

Selecting the Strategies for Implementing Teacher Evaluation in Junior High Schools

Dian-Fu Chang^{1,a*} and Yu-Hsin Wang^{1,b,}

¹ Graduate Institute of Educational Policy and Leadership, Tamkang University

No. 151, Yingzhuang Rd., Tamsui Dist., New Taipei City 25137, Taiwan

^a140626@mail.tku.edu.tw, ^byu1749@ntpc.edu.tw,

*Corresponding author

Keywords: junior high school; teacher evaluation; fuzzy statistics.

Abstract. This study aims to select better strategies for implementing teacher evaluation in junior high schools. Based on the fuzzy questionnaire, this study collected the data from teachers' perceptions on importance and feasibility in related teacher evaluation strategies. The survey was targeted at 17 junior high school and 400 teachers in New Taipei city, Taiwan. The return rate of fuzzy questionnaires is 89.5%. This study transformed the interval data by way of fuzzy means, defuzzification, and fuzzy distance. The result reveals, for the purposes of teacher evaluation, the possible strategies are improving the quality of teaching and assisting teachers in their professional development; For the principles of teacher evaluation, the possible strategies including set the evaluation indicators according to teachers' teaching fields and let teachers participate in related decision making; For related methods of teacher evaluation, the possible strategies are classroom observation, using teacher self-evaluation, and using teaching portfolio. The inappropriate strategy is evaluated by parent questionnaires. The study suggests ten strategies for improving the current teacher evaluation system.

1. Research Background

Teachers are the main influence for education development and enhancing student learning. Better teachers' professional development has been considered as the key to improving the quality of education. Many studies revealed that implementing teacher evaluation through a reasonable way will help teachers' professional development and prompt to improve teachers' teaching quality [1]. Educational policy in many countries, like Europe and America, has viewed the "teacher evaluation" as an important tool for improving teacher quality and highlighted it as an important process for of teachers' professional development. In Taiwan, the Ministry of Education has initiated "Evaluation of Teachers' Professional Development Plan" in 2006. The main spirit of the plan is for teachers' better professional development. The purpose of plan is through peer interaction to promote teachers' professional competence and re-shaping the professional image of teachers [2]. In New Taipei City, implementing the plan is from 2006 to 2011, however the number of schools participating in the pilot is no more than six. Among 64 junior high schools, there are 7,100 teachers but only 86 teachers participated the teacher evaluation initiative plan

[3]. We can see that the progress of implementing teacher evaluation is quite slow. What happens in this city? Why some schools have participated in the pilot plan but drop in the coming year? Why implementing the plan is so muddling in those schools? It is worth further discussing in this study.

In this study, we tried to explore the issues from teachers' point of views. Then to develop suitable strategies to ameliorate the low participated in teacher evaluation program. To express the voice of teachers, we designed fuzzy questionnaire to collect data and applied fuzzy statistics to transform data and interpret the results. The findings will provide for related executive authorities to promote the teacher evaluation program. Given this purpose, this study will answer the following research questions. First, what are the teachers' views on the importance of teacher evaluation? Second, what are the teachers' views on the feasibility of teacher evaluation? Third, what is the difference between importance and feasibility of teacher evaluation perceived by teachers? Fourth, which strategies for teacher evaluation are suitable for junior high schools?

2. Literature Review

2.1 Teacher evaluation models

Teacher evaluation is a complex process, in order to achieve its intended purpose, we need to use diversified and appropriate evaluation methods. Based on the views of previous studies [1,4,6], the teacher evaluation includes teachers' self-regulated evaluation, peer evaluation, evaluated by administrative personnel, students evaluation, external evaluation, and evaluated by non-education members. As the data sources of teacher evaluation, there are three common evaluation methods named teacher interviews, classroom observations, and student performance.

2.2 Initiative teacher evaluation in Taiwan

Since 2006, the Ministry of education initiated the teachers' professional evaluation plan at all level of schools in Taiwan. The purposes of the initiative plan include improving the quality of education, maintaining the students' right of learning, and diminishing the unfair merit pay for teachers.

The Kaohsiung City took leading role to try out the teacher evaluation system, however, the Taipei City is promoted to implement teaching mentor system. In 2005, New Taipei City Government Bureau of Education (GBE) proposed the "Master teaching and upgrade profession" program for elementary and high schools. This pilot program emphasizes it is not given a grade for teachers' teaching quality, but rather for encouraging teachers' professional development. The evaluation was defined by three specific dimensions, namely teachers' planning capability, teaching and managerial competencies, and professional development capacity. None of the evaluation was rated in terms of marking by scores, nor was arranged by external assessment. If the teachers fail to pass the review, the GBE will provide an extra professional advisement. It is clear that the initiative program focuses on guidance rather than score-oriented [5,6]. The related evaluation models for teaching professional development have been raised [9], for example, the content of evaluation includes teachers' professional development, teaching practice and strategies, class management and learning climate, teacher in-service training and development, communication and cooperation, and teaching assessment and feedback.

2.3 The problems of implementing teacher evaluation

According to the statistics of Ministry of Education, there are 129 schools (17.4%) and 3,136 teachers (6%) participated in the pilot plan in 2010. The schools participated in the pilot plan has up to 166 in 2011[8]. Compared to the national wide data, the number of schools and teachers participated in the pilot plan has shrunken in New Taipei City [8]. Low participation has shown the potential problem in this city.

3. Methods

There are two main variables in this study, namely the importance and feasibility of implementing teacher evaluation, which include teachers' perceptions on the objectives of evaluation, principles of evaluation, methods of evaluation, applying the results of evaluation.

3.1 Sampling

The questionnaires were by mail, the teachers were sampled by stratified random method from 17 different size junior high schools in New Taipei City. The survey was conducted on December 29, 2011 and completed on January 13, 2012. The mailed questionnaires were 400 copies, the return rate was 89.5%, it was 358 validated questionnaires in this study.

This study asked the teachers to fill the questionnaire following their perceptions on the 16 evaluation related strategies. The teachers will view the importance of the strategies and then their feasibility. Each strategy is divided into 0~9 values to represent their importance and feasibility in this fuzzy scale. The bigger number indicates more importance and more feasibility. If the teacher answers importance of one of strategies, his/her range from 6~8, it means 6 is low bound and 8 is up bound of the interval data. The feasibility of the strategy, its range from 4~6 function the same way.

3.2 Data transform

This study used fuzzy statistics to transform the interval data in Excel 2010. According to various studies show that using fuzzy statistics to transform the data will reflect more accurate of ideas and provide more reasonable interpretation [9,10,11,12]. The following definitions and examples will present how the fuzzy means and fuzzy distance were used to transform the interval data [13] (see Definitions 1, Definition 2, and Definition 3).

Definition 1 Fuzzy mean (transform fuzzy interval data) [13,14]

Let U be the universal set and $\{Fx_i = [a_i, b_i], a_i, b_i \in R, i = 1, \dots, n\}$ be a sequence of random fuzzy samples on U . The fuzzy mean value is then defined as

$$F\bar{x} = \left[\frac{1}{n} \sum_{i=1}^n a_i, \frac{1}{n} \sum_{i=1}^n b_i \right] \quad (1)$$

Definition 2 Defuzzification for a fuzzy number on R [13,14]

Let $\chi = [a, b]$ ($a \neq b$) (be an interval fuzzy number on U). The defuzzification number R_χ of $[a, b]$ is then defined as

$$R_x = \frac{a + b}{2} + \left(1 - \frac{\ln(1 + |b - a|)}{|b - a|} \right) \quad (2)$$

Definition 3 Distance between triangle interval data set [13]

Let U be the universe of discourse. Let $\{\chi_i = (a, b, c), i = 1, 2, 3\}$ be three samples from U , with center $C_i = \frac{a_i + b_i + c_i}{3}$, $h_i = 1$, and area $A_i = \frac{(c_i - a_i) * h_i}{2}$, the distance

between the triangle samples χ_1 , and χ_2 (importance and feasibility) are defined as $\chi_1 \rightarrow [C_1, A_1]$, and $\chi_2 \rightarrow [C_2, A_2]$, then

$$d(\chi_1, \chi_2) = \left| C_i - C_j + \left| \frac{\ln(1 + |A_i|)}{|A_i|} - \frac{\ln(1 + |A_j|)}{|A_j|} \right| \right| \quad (3)$$

4. Results

4.1 The fuzzy distance of importance and feasibility of TE strategies

The result of transforming triangular fuzzy numbers to determine the distance of importance and feasibility has shown on Table 1. For the purposes of teacher evaluation, the results reveal that “to resolve incompetent teachers” has largest gap between importance and feasibility ($d=1.847$), followed by “assisting teachers’ professional development” ($d=1.278$), and “improve the quality of teaching” ($d=1.241$). For principles of teacher evaluation, teachers perceived that the “teachers participate in evaluation indicators decision making” has the largest gap between importance and feasibility ($d=1.058$), followed by “set the evaluation indicators as teachers’ professional development phase” ($d=0.986$), and then “set the evaluation indicators as teacher professional fields” ($d=0.973$). In Table 1, the mark # represents its defuzzification (R) less than average of theory

Table 1. The fuzzy distance of importance and feasibility of TE strategies perceived by teachers

Strategies		Importance Defuzzification (R_1)	Feasibility Defuzzification (R_2)	Fuzzy distance $d(R_1, R_2)$	Ranking of d	Total ranking of d
Purposes	*Assisting teachers’ professional development	6.61	5.33	1.278	2	2
	*Improve the quality of teaching	6.84	5.60	1.241	3	3
	*Decided to teachers’ annual performance appraisal	5.57	4.52	1.041	4	5
	*To resolve incompetent teachers	6.78	4.93	1.847	1	1
Principles	*Teachers participate in evaluation indicators decision making	7.11	6.05	1.058	1	4
	*Set the evaluation indicators as teacher professional fields	7.18	6.21	0.973	3	7
	*Set the evaluation indicators as teachers’ professional development phase	6.83	5.84	0.986	2	6
Methods	*Using teaching observation	6.68	5.96	0.714	1	10
	*Using teaching portfolio	5.47	5.84	0.367	3	13
	*Using teacher interview	6.07	5.65	0.421	2	12
	*Using students achievement	4.85	4.55	0.303	4	14
	*Using parent’s questionnaire	4.47 [#]	4.33 [#]	0.192	5	15
	*Using teachers self assessment	5.96	5.85	0.109	6	16
Using the results	*As the promotion pay for teachers	5.26	4.48 [#]	0.785	1	8
	*For renewal teachers	5.45	4.68	0.765	2	9
	*Guidance teachers professional development	6.52	5.87	0.648	3	11

For the methods of teacher evaluation, teachers’ perceptions on “using teaching observation” has revealed the larger gap between importance and feasibility ($d=0.714$), then “using teacher interview” ($d=0.421$), “using teaching portfolio” ($d=0.367$), “using students’ learning achievement” ($d=0.303$), “using parent’s questionnaire” ($d=0.192$), and finally “using teachers self assessment” ($d=0.109$).

For using the results of teacher evaluation, teachers’ perceptions also revealed that “as the promotion pay for teachers” ($d=0.785$) has larger gap between importance and feasibility, then “for renewal teachers” ($d=0.765$) and “guidance teachers professional development” ($d=0.648$).

Among these strategies, the largest fuzzy distance of importance and feasibility perceived by the teachers showed on “to resolve incompetent teachers”, “assisting teachers’ professional development”, and “improve the quality of teaching”. The strategies are so important but the teachers worried about their feasibility for implementing the teacher evaluation.

4.2 The results of strategies selection

According the analysis of fuzzy statistics, we listed the teachers’ strategies selection as their perceptions on very important and very feasible, important and feasible, important but unfeasible, unimportant and unfeasible. The results of strategies selection show on Table 2. We propose 10 useful strategies for better teacher evaluation in near future.

Table 2. The suggested strategies for teacher evaluation

	Strategies	Very important and very feasible	Important and feasible	Important but unfeasible	Unimportant and unfeasible	Suggested strategies
Purposes	*Assisting teachers’ professional development		✓			✓
	*Improve the quality of teaching		✓			✓
	*Decided to teachers’ annual performance appraisal			✓		
	*To resolve incompetent teachers			✓		
Principles	*Teachers participate in evaluation indicators decision making	✓				✓
	*Set the evaluation indicators as teacher professional fields	✓				✓
	*Set the evaluation indicators as teachers’ professional development phase		✓			✓
Methods	*Using teaching observation		✓			✓
	*Using teaching portfolio		✓			✓
	*Using teacher interview		✓			✓
	*Using students achievement				✓	
	*Using parent’s questionnaire				✓	
	*Using teachers self assessment		✓			✓
Using the results	*As the promotion pay for teachers			✓		
	*For renewal teachers			✓		
	*Guidance teachers professional development		✓			✓

5. Conclusion and suggestions

In this study, we found the teachers think the most important purposes of teacher evaluation are “improve the quality of teaching” and “assisting teachers professional development”, however, using teacher evaluation as a tool to “resolve the incompetent teacher problem” has been considered very important but low feasibility. Teachers reviewed the best principles of teacher evaluation are allowed teachers participate in evaluation indicators decision making, set the evaluation indicators as teacher professional fields, and set the evaluation indicators according to teachers’ professional development phase.

As we know, teaching in different areas may not be able to use the same evaluation methods. Therefore, we recommend the authorities empower teachers to discuss the related methods for their evaluation within schools. According to teachers’ perceptions, both using students’ achievement and using parent’s questionnaire as tools are unacceptable. The study found the evaluation result as the promotion pay for teachers or renewal teachers are unfeasible strategies. According to teachers’ perception on the strategies selection, we list the two very important and very feasible strategies and eight important and feasible strategies for better implement the teacher evaluation policy.

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