence of a teacher shows the characteristics of knowledge, skills, attitudes and experiences to do work according to their respective abilities (Wirawan, 2009: 9-10). Johnson (1980: 12), describes a component of competence that does not favour competencies related to professional education, such as mastery of theory, principles, strategies and techniques of education and teaching. In fact, changes in lifestyle that occur today have an impact on the learning paradigm changes. The learning paradigm has changed from teacher-centred, teachers to learner-centred (student-centred). Changes in the learning paradigm are closely related to the demands of the competency of mathematics teachers in the upper secondary school. Teacher competency is a sign of perception, values and beliefs taken by individuals when he/she enters teacher training programs (Bhargava and Pathy, 2011). This is also supported by Hirst (1990); Koetsier, Wubbles and Korthagen (1997) and the same thing was also expressed by Joram and Gabrielle (1998); Anderseon, Blumenfield, Pintrich, Clark, Marx and Peterson (1995); bubble (1992); Zeichner and Gore (1990) which states that most teachers follow a program that is believed to be a set of skills which can improve teacher competence. Wade and Moor (1992) Anderseon, Blumenfield, Pintrich, Clark, Marx and Peterson (1995); bubble (1992); Zeichner and Gore (1990) also stated that teachers need pedagogical knowledge and training to develop their own competencies. Teacher competency is a set of knowledge, skills, and behaviours that must be owned, internalised and mastered by the teacher in carrying out their duties in a dignified and responsible manner Anderseon, Blumenfield, Pintrich, Clark, Marx and Peterson (1995); Bubble (1992); Zeichner and Gore (1990). Senior high school (SHS) professional mathematics teachers are important determinants of quality education processes. To become (SHS) teachers in professional mathematics schools, (SHS) teachers must be able to find identity and actualise self in accordance with the abilities and rules of their professional (SHS) teacher. Furthermore, in the effort of self-development, (SHS) mathematics teachers are encouraged to be more

creative, innovative and accelerate themselves to master the substance of mathematics and mathematics curriculum subjects, and have the potential to develop mathematical skills of learning mathematics that will be very useful in everyday life, whether for those who will pursue careers in science or not. This research is a development of previous research conducted by Suwiyadi (2016), which examined the performance of mathematics teachers in technical vocational schools, but in this study I tried to examine the performance of mathematics teachers in high schools.

Research hypothesis is as follows.

1. H1,H2,H3: Math teacher's motivation, teacher's competence and teacher's innovation influence the maths teacher's performance.
2. H4,H5: Maths teacher's work motivation and competence influence maths teacher's innovativeness.

### **Research Methods**

The method used in this research is the survey method with the quantitative research approach and inferencing method. This type of survey research focuses on disclosing the causal relationship between each research variable. The dependent variables in this study were teacher performance and three independent variables, namely, the competence of mathematics teachers, work motivation of mathematics teachers and senior mathematics teachers of innovative high schools in the province of Central Java. Data on the variables of mathematics teacher competency, work motivation of mathematics teachers, mathematics teacher innovations and mathematics teacher performance collected by questionnaires, were compiled based on the indicators of each variable for mathematics teachers.

The population in this study were all high school mathematics teachers in Central Java Province who had worked at least 3 years and a minimum level of education in Mathematics Education (Bachelor). Models in the test were an affordable population of 180 people, and the number of mathematics teachers who became the sample in this study amounted to 180 people. Sampling refers to the use of analysis with LISREL (Ghozali, 2008: 13). The proportional technique with Middle School Central Java Province refers to the presentation of the number of mathematics teachers taken at each high school in a proportional random sampling manner.

## Results and Discussion

Figure 4.1. Full Model SEM

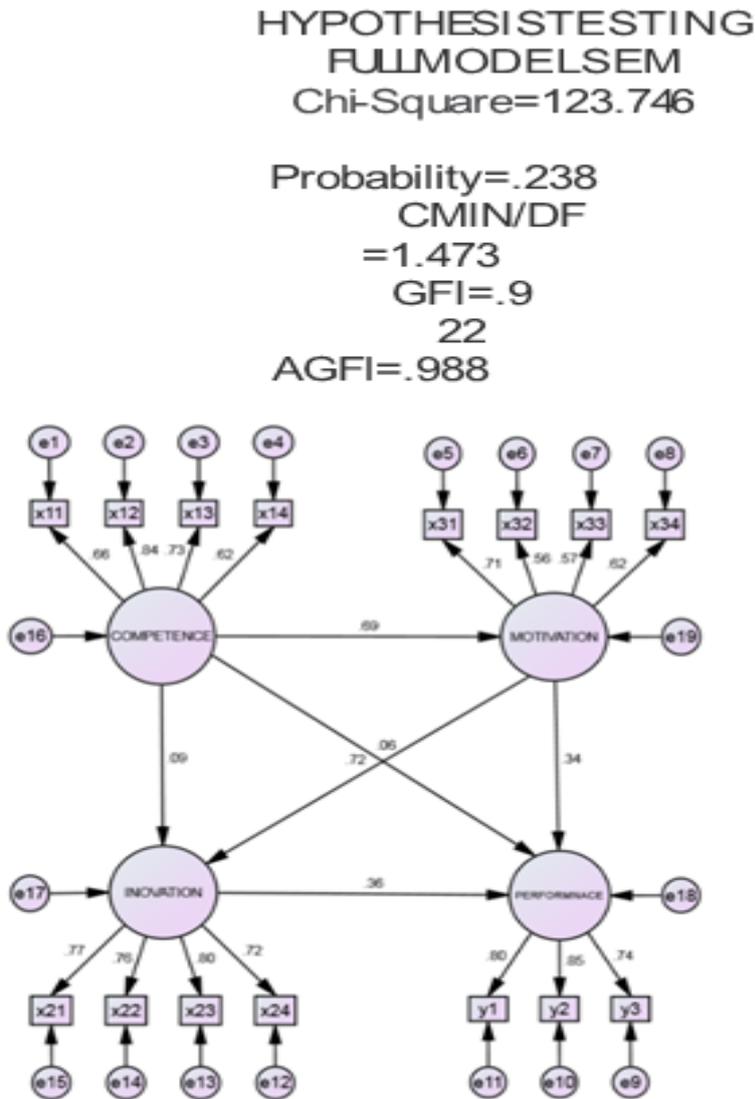


Table 4.1: Index Feasibility Testing Full Model SEM

Goodness of fit Index	Cut -off Value	Result Analysis	Evaluation Model
X <sup>2</sup> Chi-Square	Expected to be small	123.746	Good
Significance Probability	≥ 0.05	0.238	Good
RMSEA	≤ 0.08	0.069	Good
GFI	≥ 0.90	0.922	Good
AGFI	≥ 0.90	0.988	Good
CMIN/DF	≤ 2.00	1.473	Good
TLI	≥ 0.90	0.960	Good
CFI	≥ 0.90	0.968	Good

**Table 4.2:** Regression Weights Full Model SE

			Estimate	S.E.	C.R.	P
F1	<---	F2	.573	.089	6.425	0.000
F3	<---	F2	.466	.093	1.717	0.000
F3	<---	F1	.673	.139	4.859	0.000
F4	<---	F1	.447	.241	1.857	0.000
F4	<---	F3	.508	.202	2.519	0.000
F4	<---	F2	.370	.123	3.573	0.000
x11	<---	F2	1.000			
x12	<---	F2	1.001	.109	9.186	0.000
x13	<---	F2	.944	.111	8.476	0.000
x14	<---	F2	.805	.108	7.476	0.000
x31	<---	F1	1.000			
x32	<---	F1	.920	.134	6.846	0.000
x33	<---	F1	.916	.131	6.990	0.000
x34	<---	F1	1.036	.137	7.558	0.000
y3	<---	F4	1.000			
y2	<---	F4	.963	.087	11.056	0.000
y1	<---	F4	.963	.091	10.631	0.000
x24	<---	F3	1.000			
x23	<---	F3	1.132	.110	10.296	0.000
x22	<---	F3	.931	.094	9.887	0.000
x21	<---	F3	1.108	.112	9.912	0.000

## Discussion

The results of the first test of the second hypothesis indicate that there is a positive and significant correlation between the motivation of working mathematics teachers on the performance of mathematics teachers in Central Java. This supports the research conducted by Suwiyadi (2012) previously made for mathematics teachers in the city, This finding also supports research conducted by Ekosiswoyo (2003) and Tatik (2010), the findings of this study also support previous research that there is a positive relationship between teacher work motivation and teacher performance (Adeyinka, et al, 2013; Robbins, Judge, and Sanghi, 2005 ). This finding also supports research that teacher performance is influenced by teacher work motivation, if performance improvement will affect the value of student achievement level (Mustafa and Othman, 2010). Performance and motivation are things that continue to interact. Performance is an embodiment of the dimensions of behaviour, while motivation is an internal dimension of one's behaviour.

The results of testing the second hypothesis show that mathematics teacher competence has a positive and significant effect on the performance of mathematics teachers. Thus the competence of mathematics teachers is the most important variable in improving the performance of mathematics teachers.

These results are consistent with the study of Suwiyadi (2012) which shows that mathematics teacher's competence directly has a positive effect on fluctuations in mathematics teacher performance variables. This finding also supports the research conducted by Liu, et.al, 2005; Collings, et.al 2010; Anwar, et.al, 2012, states that competency influences performance, and these findings also support previous research which shows that there is a positive relationship between competency and performance (Levenson, et.al, 2006, Ryan et al 2009; Gammie and Joyce, 2009 ). The results of this study also support the research conducted by Connie (2011) which states that competence has a positive effect on the performance of secondary school teachers.

Mathematics teacher competency is a means of mastering theory that is high, and principles, strategies and techniques of education and teaching are also high. This shows that mathematics teachers have succeeded in making mathematics subjects a favourite for students, because mathematics teachers are the parties most directly related to students in the process of mathematics learning.

The results of testing the third hypothesis indicate that innovative mathematics teachers are positive and this has a significant effect on the performance of mathematics teachers. Thus innovative mathematics teachers are the most important variables in improving the performance of mathematics teachers. This is in line with the research of Suwiyadi (2012) and Connie (2013); this finding is also consistent with research conducted by Pedro (2010) which states that innovation as a process of dynamic change can provide added value in the education process which will result in improved educational performance. Suharsaputra (2012) states that changes that occur in society both through input and society as a whole, require that teachers improve their ability to do their jobs. Mathematics teachers need to develop new ways to improve the quality of students in accordance with the data obtained in the field. Mathematics teachers who have high innovations will make innovations and continually adjust their learning with changes or dynamics in the community so that it impacts on performance.

Testing the fourth hypothesis shows that mathematics teacher motivation has a positive and significant effect on mathematics teacher innovation. Mathematics teacher's work motivation is an important variable in improving mathematics teacher's innovation, innovative variables caused by work motivation (Connie, 2013). The high motivation of a maths teacher will bring out and enhance creativity and innovation. In accordance with the facts in the field that maths

teachers who have high motivation to work, will easily make innovations in learning, and impact on innovative mathematics teachers, ultimately improving performance (Innayatullah and Jengahir, 2013; Malik, E., Denmark, R., & Usman, A., 2010; Mustafa, M., & Othman, N., 2010).

The testing of the fifth hypothesis shows that mathematics teacher competence has a positive and significant effect on innovative mathematics teachers. The lower value of competence will certainly influence innovative mathematics teachers especially in the process of learning mathematics (Coonie, 2013). Training programs attended by teachers, will have an impact on improving teacher competency. This competence will encourage teachers to innovate in the learning process (Joram and Gabrielle, 1998; Anderseon, Blumenfield, Pintrich, Clark, Marx and Peterson, 1995; Barghava and Pathy, 2011; Wubbles, 1992; Zeichner and Gore, 1990). Learning manipulation in mathematical concepts in order to improve innovation, is easily done by mathematics teachers, making it easier for students to understand.

## **Conclusion**

Based on the results of the research, discussion and conclusions described earlier, recommendations can be put forward, especially for mathematics teachers and related parties such as principals, local governments through the Ministry of Education and Culture, and other researchers in the education sector, to have continuous teacher innovation towards certain programs so as to have an impact on improving teacher performance. These programs include further study for teachers, professional training, seminars, workshops, which ultimately have an impact on the quality and process of education and learning.

1. Teacher competence has a positive and significant impact on teacher performance. This means that if teacher competence increases, teacher performance will also increase
2. Teacher motivation has a positive and significant effect on teacher performance. This means that if teacher motivation increases, teacher performance will also increase.
3. Teacher innovation has a positive and significant impact on teacher performance.
4. Teacher competency has a positive and significant impact on teacher innovation. This means that if teacher competencies increases, teacher innovation will also increase.
5. Teacher motivation has a positive and significant impact on teacher innovation. This means that if teacher work motivation increases, teacher innovation also increases.

Based on the results of the research and discussion it can be concluded: mathematics teacher competence has a positive direct effect on the performance of mathematics teachers. That is, good mathematics teacher competencies will improve the performance of (SHS) mathematics teachers in the province of Central Java. Motivation of mathematics teacher's work has a direct positive effect on the performance of mathematics teachers. That is, the



high motivation of mathematics teachers will improve the performance of (SHS) mathematics teachers in Central Java Province. Innovative mathematics teachers have a positive direct effect on the performance of mathematics teachers. That is, mathematics teachers who have high innovative performance will increase (SHS) mathematics teachers in the province of Central Java. Mathematics teacher competence directly has a positive effect on innovative mathematics teachers. That is, the competence of good mathematics teachers will increase the innovation of SHS mathematics teachers in Central Java province in innovating tasks and responsibilities. The motivation of working mathematics teachers has a direct positive effect on innovative mathematics teachers. That is, the high motivation of mathematics teachers will increase SHS innovative maths teachers in Central Java province in the innovation of tasks and responsibilities. The results showed, in general, it can be concluded, that the variation in the performance of SHS mathematics teachers in Central Java Province was positively influenced directly by variations in mathematics teacher competencies, mathematics teacher work motivation, and mathematics teacher innovations.

### **Limitation and Future Research**

1. This study uses a sample of vocational high schools, both public and private research, future research can be used to take samples of public schools or private courses in the province of Central Java.
2. For research instruments in addition to using questionnaires, future research must also use secondary data that can be used to determine its influence on teacher performance.
3. Test results affect the dependent variables on teacher performance; further research can use additional variables. Other variables can be used to improve teacher performance, including compensation, job satisfaction, commitment, and organisational culture to encourage teacher performance.



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