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Excellent Teachers' Thinking Model: Implications For Effective Teaching

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Abstract: This study aimed to suggest an Excellent Teacher Thinking Model that has the potential to be utilized in the development of excellent teachers. Interaction survey method using survey questions, observation, document review and interview was conducted in this study. One hundred and five excellent teachers were selected randomly as research respondents. Two sets of instrument constructed and used in this study were Teachers' Thinking questionnaire and Teachers' Teaching Performance observation form. Cronbach Alpha reliability value was between 0.73-0.92 for every component in each division. Multiple regression analysis (stepwise) was used to answer the research questions. R square value ($R^2 = 0.31$) showed that the overall contribution of the two significant variables (expectations and subject expertise) to teaching performance was 31.10 percent. The linear regression equation was $Y = 40.30 + 13.39 (\text{Expectations}) - 1.37 (\text{Subject Expertise})$. Excellent Teacher Thinking Model generated from this study showed that all five components of thinking domain contributed significantly to excellent teachers' teaching performance. Among the five thinking components, teacher expectation showed the highest contribution to excellent teacher teaching performance. This study showed that teacher expectations play a vital role in shaping the objectives, goals, curriculum, and instructional methods of schools. Hence, excellent teachers' professional development programs will help school teachers improve the profession.

Introduction

Excellent Teacher (ET) or Guru Cemerlang pronounced in Malay is an award given to teachers who are regarded as experts in their field of teaching and subject matter. This promotion scheme for teachers was introduced in 1993. In the past, teachers who fitted the criteria were promoted to the post of principals, vice principals or education officers. In getting promoted, the teacher seemed to be moving away from teaching in the classroom to doing administrative work. This means teachers who were dedicated and

expert in their subject matter were lost in the systems; their skills and talent were inaccessible due to their promotion. ET award ensures that even if the teacher is promoted, he/she will still be teaching and his/her knowledge and expertise can be used by the local schools in the district. The Malaysian Ministry of Education has defined ET as teachers with excellent personality, knowledge and skills, excellence work performance, communications, and an excellent potential. The objectives of the Excellent Teacher Promotion Scheme are as follows:

- To acknowledge teachers who are excellent in their field or subject;
- To improve the quality of teaching;
- To be a role model to other teacher;
- To enhance school excellence by utilising the experience and expertise of the Excellent Teacher;
- To expand horizon of promotion in educational services;
- To promote teachers without leaving teaching behind or changing to administrative duties; and
- To give promoted teachers opportunity to get promoted to a higher grade quickly.

This promotion scheme allows graduate teachers with grade DG 41 (Code for teachers' service) to be promoted to DG 44 and non-graduate teachers DG29 to be promoted to grade DG32. Excellent school principals are promoted to DG52 and higher up to Jusa special Grade C (Grade Six out of twelve). Up to December 2007, a total of 2,866 teachers in service have been selected to fill the 'excellent' quota in the various grades. Presently 3,595 teachers are in the process of undergoing programmes to become 'excellent' teachers (NST, 2008).

In an effort to encourage more teachers to perform at the excellence level and enjoy the benefit, the government has increased the quota for Excellent Teachers by 300 percent in 2006. This year the government has agreed to further improvements. Firstly, it reduced the service requirement for emplacement into the scheme from seven years at present to five years. Secondly, those promoted as excellent teachers in a particular grade can be considered for promotion to the next grade without having to wait to complete three full years of service in the grade they are in.

Statement of Problems

Excellent Teacher Promotion Scheme would create healthy competition among teachers to enhance their expertise and give their best to the profession. When it was first introduced in Malaysia, this scheme required seven years of service but now it has been reduced to five years. This rewarding scheme encourages teachers to work hard and improve their performance to achieve the excellent level. This is a challenge to some teachers because a teacher needs to go through a few developmental stages to achieve expertise and excellence level in teaching and learning (Fuller et al. 1975; Dreyfus & Dreyfus 1982; Berliner 1988; Eraut 1989; Kwo 1994; Berliner 1995; Lilia & Abdullah 1998; Turner & Bash 1999). In order to achieve the expertise and excellence level, a teacher needs to go through various challenges and solve different problems in the

classrooms. However, not all teachers are able to overcome the challenges that they face (Kwo 1994; Lilia & Abdullah 1998; Turner & Bash 1999). In fact, they also face difficulties to solve classrooms' problems effectively. Teacher Education Division (1997) report on in-service teacher self-evaluation also showed that teaching problems are not only faced by novice teachers but also by teachers who have attended in-service courses where they faced problems in applying theoretical knowledge in authentic classroom situations (BPG, 1997). According to Lilia and Abdullah (1998), literature reviews show that learning how to teach is a life-long learning process.

According to Pressley and McCormick (1995) excellent teachers' thinking is different from that of other teachers. Case studies on Excellent Teachers reported by The Teachers' Union (NASUWT) in United Kingdom showed that Excellent Teachers had a distinctive role in helping other teachers improve their effectiveness and also had a major impact on improving pupil attainment across the whole school. According to Turner and Bash, 1999, teacher educators should use these resources to help novice teachers develop and achieve their expert and excellent level. Hence, the placement of Excellent Teachers in a particular school should be regarded as an asset to the school community because they can utilize his/her experience and expertise in handling problems and challenges related to teaching and learning.

Conceptual Framework

The conceptual framework designed specially for this research was for the purpose of explaining the role of certain factors that were related to teachers' thinking and directly influenced the teaching performance of the excellent teachers. This conceptual framework was a combination of three sources including thinking and action process model by Clark and Peterson (1986), teachers' decisions planning model by Myers and Myers (1995) as well as the symbolic interaction theory by Mead (1894-1931) according to Ritzer (1996).

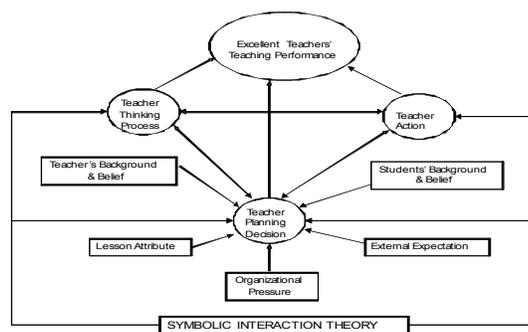


Figure 1: Conceptual Framework of Excellent Teacher's Thinking

The four concepts related to Excellent Teachers' teaching performance in the above framework are:

1. Teachers' thinking process and action (Clark & Peterson, 1986);

2. Teachers' and students' factors that influenced teacher's planning decision (Myers & Myers, 1995);
3. Subject attribute, organizational pressure and external expectation determined teachers' planning decision (Myers & Myers, 1995); and
4. Seven principles of Symbolic Interaction Theory that supported the ability of human being to think and take action as well as the ability to make changes based on their interaction with the environment.

Based on this framework, dependent and independent variables for this research were identified as in Diagram 2.

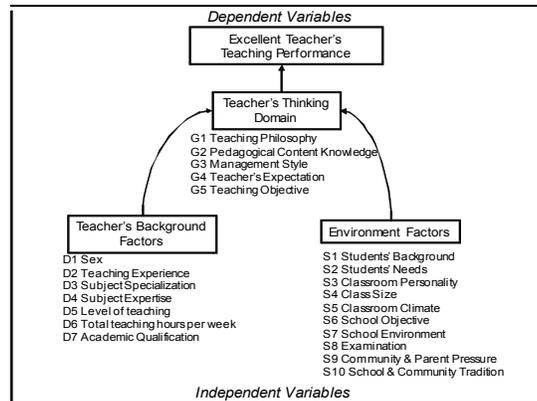


Figure 2: Research Variables Tree

Research Objectives

This research aimed to analyze systematically and empirically the influence of teachers' background factors (D1-D7) and environment factors (S1-S10) on excellent teachers' thinking domain (G1-G5) and teaching performances. The two main research objectives were as follows:

- i) to show statistically the variables that have been the best indicators to determine excellent teachers' teaching performance; and
- ii) to create an Excellent Teachers' Teaching Model that has the potential to produce excellent teachers and to emphasis on the thinking process that focus on excellent teaching.

Research Questions

This research answered the following questions:

- Are teachers' background, environment and teachers' thinking variables the indicators to determine excellent teachers' teaching performance?
- Do teachers' background, environment and teachers' thinking variables directly or indirectly contribute to excellent teachers' teaching performance?

Scope of Research

This research was limited to survey, observation, interviews, and documents review of appointed Excellent Teachers that were teaching in primary and secondary schools in Terengganu and Kelantan states only. The ET sample selection in both states was justified due to the following situations:

- An equal placement dispersion of excellent teachers in urban and rural areas;
- Excellent teachers' willingness to get involved in the research; and
- The researcher identified that excellent teachers' weekly program activities that had been organized by the District Education Office (DOE) and the State Education Department (SED) create a close cooperation between DOE/SED officers, schools and the researchers themselves.

This research involved 105 Excellent Teachers (ET) who were expert in the teaching of Malay language, English language, Mathematics, Science, vocational and technical studies (Living Skills, Agricultural Science, and Home Science Economy) and also other subjects such as Islamic Education, Physical Education, History and Geography. It focused only on variables that were identified in the variables tree.

Research Methodology

This research used a combination of quantitative and qualitative methodology. Various methods or triangulation (Bell, 1993) were implemented for data collection including survey question, observation, documents review and interviews.

Research Design

The research design was structured by dependent and independent variables (Refer to Diagram 3). The classifications of these variables were done based on the research questions. This research used various methods of data collection to find out the significant effects of independent variables on teaching performance. Two sets of research instruments including the Teachers' Thinking Instrument (comprise of 3 sections) and Teachers' Teaching Performance Instrument (comprise of 5 components) were used in this research. These instruments had been piloted and tested earlier in the pilot research. The summary for the overall findings of this research was expected to provide a Path Analysis Model as in Diagram 3.

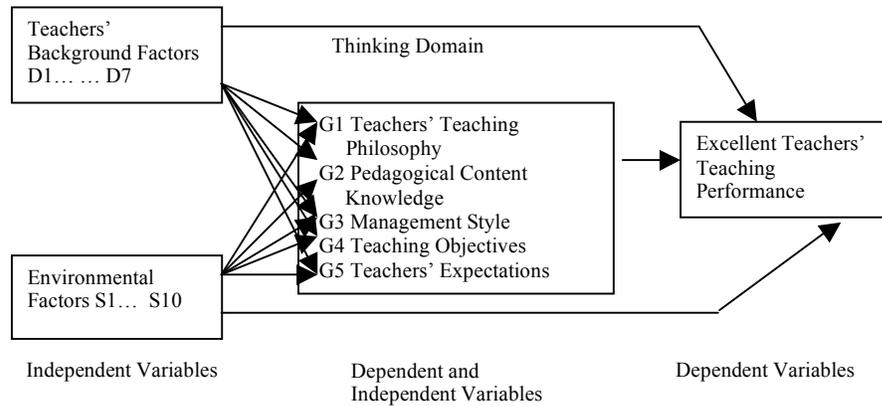


Figure 3: Proposed Path Analysis Model

Data Analysis Procedures

All the data were processed through SPSS 15.0 for Windows program. Multiple regression statistic analysis (*stepwise*) was used to answer the research questions. Multiple regression is a technique that could provide information about the contribution of independent variables to the total variance of dependent variables through index multiple regression correlation coefficient R^2 (Alias, 1998).

In this research, multiple regression statistics was used to estimate the relationship between dependent variable Y (excellent teachers' teaching performance) with seven groups of teachers' background variables (Items D1-D7), ten groups of environment variables (Items S1-S10) and five groups of teachers' thinking variables (Items G1-G5). A path analysis model was developed from the extended multiple regression statistic. Path analysis was used to explain the relationship among a few variables that were analyzed (to answer the second research question).

Research findings

In order to determine the significance of the relationship and contribution from the 22 involved independent variables to the total excellent teachers' teaching performance variable variance, multiple regression analysis (*stepwise*) was carried out. Table 1 and 1 (a) showed multiple regression statistic analysis (*stepwise*) results of 22 independent variables which included teachers' background factors (seven components), environmental factors (ten components) and thinking domains (five components). The results of multiple regression test showed that only two variables explained significantly ($P < 0.05$) the total variance of teachers' thinking performance.

Variables (X)	B	Beta	T	Significant T	R ²	Contribution (%)
Expectation	13.39	0.52	6.32	0.00	0.27	27.00
Subject Expertise	-1.37	-0.20	-2.46	0.02	0.31	4.10
Constant	40.30		5.39	0.00		

Multiple R 0.52; R square value 0.31; Standard Error 9.02

Table 1: Multiple Regression Analysis (Stepwise) for Selected Variables Which Influenced Excellent Teachers' Teaching Performance

Source	SS	MS	DF	F	Significant F
Regression	3752.47	1876.24	2	23.04	0.00
Residual	8305.85	81.43	102		

Table 2: (a) Analysis of Variance (ANOVA)

Multiple regression analysis in Table 1 and 1 (a) showed that expectation variables (27.00%) and specialized subject (4.10%) contributed ($p < 0.05$) to teachers' teaching performance. The entire contributions of these both variables were 31.10 percent. The multiple regression analysis also showed that coefficient correlation which was multiple R between dependent variable (excellent teachers' teaching performance) and overall independent variables was 0.52. R² value was power of two coefficient correlations and also known as power of determination. Results of the research showed the total variances in teachers' teaching performance could be explained by the expectation variable and specialized subject with the percentage of 31.10.

The results of regression analysis showed that the main variables of excellent teachers' teaching performance were expectation ($\beta = 0.52$, $T = 6.32$ and Significant $T = 0.00$) and contribution with the percentage of 27.00. This means that when the expectation score increased a unit, teachers' teaching performance raised 0.52 units. Whereas the second vital variable that gave contribution with the percentage of 4.10 to excellent teachers' teaching performance was teachers' specialized subject ($\beta = -0.20$, $T = -2.46$ and Significant $T = 0.02$). The negative value of the regression index (β) showed that specialized subject provided negative contribution to excellent teachers' teaching performance. Therefore, the wider the gap of excellent teachers' expertise and the tasks that had been assigned to him, the lower his teaching performance would be. This implies that if the gap of the specialized subject increases a unit, excellent teachers' teaching performance decreases 0.20 units. As indicated in Table 2, primary and secondary school teachers' performance has been separately provided. Generally the overall contribution of both variables and equivalent regression are as follows:

$$Y = 40.30 + 13.39 (\text{expectation}) - 1.37 (\text{subject of Excellency})$$

Type of School	Number	Percentage	Equation
Primary	63	60	$Y_1 = 38.256 + 10.560 - 0.871$
Secondary	42	40	$Y_2 = 42.362 + 16.212 - 1.863$

Table 3: Excellent Teachers' Teaching Performance Based on School Categories

Path analysis was used to analyze direct and indirect independent variables as contributing factors (Kelinger & Pedhazur 1973; Alias 1998). To calculate the correlation path for the causal model that was suggested in Diagram 4 and two regression analyses were carried out. Firstly, variable 3 (thinking domain) was regressed towards variable 1 (excellent teachers' background) and variable 2 (environmental factors) to achieve $\beta_{31.2} = \beta_{31}$ and $\beta_{32.1} = \beta_{32}$. Secondly, variable 4 (excellent teachers' teaching performance) towards variable 1, 2 and 3 to achieve $\beta_{41.23} = \beta_{41}$, $\beta_{42.13} = \beta_{42}$ and $\beta_{43.12} = \beta_{43}$.

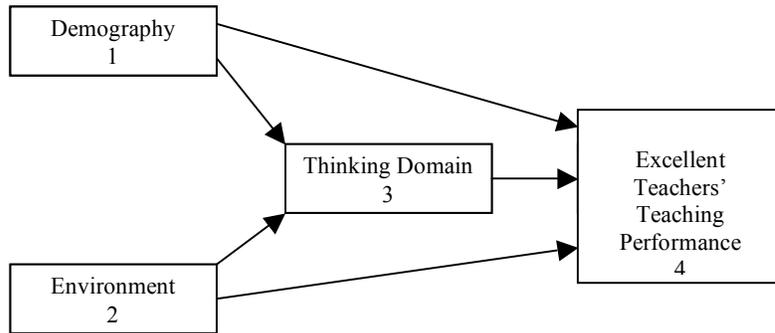


Figure 4: Path Analysis Model for Four Variables

Tables 4 and 5 (below) show path coefficient values including Beta (β) and R square values.

Independent Variables	Dependent Variables Thinking Components				
	Teaching Philosophy	PCK	Management Style	Teachers' Expectations	Teaching Objectives
	Beta (β)	Beta (β)	Beta (β)	Beta (β)	Beta (β)
Sex	0.03	-0.07	0.06	0.07	0.05
Teaching Experience	0.05	0.24**	0.09	0.10	0.01
Specialized Subject	-0.15	-0.21	-0.01	0.02	-0.06
Subject Expertise	0.15	0.05	-0.10	-0.02	-0.07
Level Taught	-0.00	0.12	0.24**	0.08	0.08
Total Teaching Period	-0.19	-0.15	-0.16	-0.27**	-0.15
Academic Achievement	0.02	0.19**	0.05	0.01	0.01
Students' Backgrounds	0.09	0.01	0.07	0.14*	0.12
Students' Needs	0.48**	0.26**	0.15*	0.31**	0.26**
Classrooms' Personality	0.10	0.05	-0.11	0.01	0.02
Class Sizes	0.10	0.16	0.25**	0.08	0.16*
Classrooms Atmosphere	0.13*	0.06	0.03	0.13*	0.08
Schools' Objectives	0.07	0.18	0.01	-0.02	0.10
School Accountability	0.15*	0.19	0.24*	0.09	0.15*
Test	0.19*	0.28**	0.14*	0.09	0.29**
Com. & Parents' Pressure	0.03	-0.12	0.06	-0.09	-0.23
School and Community Tradition	0.16*	0.04	0.03	0.25**	0.03
Adjusted R ²	0.220	0.254	0.215	0.257	0.209

Note: ** p < 0.05 (significant) * p > 0.05 (insignificant and meaningful)

Table 4: Path Coefficient Beta (β) Index and Regression Correlation Coefficient (*Adjusted R²*) Index for Thinking Component on Teachers' Background and Environmental Factors

Path coefficient index (β) and correlation coefficient index (R^2) in Table 4 are the results from the regression variable 3 (thinking component together with thinking domain) towards variable 1 and 2 (teachers' background and environmental factors). Regression analysis findings showed that there were paths that considered variables where its Beta (β) values were statistically significant ($p < 0.05$) and also variables which were not significant but meaningful in term of their conception as long as the Beta (β) values were higher than 0.05 (Aminuddin 1994). Overall there were five models that were identified as shown in column 1-5 in Table 4.

The first column in Table 4 showed that there were five variables which directly affected teachers' teaching philosophy. All these variables contributed 22.00 percent to teachers' teaching philosophy variance. Students' needs ($\beta = 0.48$) was a significant variable whereas test ($\beta = 0.19$), school and community tradition ($\beta = 0.16$) school accountability ($\beta = 0.15$) and classroom atmosphere ($\beta = 0.13$) were insignificant variable but meaningful.

Regression analysis results in the second column showed that there were four variables which directly affected pedagogical content knowledge (PCK). All these variables contributed 25.40 percent to pedagogical content knowledge variance. The four significant variables were test ($\beta = 0.28$), students' needs ($\beta = 0.26$), teaching experience ($\beta = 0.24$), and academic achievement ($\beta = 0.19$).

Moreover, the results from the analysis showed that in the third column there were two significant variables which were the class size ($\beta = 0.25$) and level taught ($\beta = 0.24$) as well as three insignificant but meaningful variables including the school accountability ($\beta = 0.24$), students' needs ($\beta = 0.15$) and test ($\beta = 0.14$). These five variables contributed 21.50 percent to management style variance.

The fourth column in Table 4 showed that there were five variables which directly affected teachers' expectations. All these variables contributed 25.70 percent to teachers' expectation variance. Students' needs ($\beta = 0.31$) was the most significant variables followed by total teaching period per week ($\beta = -0.27$) and school and community tradition ($\beta = 0.25$). Students' background variable ($\beta = 0.14$) and classroom atmosphere ($\beta = 0.13$) were insignificant but meaningful variables.

Finally, the results from the regression analysis in the fifth column showed that there were four variables giving direct effect towards teaching objectives. All these variables contributed 20.90 percent to teachers' teaching objective variance. Two significant variables were the test ($\beta = 0.29$) and students' needs ($\beta = 0.26$). Another two insignificant but meaningful variables were class size ($\beta = 0.16$), and school accountability ($\beta = 0.15$)

Path coefficient Beta (β) index and correlation coefficient (R^2) Index in Table 5 was the results from the regression of variable 4 (teachers' teaching performance) towards variable 1 (teachers' background), variable 2 (environmental factors) and variable 3 (thinking component together with thinking domain). Regression analysis findings showed that there were a few paths which took into account variables where their Beta (β) values were statistically significant ($p < 0.05$) and also insignificant but meaningful variables in terms of their conception.

Independent Variables Teachers' Background & Environment Factors	Dependent Variables Regression of Excellent Teachers' Teaching Performance on Teachers' Background & Environment Factors Path Coefficient Index Beta (β)	
Sex	-0.00	0.05
Teaching Experience	0.08*	0.07*
Specialized Subject	0.01	0.04
Subject Expertise	-0.20**	-0.19**
Level Taught	0.06*	0.02
Total Teaching Period	0.01	-0.03
Academic Achievement	0.03	-0.05
Students' Backgrounds	0.09*	0.11*
Students' Needs	0.11*	0.08
Classrooms' Personality	0.01	-0.01
Class Sizes	0.14*	0.10*
Classrooms Atmosphere	0.07*	0.07*
Schools' Objectives	0.03	-0.05
School Accountability	-0.02	-0.08
Test	0.03	-0.03
Community & Parents' Pressure	-0.04	0.01
School and Community Tradition	-0.01	0.02

Independent Variables Thinking Components & Thinking Domain	Dependent Variables Regression of Excellent Teachers' Teaching Performance on Thinking Components & Thinking Domain Path Coefficient Index Beta (β)	
Teaching Philosophy	0.20*	-
Pedagogical Content Knowledge	-0.03	-
Management Style	0.19*	-
Teaching Objective	0.06*	-
Expectations	0.52**	-
Thinking Domain	-	0.50**
Adjusted R^2	0.298	0.273

Note: ** $p < 0.05$ (significant) * $p > 0.05$ (insignificant and meaningful)

Table 5: Path Coefficient Index Beta (β) and Correlation Coefficient Index (*Adjusted R²*) for Regression Model of Excellent Teachers' Teaching Performance on Teachers' Background Factors, Environment Factors, Thinking Components and Thinking Domain

Regression analysis findings in Table 5 showed that there were a few paths which took into account variables which their Beta (β) values were statistically significant ($p < 0.05$) and variables which their Beta (β) values were insignificant but meaningful variables in terms of their conception. The first phase of Table 5 in column one shows that there were 7 variables which directly affected teachers' teaching performance. On other hand, the second phase of Table 5 in column one showed that there were four variables which directly affected teachers' teaching performance. All these variables contributed 29.80 percent to teachers' teaching performance variance. Teachers' expectation ($\beta = 0.52$) was the most significant variable whereas subject expertise ($\beta = -0.20$) was the second most significant variable. Teachers' teaching philosophy ($\beta = 0.20$), management style ($\beta = 0.19$), class size ($\beta = 0.14$), students' needs ($\beta = 0.11$),

students' background ($\beta = 0.09$), teaching experiences ($\beta = 0.08$), level taught ($\beta = 0.06$) and teaching objectives ($\beta = 0.06$) were insignificant variables but meaningful to excellent teachers' teaching performance.

The second column in Table 5 was the results of four groups of independent variables including teachers' background, environmental factors, thinking components, and thinking domain. The results showed that the only two significant variables to teachers' teaching performance were thinking domain ($\beta = 0.50$) and subject expertise ($\beta = -0.19$). Both of these variables contributed 27.30 percent to teachers' teaching performance variance.

The summary of Path Coefficient Beta Index Analysis in Tables 4 and 5 produced a research model as shown in Figure 5. This model was named Excellent Teachers' Thinking Model.

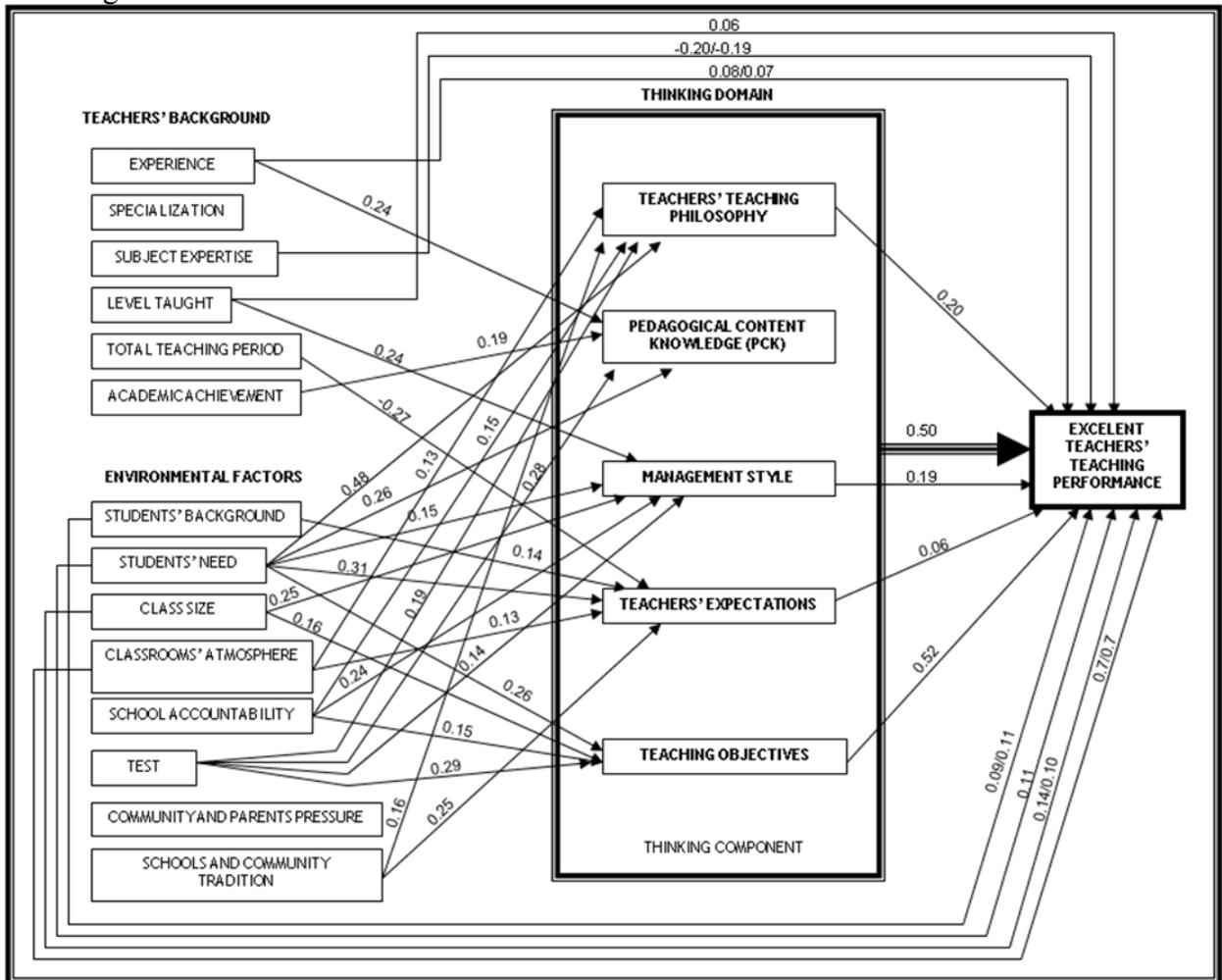


Figure 5: Excellent Teachers' Thinking Model

The Excellent Teachers' Thinking Model that was produced by stepwise regression method showed that there were six blocks which predicted excellent teachers' teaching performance and a block that only predicted one thinking component which was the pedagogical content knowledge. Each of the blocks consisted of independent variables (exogenous) and dependent variables (endogenous). According to Kerlinger and

Pedhazur (1973) exogenous variable was a variable which its variation was determined by causal factors outside the causal model whereas the endogenous variable's variation was explained by exogenous or endogenous variable in the system. In this model, teachers' background and environmental factors was exogenous whereas thinking and teaching performance variable was endogenous. Thinking domain variables were dependent variables to teachers' background and environmental factors but independent variables to excellent teachers' teaching performance. Six blocks that had been the focus of this research were blocks that involved thinking domain variables and their components. The list of the six blocks was as presented below:

Block 1 Excellent Teachers' Teaching Performance and Expectations

Block 2 Teachers' Teaching Philosophy and Excellent Teachers' Teaching Performance

Block 3 Management Style and Excellent Teachers' Teaching Performance

Block 4 Teaching Objectives and Excellent Teachers' Teaching Performance

Block 5 Pedagogical Content Knowledge (PCK)

Block 6 Thinking domain and Teachers' Teaching Performance

As a conclusion, there were 15 exogenous variables (5 teachers' background variables and 10 environment factors) that directly affected endogenous variables (thinking) and indirectly affected endogenous variable (excellent teachers' teaching performance). There was only one exogenous variable the (expertise subject) that significantly and directly affected excellent teachers' teaching performance. Nevertheless, there were four thinking variables that directly contributed to excellent teachers' teaching performance. From the total, there was only one thinking variable that significantly and directly contributed to excellent teachers' teaching performance that is the teachers' expectation.

Conclusion and Suggestion: Implication of Research Findings for Effective Teaching

To be an effective teacher is a continuous process that stretches from the teachers' pre-service experiences in the undergraduate years to the end of their professional career path. Teachers will need ongoing opportunities to develop their knowledge, understanding, skills and abilities to keep pace with the continuously increasing and changing national education agenda.

The Excellent Teachers' Thinking Model (ETTM) can be utilized as a guideline to accelerate teachers' teaching performance. Professional development program for teachers should focus on significant variables that contribute directly or indirectly to teachers' thinking and teaching performance. In this research, the thinking domain ($\beta = 0.50$) contributed directly and significantly to excellent teachers' teaching performance. Generally 27.30 percent of excellent teachers' teaching performance variance was explained by the thinking domain. The direct significant effect shown by the thinking domain on excellent teachers' teaching performance was also a strong correlation effect for five thinking components which included teachers' teaching philosophy, pedagogical content knowledge, management styles, teachers' expectations and teaching objectives. Among the five components mentioned, teachers' expectations

($\beta = 0.52$) was the most significant contributor for excellent teachers' teaching performance.

Hence, to accelerate excellent teachers' teaching performance, development programs should stress on methods to help teachers reflect and analyze their thinking which contributes to increasing their expectations. Teachers' understanding of their expectations will not only help them perform better but also will improve students' performance. According to Bernard (1995), there were few research findings that showed high value of expectations in schools. Brook et al. (1989), Edmonds (1986), Howard (1990), Levin (1988), Rutter et al. (1979) and Slavin et al. (1989) found that schools that put emphasis on high expectation for all the students and at the same time gave sufficient support to achieving the high expectations showed excellent academic achievement. This was followed by Rutter (1979) who found that teachers' high expectation could decrease behavioral problems among students. Brook et al (1989) found that teachers' expectation could decrease the factors that influence teenagers to consume alcohol and drugs. Mehan and friends (1994) discovered teachers' expectation could decrease the number of students who were left behind and the effect of this was the number of teenagers who entered colleges decreased.

Therefore, to increase teachers' teaching performance in schools and higher institutions attention should be paid to the teachers' thinking domain especially to teachers' expectation. This was stressed by Lefton (1997) who pointed out that human's thinking and expectation became a guideline for their attitudes.

The findings also showed that teachers' expectation could be increased with the increase of four environmental factors which are the skills to deal with various students' needs ($\beta = 0.31$), school and community tradition ($\beta = 0.25$), students' background ($\beta = 0.14$), and classroom or school atmosphere ($\beta = 0.13$). Teachers' expectation also can be increased if the number of teaching periods per week were decreased ($\beta = -0.27$) at optimum level. Reducing teachers teaching hours per week could decrease teachers' burden and teachers had more time to attend teachers' developmental program. This initiative would motivate teachers to learn new skills for the purpose of increasing their expertise.

In general, schools and schools' community could implement the following initiatives as suggested by previous studies to state a positive and high value of expectations among teachers:

- structured and organized learning (Weinstein et al 1991);
- preparing a contextual and varied curriculum that could give opportunities for students to succeed in various fields and take into account learning styles and intelligence factor (Gardner 1985);
- schools encourage critical and inquiry thinking as well as the development of critical awareness (Kohl 1994 ; Mehan et al. 1994);
- schools assimilate various culture contents across curriculum;
- heterogeneous group formation and cooperative learning (Wheelock, 1992; Johnson & Johnson, 1990 ; Slavin, 1990)
- using various forms of evaluation including authentic evaluation (Gardner 1985)
- motivate students and cultivate the feeling of responsible towards learning in themselves (Kohn, 1993)

In addition to thinking component, subject expertise ($\beta = -0.19$) showed direct significant effect on excellent teachers' teaching performance. This negative effect showed that excellent teachers' teaching performance would decrease if the gap of excellent teachers in their expertise field and the task that had been assigned to them increased. Thus, those who were responsible as pedagogical leader either in schools or higher institutions had to make sure that their teaching staffs were given responsibilities suitable to their expertise. Apart from that, teachers in schools and instructors in higher learning institutions should be given more opportunities to learn new knowledge suitable to current visions and missions of education. Competency development plan should be carried out to close competency gap.

An approach to staff development was developed by combining teachers' or instructors' learning experiences with their daily activities as suggested by Putnam and Borko (2000). This could be done by organizing activities in schools or education institutions. The activities that enable instructors to communicate with students will not only provide opportunities for them to increase their knowledge but it will also help them to increase their skills to face various students' needs. This scenario was in accordance with the research findings that the environmental factor (the skill to face various students' needs) was a significant variable and directly contributed to four thinking components including the teachers' thinking philosophy ($\beta = 0.48$), teachers' expectation ($\beta = 0.31$), pedagogical content knowledge ($\beta = 0.26$) and teaching objectives ($\beta = 0.26$).

According to Shulman (1986) and Lilia and Abdullah (1998,) pedagogical content knowledge (PCK) enable teachers or instructors to teach specific topic with the purpose of encouraging conceptual understanding of students. In the teachers' context, PCK enables teachers or instructors to think about the teaching of certain subject contents from the students' perspectives. With regards to that, the research findings showed test ($\beta = 0.28$), skills to deal with various students' needs ($\beta = 0.26$), teaching experience ($\beta = 0.24$) and academic achievement ($\beta = 0.19$) needed to be increased. This is because these four variables were significant for PCK. Research findings showed that specialized subject ($\beta = -0.20/-0.19$) negatively affected excellent teachers' teaching performance both directly and indirectly because the expertise subject differed with the specialized subject. In other words, the specialized subject that was learned during teachers' training was outdated and not suitable for the current situation. Hence, this research results suggested the gap of teachers' teaching performance with specialized subject should be decreased. This problem could be overcome by attending courses frequently.

Test variable was also found to significantly affect the teaching mission thinking objective ($\beta = 0.29$) and PCK ($\beta = 0.28$). Therefore, examination planners in the ministry, department or in the education institution level should make sure excellent teachers were given more empowerment to plan examination for their subject. This can enable teachers to set up and arrange strategies or learning activities which are more effective based on the test results that were attained.

Thus, it is hoped that the above suggestion can speed up development of teachers or instructors' Excellency. The strength found in the components of a teacher's or instructor's thinking should be assimilated with the environmental factors and teachers' background. This is to enable them to achieve excellent level of performance suitable for the mission and challenge of education in the new millennium.

Recommendations for Further Research

The following recommendations are made for further research:

- This research can be repeated to a different sample of excellent teachers in other countries to observe the effect of environment variables on excellent teachers' thinking and performance;
- Using qualitative research to internalize excellent teachers' thinking and action process (e.g. thinking aloud protocols); and
- Comparison of excellent teachers thinking and action with novice teachers (focusing on teachers' subject expertise such as Physics, Mathematics etc.).

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