

Factors Influencing Teachers' Perceptions on Teaching Thinking: A Case Study in Kuala Lumpur, Malaysia

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Teachers can be the most important factor to conduct teaching thinking. This study attempts to investigate the factors influencing teachers' perceptions towards teaching thinking. Data were collected from 102 school teachers in Kuala Lumpur, Malaysia. Principle Components Analysis (PCA) revealed three factors: the sense of efficacy, value of teaching thinking, and structure of learning. This study confirmed that teachers perceived certain *internal context factors*, and revealed that *external context factors* also have an impact on their teaching thinking.

Keywords: influencing factors, perception, teaching thinking, case study, Principle Component Analysis (PCA)

Improving students' thinking ability is accepted as an important goal of education, and schools are considered places where thinking skills can be enhanced. To achieve goal of teaching thinking, it is dependent on many factors which mainly come from teachers (Costa, 1998). What teachers say and do in classrooms greatly affect student learning. Many researchers have demonstrated that certain teacher behaviors influence student's achievement, self-concept, social relationship, and thinking abilities (Dunn, 1998; Smith, 2002; Tengku Shahrom, 1994; Thibeault, 2004; Tyler, 2006). These indicate that teachers play an important role in teaching thinking. Hence, many research have been conducted by using teachers' perception to indicate the influence of teachers through their belief and practice which will eventually affect students.

One approach used is to identify teachers' perception which comprise their knowledge in and attitudes toward the purpose, principles, and implementation of curriculum. For this reason, teachers' perception has been repeatedly studied as a means to evaluate the effectiveness of teaching thinking (Ali, 2001; Rosnani & Suhailah, 2003; Salem, 1995).

In the case of Malaysia, Rosnani and Suhailah (2003) have revealed that teachers' perceptions on teaching thinking were influenced by their sense of efficacy and value of teaching. This study attempts to duplicate the study of Rosnani and Suhailah (2003) by employing the case study approach involving some schools in Kuala Lumpur.

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Statement of Problem

Teachers can be the most important factor to conduct teaching thinking. He or she can 'make or break' the teaching thinking which will eventually affect students' learning. If the teachers have a positive perception towards teaching thinking, it can be implied that they can at least conduct the teaching thinking. However, it becomes worrying when teachers have a negative perception. One way of studying and analyzing this issue is to study the relationship between accounts of variations of teachers' perception toward the teaching thinking.

In this study, researchers identified two main research questions;

1. What are the factors influencing teachers' perception towards teaching thinking?
2. Do the results of the hypothesized measurement model replicate those exploratory works which have been conducted earlier?

This study is mainly based on the findings of Rosnani and Suhailah's (2003) research on teaching thinking in Malaysia which revealed that teachers' sense of efficacy and value of teaching thinking influenced teachers' perceptions on teaching thinking. However, these two factors may not be sufficient to reflect the '*realities of implementation*' in teaching thinking. According to the study of Tengku Shahrom (1994) on the implementation of a national computer education project in secondary schools in Malaysia, teachers perceived that the main obstacles to implementing new innovations in schools were not only teachers themselves who lacked knowledge and skills in the curriculum content and inadequate time allocation for teaching, but also other problems such as reference materials, students' weaknesses, and lack of support from their principals and the Ministry of Education.

Similarly, the study of Salem (1995) on teaching thinking skills in social studies curriculum of Saudi Arabian secondary schools discovered that factors affecting the teaching thinking skills included teachers' role in promoting students' use of teaching skills, the participation of student, educational methodology, text and extra-textual materials, educational media, and educational setting.

Accordingly, it can be pointed out that the teaching approach and method and the school and curricula support also play a crucial role in influencing teacher's perception towards teaching thinking. Therefore, this study hypothesized that there are four influencing factors of teacher's perception on teaching thinking: (1) teaching approach and method, (2) the school and curricula support, (3) teachers' sense of efficacy, and (4) value of teaching thinking. (Figure 1 below depicts the conceptual framework of the study.)

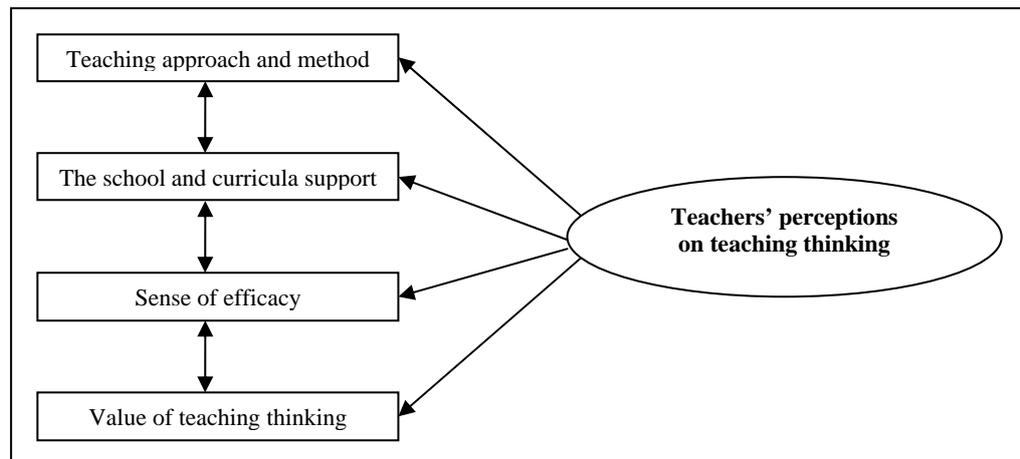


Figure 1. Conceptual framework of study.

Method

Research Design

In this study, the survey method was employed. It was used as it was considered the most efficient method due to time constraint and cost. A questionnaire adapted from Rosnani and Suhailah (2003) measured these relationships. It consisted of two parts. The questionnaires were distributed randomly to a sample of teachers in Kuala Lumpur.

Population and Sample

The population is the teachers in three selected secondary schools in Kuala Lumpur, Malaysia. A random sampling was used to select participants. The principle component analysis (PCA) was conducted where the number of sample depends on the items of the questionnaire. Since the number of the item is 18, the minimum sample size is $18 \times 5 = 90$ participants. In this study, the participants were 102 which were more than the minimum requirement (Hair, et al., 2006).

Instrumentation

The survey instrument used to measure teachers' perceptions towards the teaching thinking was adapted from Rosnani and Suhailah (2003). It comprised 18 items that measured teachers' perceptions toward teaching thinking. It sought to find out teachers' perceptions on:

- (1) teaching approach and method (4 items; no.1-4);
- (2) the school and curricula support (6 items; no.5-10);

(3) their sense of efficacy (4 items; no.11-14); and

(4) their value of teaching thinking (4 items; no.15-18).

The response to each item is in the form of a five-point Likert scale of “strongly disagree”, “disagree”, “undecided”, “agree”, and “strongly agree”. Items 6, 7, and 8 of the school and curricular support were presented in a negative form.

The demographic characteristic of the first section of the questionnaire contains questions with regard to the respondent’s background information (gender, category, specialization, age, and teaching periods per week).

Data Analysis

For the demographic data, frequency and percentage were employed. To answer the research question on factors influencing teachers’ perception of teaching thinking, principle component analysis was utilized.

An explanatory factor analysis was conducted to construct-validate the factor influencing teachers’ perception. To find out the number of factors the following rules were used: (1) the Kaiser’s rule of 1.0 as the minimum eigenvalues, (2) the scree test, and (3) the interpretability of the solutions. The degree of intercorrelation among items justified the application of the factor analysis as well as the Batlett’s test of sphericity recorded a Chi square value.

Results

Table 1 shows out of 102 teachers, 68 (66.7%) were females and 34 (33.3%) were males. Approximately, 61 (59.8%) of the respondents were graduates with the Bachelor’s degree while 37 (36.2%) were non-graduates. The respondents were represented from different subject disciplines with more than half (53%) being language teachers. The other half was distributed between Islamic sciences (17.6%), natural science (12.7%), social science (8.8%), mathematic (6.9%), and the other subjects (2%) respectively.

A majority of the teachers (60.8%) were between 30 and 40 years of age, the remaining being almost distributed between the age group of younger than 30 (25.7%) and older than 40 (12.9%). In general, almost half of the teachers (42.2%) had between 26-28 teaching periods weekly with the 20-22 teaching periods forming the next highest group (18.6%).

Table 2 summarizes the results of the descriptive analysis of the teachers’ perceptions on teaching thinking. The data showed that the mean scores ranged between 3.25 (items Ef12) and 4.53 (items

Table 1
Respondents' Demographic Background

Variables	N*	Percent
1. Gender		
Male	34	33.3
Female	68	66.7
2. Category		
Graduate	61	59.8
Non-graduate	37	36.2
Missing value	4	4.0
3. Subjects		
Language	53	52
Islamic science	18	17.6
Natural science	13	12.7
Social science	9	8.8
Mathematic	7	6.9
Others	2	2.0
4. Age		
<25	1	0.9
25-30	25	24.5
31-35	42	41.2
36-40	20	19.6
>40	13	12.9
Missing value	1	0.9
5. Teaching periods per week		
< 20	7	6.9
20-22	19	18.6
23-25	15	14.7
26-28	43	42.2
>28	17	16.7
Missing value	1	0.9

* Total N = 102

Va17); the standard deviations ranged from .52 (items Va18) to 1.09 (items Cu8). The mean scores were located within the expected range (none of the items are included a mean score of zero, at 95 % level of confidence, with a reliability of Alpha Cronbach = .68). The data showed that the dispersion of the scores for each item sufficiently discriminated the teachers' perceptions. In addition, the degree of bivariate correlation among most of the 18 items matrix variables ranged from low to high. However three of them (items Cu6, Cu7 and Cu8) were found to link weakly and negatively with the rest of the items.

To identify the factors that influence teachers' response toward teaching thinking, the data collected from the sample of 102 respondents were subjected to principal component analysis. Nevertheless, the present analysis used only the responses on the 15 of the 18 items (Table 3). Based on the results of

Table 2
Mean (Standard Deviation) and Item-Total Correlations of Teachers' Perception on Teaching Thinking

Items	Code	M	SD	r
1. Thinking can be best taught by identifying thinking skills and teaching them across the curriculum.	Ta1	4.18	.676	.352
2. A separate subject that teaches thinking skills should be introduced in schools.	Ta2	3.96	.842	.361
3. Students' thinking skills can be improved implicitly through my teaching methods.	Ta3	3.91	.590	.414
4. Students' thinking is developed when thinking are used as strategies in one or a few steps of the lesson development.	Ta4	4.08	.703	.369
5. The existing curriculum provides opportunities to teach thinking	Cu5	3.52	.982	.205
6. There is too much content in the syllabus that it does not allow the space for teaching thinking.	Cu6	3.92	.885	.108
7. The curriculum does not provide adequate guide on how thinking skills can be taught through a particular subject.	Cu7	3.79	.913	-.218
8. Focusing on developing students' thinking hinders the progress of a lesson.	Cu8	3.26	1.094	-.002
9. The school principal emphasizes teaching thinking skills as an important part of the school program.	Cu9	3.41	.977	.209
10. The textbook used helps in the teaching of thinking.	Cu10	3.53	.807	.334
11. I have adequate skills to develop students' thinking.	Ef11	3.26	.905	.373
12. I have adequate knowledge about teaching thinking.	Ef12	3.25	.938	.413
13. I feel competent in teaching my students how to think well.	Ef13	3.27	.932	.515
14. Through my teaching, I have attained the objectives of developing my students' thinking skills as intended.	Ef14	3.49	.794	.357
15. Teaching thinking skills is useful for students' success in activities outside of school.	Va15	4.26	.534	.236
16. Teaching thinking skills is important to help improve students' achievement.	Va16	4.42	.539	.439
17. Teaching thinking skills is relevant for work success.	Va17	4.53	.524	.414
18. Developing students' thinking skills helps to improve their moral reasoning.	Va18	4.43	.519	.416

item analysis as described in the preceding section, 3 of the items (items Cu6, Cu7 and Cu8) were excluded because they were behaving poorly in the item-total correlation.

Table 3 shows the correlations among the 15 items supported the use of principal component analysis. Specifically, the Bartlett Sphericity Test yielded statistically significant intercorrelation $\chi^2(102) = 659.72$, $p = .001$ with an overall MSA of .68, which exceeded the value of .60. Thus, the data matrix has sufficient correlation to justify the use of the exploratory factor analysis. The principal component analysis yielded a three –factor solution, representing 59.72% of the variance of the respondents' scores on the 15-variable scale.

The eigenvalues, ranging from 1.940 to 4.010 (which is greater than 1 as required), satisfied the standards of important factors as prescribed by Hair, et al. (2006).

Table 4 summarizes the result of the analysis, in which the Varimax with Kaiser normalization rotation was used to produce the final solution. The result of the exploratory factor analysis revealed that there were three latent variables measured by the data. The solution, extracted positive statistically

significant loadings, and free from factorial complexity and variable-specific factor which three factors loading = 59.72%.

Table 3
Correlation Matrix and Descriptive Statistic

	Ta1	Ta2	Ta3	Ta4	Cu5	Cu9	Cu10	Ef11	Ef12	Ef13	Ef14	Va15	Va16	Va17	Va18
Ta1	.655														
Ta2	-.395	.515													
Ta3	-.003	.174	.622												
Ta4	-.154	-.009	-.448	.669											
Cu5	-.009	.006	-.420	.162	.672										
Cu9	.145	-.306	-.204	-.004	-.006	.433									
Cu10	.000	.006	-.142	.001	-.004	-.431	.638								
Ef11	.004	-.005	-.118	.006	.154	.276	-.254	.627							
Ef12	.002	-.002	-.001	-.008	-.005	-.006	.108	-.819	.700						
Ef13	-.161	.125	.301	-.254	-.158	-.283	.144	-.316	-.005	.756					
Ef14	-.008	-.006	-.158	.138	.000	.005	-.006	-.128	-.001	-.227	.885				
Va15	.007	.002	-.005	.009	-.000	-.006	.006	-.199	.237	.008	-.009	.759			
Va16	.108	-.170	-.003	.001	-.107	.278	-.138	.315	-.225	-.253	-.006	-.406	.640		
Va17	-.000	-.146	-.107	-.006	.003	.003	-.003	-.009	.114	.005	.004	-.009	-.154	.881	
Va18	-.131	.123	-.004	.009	.004	-.175	.010	-.006	-.002	.003	.009	.001	-.659	-.206	.733
M	4.18	3.97	3.89	4.05	3.53	3.35	3.47	3.24	3.23	3.23	3.51	4.28	4.43	4.53	4.44
SD	.67	.84	.61	.72	.97	1.01	.86	.90	.93	.94	.79	.54	.54	.52	.52

Table 4
Varimax with Kaiser Normalization Rotated of Principal Component Analysis Factor Matrix

Variables	Factor1	Factor2	Factor3	Communality
Ef11	.940			.886
Ef12	.926			.864
Ef13	.802			.712
Ef14	.695			.518
Va15		.783		.625
Va16		.906		.853
Va17		.715		.565
Va18		.861		.773
Ta3			.784	.680
Ta4			.444	.483
Cu5			.597	.457
Cu9			.700	.591
Cu10			.695	.525

Table 5 shows that the first rotated factor, *the teachers' sense of efficacy*, has significant loadings, ranging between .695 and .940 on the same four items (Ef11, Ef12, Ef13, and Ef14) and Alpha Cronbach reliability = .88. Teachers' scores on this factor reflect their reaction on good organization of content and facilitators.

The second rotated factor includes four items (Va15, Va16, Va17, and Va18), ranging between .715 and .906, and Alpha Cronbach reliability = .84. Teachers' scores on this factor reflect their *value of teaching thinking*.

The third rotated factor comprises four items (Ta3, Ta4, Cu5, Cu9, Cu10), ranging between .444 and .784 and Alpha Cronbach reliability = .61. This factor can be described as the *structure of learning* which essentially is the teaching methods, curriculum, text books and support from the principals.

Table 5
Solution and Statistic from Principle Component Analysis according to Scale of Assessment of Teachers' Perception and Reliability of Items for Each Scale

Measures	No. of factors (items)	Communality	Factor loading	Prop of var. explained	Alpha coeff.
Self-efficacy	1(4)	.613-.894	.518-.880	23.60	.88
Value of teaching thinking	1(4)	.627-.851	.565-.853	45.67	.84
Structure of learning	1(5)	.594-.716	.457-.680	59.72	.61

Discussion

This study examined the factor that influenced teacher's perception on teaching thinking. Three factors were detected as the influencing factors in teaching thinking which were identified as (1) sense of efficacy (2) value of teaching thinking and (3) structure of learning.

The first two factors confirm the previous study of Rosnani and Suhailah (2003) that teachers' perception on teaching thinking was related to their sense of efficacy and value of teaching thinking. Although teachers may have differed in their sense of efficacy and value, the principal component analysis indicated that perceptions in teaching of thinking demanded a common sense of efficacy and value. Whereby, a good sense of efficacy and value which are related to teaching thinking should be promoted such as to that they would influence teachers' perceptions on teaching thinking.

Interestingly, this study has revealed that the latent factor which influences the teachers' perceptions on teaching thinking is the structure of learning. This concurs with Salem's (1995) and Tengku Shahroms' (1994) studies which show that teachers were influenced by educational methodology, text and extra-textual materials, and the educational setting which can be considered as the structure of learning.

Additionally, factors influencing teachers' perception on teaching thinking indicated the *internal factors* as teachers' sense of efficacy and value which play crucial roles. It can be said that those who are in charge of teaching thinking and have positive perception about the importance and enjoyment of it, can 'make' the teaching thinking effective. On the other hand, those who have negative perception may 'break' teaching thinking.

Moreover, this study illustrated that *the external factor* -the structure of learning- , which consists of teaching method, curriculum, textbooks and the support from the principals, also takes part in this process as well.

These results may reflect the study of Tengku Shahrom (1994) about the '*realities of implementation*' which pointed to both internal and external factors as indicators of the success or failure of the implementation of teaching thinking. Hence, to improve the quality of teaching thinking, it is recommended that (1) teachers are to believe in the teaching thinking by training them and developing a positive attitude and perception toward teaching thinking, and (2) the educational administration should provide in-service training of teaching thinking for teachers, providing support material and encouragement from principals.

Conclusions

This case study examined teachers' perceptions on teaching thinking. The three influencing factors were sense of efficacy, value of teaching thinking and structure of learning.

The findings of this study confirmed that teachers did perceive certain *internal context factors* (sense of efficacy and value of teaching thinking), and revealed that *external context factors* (structure of learning) also have an impact on their teaching thinking.

These findings are beneficial to understand and determine the success or failure of influencing factors and the implementation of teaching thinking as perceived by teachers. Furthermore, this study will aid teacher educators, administrators, and professional development coordinators to adequately prepare, train, and support teachers so they would become effective teachers in teaching thinking.

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