An Investigation of the Relationship between Professional Development and Teacher Efficacy

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Abstract. Teaching is regarded as a stressful and challenging job. This paper, based on Guskey’s professional development models and Bandura’s social cognitive theory, adopts close-ended survey questions to collect numeric data, investigates the association between teachers’ perceived effectiveness of professional activities and teacher self-efficacy, and finds that teaching experience level (notice vs. career) moderates the association between teachers’ perceptions of the effectiveness of PD and their level of self-efficacy, aiming at furthering understanding of the current state of primary school teachers regarding their PD effectiveness and efficacy.

Introduction

People working in the helping profession, such as teaching, medicine and social work, are usually subjected to emotional and physical overload and fall victim to stress and burnout. According to survey statistics, teaching is among the ‘high stress’ professions and approximately 25% of school teachers regard teaching as a ‘very or extremely stressful’ job when asked to rate their stress at work on questionnaires [1]. The current study aims to investigate the relationship between perceived effectiveness of professional development and teacher efficacy among teachers in Shanghai public primary schools.

Theoretical Framework

Two conceptual frameworks, Guskey’s [2] professional development models and Bandura’s [3] social cognitive theory, constitute the theoretical foundation of the current study. Perceived effectiveness of various professional development models serve as sources of teacher efficacy, which, in turn, may help account for variation in teacher stress.

According to Guskey, there are seven major models of professional development, namely, training, study groups, mentoring, observation/assessment, involvement in a development/improvement process, inquiry/action research, and individually guided activities.

Rooted in Bandura’s social cognitive theory, self-efficacy refers to individuals’ assessment about their ability to carry out a particular task and achieve desired performance. An extensive body of research claims that self-efficacy exerts critical influence on human behavior, which can be applicable to various settings, such as education, business, health and sports. According to Bandura, teachers’ self-efficacy plays a significant role in not only students’ achievement and outcome, but also teachers’ beliefs and instructional practice [4].

Bandura identified four major sources that self-efficacy derives from: mastery experiences, vicarious experiences, verbal persuasion, and physiological and emotional states. Mastery experience, regarded as the most powerful influence in self-efficacy, refers to an individual’s past experience with success at a task as building self-efficacy, while failure undermines the sense of self-efficacy. Vicarious experiences involve observing others succeed at a task, which may raise the belief that the observer could also succeed in performing the task. Social persuasion occurs when an individual is convinced or persuaded that he or she has the capabilities to be successful at a task. Physiological and emotional arousal also affects the sense of self-efficacy. When a person can reduce their stress reactions and alter negative tendencies in the face of adversity, their sense of
self-efficacy increases. Bandura claims that positive changes in self-efficacy are only the result from “compelling feedback that forcefully disrupts the preexisting disbelief in one’s capabilities”. Based on the theoretical framework and previous studies, the following research question (RQ) is adopted:

RQ: Is there a statistically significant relationship between teachers’ perception of effectiveness of professional development and the level of their self-efficacy after controlling for gender, discipline, grade level, teaching experience?

Research Design

A quantitative study is appropriate for the current study because the study adopts close-ended survey questions to collect numeric data, which are then statistically analyzed in order to answer specific research questions and test hypotheses [5]. The target population is full-time teachers in Shanghai public primary schools. A combination of convenience and cluster sampling strategies are employed in this study. First, Zhabei and Jiading districts are selected both because of easy access and because of their representativeness of the Shanghai population. According to the statistics issued by the Shanghai government[6], the average number of full-time in-service teachers per primary school in Shanghai is 65.61 and the teacher-student ratio in primary schools across Shanghai is 1:16. The two indicators for Zhabei and Jiading districts are 47.81, 1:14 and 65.69, 1:19 respectively; thus these two districts are fairly close to the Shanghai average.

Instrumentation

A total of three instruments are employed in this study, measuring teacher efficacy, participation and perceived effectiveness of professional development and demographic information respectively. First, Teacher Sense of Efficacy Scale (TSES) is adopted to measure teachers’ sense of efficacy. Second, a scale based on Guskey’s professional development model is designed to detect teachers’ participation in and perceived effectiveness of professional development. Third, a demographic survey is employed to collect data on teachers’ age, gender, teaching experience, discipline, and grade level taught.

Data Collection

This study adopts a web-based and self-reported questionnaire as the method for data collection because web-based surveys offer distinct advantages unavailable in traditional surveys [7]. First, online survey is more cost effective and environmentally friendly compared with traditional paper and pencil survey. Second, given easy access to internet and availability of computers, simple clicks of buttons save participants the trouble of sealing the envelope, going to the post office and mailing it. Third, instead of asking the teachers to finish the survey during the faculty meeting, which may raise concerns of coercion, especially with the principal present at the meeting, offering teachers an electronic link to the survey allows teachers more flexibility in doing the survey according to their own schedule and protects their privacy as some items regarding teacher stress might be sensitive.

Data Analysis

In the current study, Statistical Package for the Social Sciences (SPSS) 19.0 is employed to conduct all the statistical analysis. Descriptive statistics are computed to identify perceived effectiveness of professional development, the level of teacher efficacy and teacher stress. According to Carifio and Perla [8], it is “perfectly appropriate to calculate Pearson correlation coefficients using the summative ratings from Likert scales and to use these correlations as the basis for various multivariate analytical techniques”. Sequential regression is useful for estimating the unique proportion of variance in the outcome variable (e.g., teacher efficacy) that is explained by the influence variable (e.g., perceived effectiveness of professional development) beyond that accounted for by the control variables (e.g., gender, discipline and grade level).
Sampling

A total of 565 teachers responded to the online survey, among whom only one reported not participating in any of the seven types of professional development. Also, there were just two private school teachers, which is too small in number to be representative. Therefore, the sample size became 562 with these three cases removed to ensure a sample that reflects the target population that includes public primary school teachers in Shanghai who availed themselves of at least one type of professional development.

Regarding the demographic information, nearly 85% of the respondents are female, with only 15% male teachers. The proportion of teachers is generally evenly distributed across the five grades they teach, with approximately 16% to 22% of the teachers in grades one through five. As to their teaching experience, almost 84% are career teachers with more than three years of experience. Up to 81% teach core subjects, such as Chinese, math and English while only 19% serve as non-core subject (nature, music, PE and art) teachers, which reflects the fact that exam-oriented education is still prevailing in China, so core subjects are highly valued.

Results

Sequential multiple regression was employed to address the research question with the control variable (novice status) entering in the first block, followed by perceptions of PD effectiveness, then their cross-product.

Teaching experience accounted for 5.2% of the variance in teacher self-efficacy. After controlling for teaching experience, there is evidence to suggest teachers’ perceptions of the effectiveness of professional development is associated with their level of self-efficacy, accounting for an additional 7.9% of the variance in teacher self-efficacy, \( F(1,559)= 51.097, p < .001, \Delta R^2 = .079 \). As shown under Model 2 Coefficients within Table 1a, for each standard deviation increase in perceptions of PD effectiveness, there is a .283 standard deviation increase in teacher self-efficacy (\( b = .223, \beta = .283, p < .001 \)) after controlling for teacher experience. Novice teachers’ efficacy was lower than that of career teachers (\( b = -.364, \beta = -.255, p < .001 \)) after controlling for perceptions of PD effectiveness.

There is evidence to suggest teaching experience level (notice vs. career) moderates the association between teachers’ perceptions of the effectiveness of PD and their level of self-efficacy, with the cross-product accounting for an additional 2.1% of the variance in teacher efficacy \( F(1,558)= 14.140, p < .001, \Delta R^2 = .021 \).

Table 1. Sequential Multiple Regression Results Predicting Teacher Self-efficacy from Perceptions of PD Effectiveness, Testing Whether Teaching Experience (Novice Versus Career Teacher) Moderates the Association (\( n=562 \)).

<table>
<thead>
<tr>
<th>Block</th>
<th>Variables in the Models</th>
<th>( \Delta R^2 )</th>
<th>Model 2 Coefficients (all but variables from Block 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control Variables</td>
<td>.052***</td>
<td>B      SE(_B)      B  β    t</td>
</tr>
<tr>
<td></td>
<td>Novice Status (1=Yes, 0=No)</td>
<td></td>
<td>-.364  .057  -.255  -6.437***</td>
</tr>
<tr>
<td>2</td>
<td>Influence Variables</td>
<td>.079***</td>
<td>PD Effectiveness</td>
</tr>
<tr>
<td>3</td>
<td>Cross-products for Testing Moderation</td>
<td>.021***</td>
<td>Novice x PD Effectiveness</td>
</tr>
</tbody>
</table>

* p < .05   ** p < .01   *** p < .001

Note: Regression coefficients (B, \( \beta \)) their standard errors (SE\(_B\)) and the t-test of their statistical significance are from Model 2 (without the addition of the cross-product used to test for moderation).

Separate regressions by teaching experience level are summarized in Table 2. Specifically, among novice teachers, there is insufficient evidence of an association between perceptions of PD effectiveness and teacher self-efficacy (\( R^2 = .002, b = -.032, \beta = -.045, p = .670 \)). Among career
teachers, however, evidence suggests an association exists ($R^2 = .124$, $b = .276$, $\beta = .352$, $p < .001$). As perceptions of PD effectiveness rise, so do levels of teacher self-efficacy. Figure 1 illustrates how the association compares for novice versus career teachers. That the relationship is dissimilar across groups is apparent from the non-parallel regression lines, which are indicative of a moderating effect of teaching experience (novice versus career).

Table 2. Summary of Separate Regression Results Regarding Research Question #1 Predicting Teacher Self-efficacy from Perceptions of PD Effectiveness by Teaching Experience (Novice Versus Career Teacher).

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>$R^2$</th>
<th>$B$</th>
<th>$SE_B$</th>
<th>$B$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD Effectiveness for Novice Teachers</td>
<td>91</td>
<td>.002</td>
<td>-.032</td>
<td>.075</td>
<td>-.045</td>
<td>-0.427</td>
</tr>
<tr>
<td>PD Effectiveness for Career Teachers</td>
<td>471</td>
<td>.124</td>
<td>.276</td>
<td>.034</td>
<td>.352</td>
<td>8.146***</td>
</tr>
</tbody>
</table>

* $p < .05$  ** $p < .01$  *** $p < .001$

Figure 1. The Association between Teachers’ Perceptions of the Effectiveness of Professional Development in Which They Participated and Their Self-efficacy Moderated by Level of Teaching Experience. (Note that Those with at Most 3 Years of Teaching Experience are Considered to be Novices.)

Implications for Public Primary Schools

According to the findings of the study, implications for Chinese public primary schools are presented as follows. First of all, although teachers felt “quite a bit” of efficacy and generally believed in their capability, novice teachers display significantly lower efficacy compared with their career counterparts. Different from career teacher who have already accumulated rich teaching experience, new teachers lack mastery experience, the most powerful source of their self-efficacy. It is advisable that school administers pay attention to and invest more in other sources that contribute to new teachers’ self-efficacy, such as vicarious experience and verbal persuasion. Therefore, even without much experience in the teaching profession, novice teachers can still turn to relying on mentoring, observation of teaching, and study groups to enhance their efficacy.

According to novice teachers, they perceived PD activities to be “somewhat effective”, which indicates that it leaves much to be desired in either content design or mode of delivery. Novice teachers’ concerns and priority need to be better understood and taken into consideration when PD
programs are designed. Access to diverse PD activities, especially those focusing on the critical period of transition, classroom management, and teaching competence, would be valuable for new teachers and should be encouraged. Furthermore, when PD programs are provided, it is advisable that novice teachers enjoy some flexibility to choose individually appropriate type or combination of several different types which work best for them, instead of being assigned to compulsory participation of a particular type. Besides, novice teachers can also be involved in the designing process to work out novice teachers-tailored PD activities.

References