

## Competency Model of Science Teacher in 21st Century

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### Abstract

The aim of the research conducted is to develop a structured competency model of science teacher among the science teachers in secondary school. Three variables consist of professional development, perceived organizational support and teacher efficacy are identified to have a significant and positive correlation with teachers' competency. This study used quantitative research approaches with survey method design. Statistical analysis involves descriptive statistics and structural equation modelling (SEM) was used in this research. Analysis is used to test the structured relationship, measurement model and the structural model. The hypothesis of the research conducted based on the literature study and the chosen model framework. In conclusion, this research opens an understanding of the need for continuous effort to incorporate all institutions in order to produce teachers with outstanding personality and in the mean time possesses high competence.

**Keywords:** Teacher competence, Professional Development, Perceived organizational support, Efficacy Teacher, Competency Model Of Science Teacher

### 1. Introduction

Teaching profession in the 21st century exposed the teacher to various challenge in the form of work demands, intellectual, new ideology and issues related to society acceptance (Kereluik, Mishra, Fahnoe and Terry, 2013; Guo, 2014). These challenges require a teacher to own a high level of psychological endurance in terms of both mental and physical. Therefore, teachers' qualities are the most significant factor in determining the efficacy of students.

Teachers are no longer play the role as the presenter of contents alone but must serve as an effective guidance and facilitator as well (Guzey and Roehrig, 2012). The role of teacher must be in accordance with The National Education Philosophy which emphasizes student-centered learning and the enhancement of thinking skills as the teachers' core pedagogical approach nowadays.

The question is, are Malaysian teachers competent enough in addressing these challenges? Do the changes in education system which involving policy and direction plus the success achieved in the world of education or the deficiency which is often an issue may provide the indications on the level of competence of teachers in Malaysia? Teachers are believed still have not reached the level of competence which is educating the students effectively and possess less charisma as a modern teacher (NIE, 2012).

Hence, the research is conducted to identify the influence and relation of the professional development, perceived organizational support and teachers' efficacy toward the teacher's competence. The formation of teacher competency framework which is based on theory in this research is able to give a vivid explanation to construct teacher's competency. Hopefully, this research may break new grounds in the development of teacher's competency model so that the standard of nation education can be enhanced.

## **2. Literature Review**

Teaching profession in this era of globalisation is facing with greater challenges than in the previous era. The development of Information and Communication Technology (ICT) has changed the environment and the people's lifestyle. The ICT revolution has laid the search and the acceptance process of knowledge no longer subject to teachers alone. Information and knowledge can be obtained easily through the internet. Therefore, the greatest challenge to be endured by teachers whether they possess the competence fully in order to prepare and form the future generations. The increasement of competence among the teachers is an obligation in order to give the best in whatever they do.

### **2.1 Teacher Competence**

Sandberg (2000) defines competence as the ability of an individual which refers to the ability based on knowledge, skills and attitude to perform a task that is entrusted with good and excellently. Olaleye and Oluremi (2013), coherence between elements of knowledge and skills inside and outside of the classroom will be able to produce teachers with good communication skills, wise in adapting to the environment and the capable to interpret its ability to give a meaningful contribution especially to school and to the world of education generally.

Goh et al., (2012) and Goh (2013) research have concluded that the high level of competency is able to produce teacher whom is obligated to own obidience to God, has expertise and knowledge in the field, management skills, leadership, effective communication, high work ethics, outstanding personality, contribute expertise possessed and produce innovation and new discoveries. The quality of teacher competence stated are expected to help the Ministry Of Education to develop human capital and students.

### **2.2 Professional Development**

Swaffield (2014) defines teacher professional development as teacher development in his career as it can enhance knowledge, skills and attitude as academic member to fulfill the

teachers' needs to achieve brilliance for the students, society and country. This opinion is supported by (King, 2014; Ghulam, Nasim and Shahid, 2015) explains that the development of teacher professional involve three main feature namely, (1) the revision of knowledge and existing knowledge; (2) renew the skills and knowledge in accordance with the demand of the task and (3) increasement in commitment as the agent of chagement in teaching and learning.

### **2.3 Perceived Organizational Support**

Eisenberger, Cummings, Armeli and Lynch (1997) define it as a level of trust where the employees feel the organization is concerned about the welfare and well-being that include the matter of reward, needs and environment. The high level of organizational support will cause a feeling of obligation to reward the organisation for the benefits received in the form of increasement of effort and attitude beyond role.

Thereotically, administrators support to teachers is a standard for measuring the basic success of a school. In addition, high support of administrators can also give initial interpretation of the willingness of the teachers to the organization through the behaviors that lead to an increase in productivity (Malikeh & Batol, 2013). It is well known that the involvement of the committed organizations support to help teachers carry out its duties effectively is the key formula in determining the success of a country's education system as teachers are the executor of every educational policy.

### **2.4 Teacher Efficacy**

Teacher efficacy is a response of an individual to the level of what is to produce an action or specific skills based on the ability possessed. (Bandura, 1982) defines teacher efficacy as the belief that an individual has the ability to perform a certain behavior. The teacher efficacy plays a major role to affect the behavior and motivation.

An individual who put a high expectation of efficacy teachers tend to be more assertive, motivated and able to achieve better level of performance (Mckinnon & Lamberts, 2014). This view was also supported by Skaalvik and Skaalvik (2014), which explained that teachers who have high level of teacher efficacy are more open minded to accept new ideas, constantly introducing approaches, latest methods and strategies in teaching and learning process.

## **3. Research Model**

Construction of the model of this study is formed from ideas derived from theoretical studies and selected model. Joint research problem, theoretical ideas and references to previous models provides instructions for building a robust research model. Therefore, researchers are using social cognitive theory of (Bandura, 1982), Teachers Competency Development Model (Koster & Dengerink, 2008) and teacher competency model (Kamil, 2014) as the primary source for the construction of the model. Selection theory and the models are based on the concepts and features that fulfill the direction of the study. Modifications process and adjustments are made to the theory and models to ensure research needs are fulfilled.

The main objective of this study is to investigate the relationship between professional development, teacher efficacy and organizational support to the competence of science

teachers. Furthermore, this study aimed to determine whether there is a direct or indirect effect and the effect of the three variables. Hence, this study will identify the role of teacher efficacy as mediator variables. Figure 1.1 is a model framework linking all study variables professional development, organizational support, teacher efficacy and teacher competence.

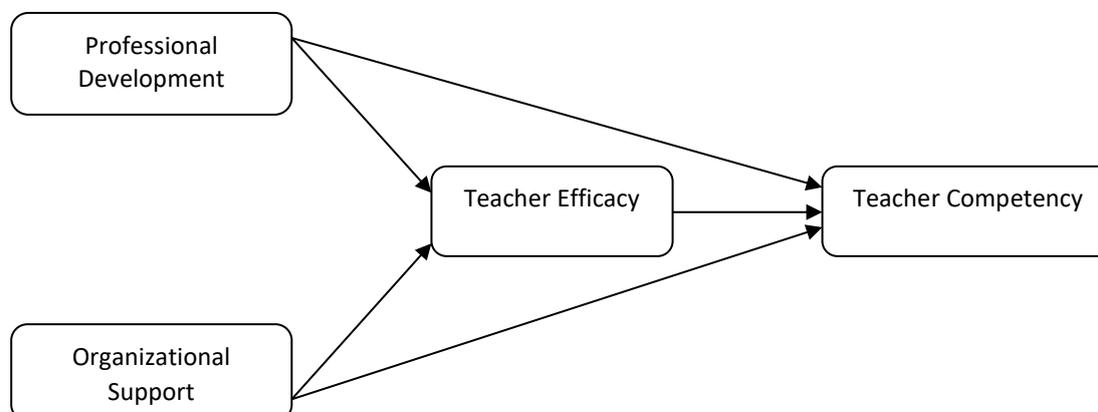


Figure 1.1. Research Model Framework

#### 4. Methodology

This study used quantitative research approaches with the design of the survey methods (Creswell & Clark, 2007). The quantitative research approach that emphasizes the study of phenomena and is controlled through the collection and analysis of data (Punch, 2009; Chua, 2006). The main goal of the survey methods chosen to get an idea of the measurement or view regarding condition or characteristics of the population. This study used a questionnaire as a research instrument distributed to randomly selected respondents consist of science teachers of secondary school.

The instrument was developed through a literature review of previous adaptation. Validity of items obtained through a process of back-to-back translation, face validity and content validity. The expert panel appointed to assess the validity of the item consists of university professors, lecturers teaching institute, officials of ministry of education, excellent teachers and research consultants. Data obtained from the questionnaires were analyzed using Statistical Package for the Social Sciences (SPSS) software. SPSS analysis is to get descriptive statistics to describe the mean, standard deviation and percent.

Analysis of structural equation modeling (SEM) was used to test the model to investigate the causal relationship between the variables in this study. Structural Equation Modeling Advantage (SEM) compared with other data analysis is able to estimate a series of relationship between variables simultaneously and can validate the accuracy of the model (Kaplan, 2009). Structural equation modeling (SEM) was tested with AMOS software version 21 for analyzing value of the factor loading ( $\lambda$ ), exploratory factor analysis (EFA) and confirmation factor analysis (CFA) to determine the validity and reliability of the research instrument. SEM analysis process will establish the measurement model and structural model in accordance with the objectives of the study.

#### 5 Conclusions

Based on research and reading, a study on the teacher's competency in particularly related to the influence of the professional development, self competency and abroad organizations support are the field of research that have been extensively and very popular. The

development of professional development as the core support for teachers has been growing rapidly since the 60s. In Malaysia today, despite the development of professional, organizational support and inculcation of the culture of the teacher efficacy is considered as an important tool in developing the competence of teachers, but not a lot of research, especially with regard to the effect of the three elements of the competency of teachers are conducted. This leads to a lack of knowledge about the attitudes, knowledge and skills of teachers who can serve as a guideline to the parties concerned.

Competency model of teacher expressed will trigger a change in mindset and paradigm in the process of teacher development towards achieving the national vision that has been set. Translations of this teacher competency model as the 'front line' will produce educator with superior character and excellent service to. All parties involved must have the same mental picture of this new aspiration, committed on the same momentum in the move and ready to impedes any challenges which is a prerequisite of success.

Therefore, this study allows the Ministry of Education (MOE) in particular related development program and training preparing teachers with a variety of skills and knowledge to improve the competence of teachers in accordance with the requirements to fulfill the needs of society.

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