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## **Teacher effectiveness through Self-Efficacy, Collaboration and Principal Leadership**

### **1. Introduction**

School teachers influence and shape the thought process of children in their tender years (Knowles and Brown, 2000). In India, there is not only a shortage of teachers but there is also a dearth of quality (UNESCO report on Teachers and Educational Quality, 2006). With the 'Right to Education' being a fundamental right in the Constitution of India, it becomes essential to ensure quality education and teachers are one of the most important assets for this objective (Kaur and Singh, 2013; Pandey, 2006). Several studies have found teacher effectiveness to be directly contributing towards student achievement (Darling-Hammond, 2000; Heck, 2009; Sanders and Horn, 1998; Sanders and Rivers, 1996). However, the phenomenon of teacher effectiveness is complex and deserves further scrutiny (Cheng, 1996). Though studies in the western context have focused on 'what' comprises teacher effectiveness (Good, 1979; Mcber, 2000), studies examining the 'how' aspect of increasing teaching effectiveness are at best limited. In addition, studies examining teacher effectiveness relied on self-report measures of teacher effectiveness. The present study draws on Bandura's 'Self-efficacy' theory (1977) to explore whether teachers' belief in their ability, or teacher self-efficacy, is an important contributor to their effectiveness. The study uses student evaluations of teacher effectiveness to argue that self-efficacy has a significant influence on teacher effectiveness. It also explores how self-efficacy beliefs are formed among the teachers and whether the school leadership and peers have a role in self-efficacy beliefs of the teachers?

India provides a fertile research setting for the present study for three reasons. First, 29.5 percent of the country's population are under the age of 14 years (Census of India, 2011)<sup>1</sup> and education is considered as the key to India's growth and future (Rao et al., 2004).

In fact, studies have argued the urgent need to increase effectiveness of teachers in India (Sindhi and Shah, 2013). Second, the pupil to teacher ratio in India is 26, which is significantly higher than the developed countries like U.S. Hence teacher effectiveness is critical for the development of the society<sup>2</sup>. Third, studies outside the American context that have attempted to examine teacher effectiveness are scant (Azam and Kingdon, 2013). Therefore, it is necessary to understand the factors contributing towards teacher effectiveness in the Indian context.

### **Theory and Hypotheses**

Teacher effectiveness has been viewed through multiple lenses by various researchers. Becenti (2009) defined teacher effectiveness in terms of the ability to leverage research practices and implement the curriculum to enhance and sustain student performance. One factor that can be linked to teacher effectiveness is teacher self-efficacy. Coladarci and Breton (1997, p.230) note that “teacher self-efficacy is reflected by the teacher's confidence that he or she personally is capable of such instruction that one possesses personal agency with respect to the task of pedagogy”. Studies indicate that that ‘teacher-efficacy’ impacted student learning (e.g., Campbell et al., 2003). Teacher self-efficacy has been found to predict multiple cognitive, affective and behavioral responses (Skaalvik and Skaalvik, 2008), including protection from job strain and burnout (Shwarzer and Hallum, 2008); teacher’s job satisfaction, emotional exhaustion, engagement (Skaalvik and Skaalvik, 2014) and student performance (e.g. Ashton and Webb, 1986; Calik et al., 2012; Gibson and Dembo, 1984). In a longitudinal study, Holzberger et al. (2013) found cross-sectional correlations between self-efficacy and characteristics of instruction, and a causal effect of teacher’s self-efficacy on their instructional quality. At the same time there is a dearth of studies exploring teacher’s effectiveness from the perspective of the receivers, i.e., the students. Toland and De Ayala (2005) have defined teacher effectiveness through teacher’s delivery of course information,

teacher's role in facilitating teacher/student interactions and teacher's role in regulating students' learning. This study reasons that teacher self-efficacy is positively related with the three factors of teacher effectiveness.

*Hypothesis 1 (a): Teacher self-efficacy is positively associated with teacher's delivery of course information.*

*Hypothesis 1 (b): Teacher self-efficacy is positively associated with teacher's role in facilitating teacher/student interactions.*

*Hypothesis 1 (c): Teacher self-efficacy is positively associated to teacher's role in regulating students' learning.*

Raudenbush et al. (1992) note that teacher self-efficacy is a contextual rather than a global variable. Given this context specificity, two contextually relevant antecedents of teacher's self-efficacy namely, 'Collaboration' and 'Principal leadership' were studied.

Studies suggest that collaboration between teachers helps guard against uncertainty and challenges related to technical or instructional practice and also enhance teaching quality ( Jackson and Bruegmann, 2009; Mclaughlin and Talbert, 2006; Rosenholtz, 1989; Smith and Scott, 1990). Beatty (2000), found out that multi-disciplinary collaboration of secondary school teachers created changes in teachers' perceptions of themselves and their work. Leiberman (2000) suggests that teacher collaboration and networking helps in improving academic performance of the students. Conley et al. (2004), in their study with teacher work groups, found out that healthy interpersonal processes played a key role in improving teaching and learning. In a longitudinal study Jackson and Bruegmann (2009) concluded that when a teacher experiences improvements in observable characteristics of his/her colleagues, the students of that teacher get higher test score gains and teachers learn the most when they are the weakest in their peer group. Weathers (2009) noted that supportive leadership, shared values and vision, collective learning and application, supportive conditions-relational,

supportive conditions and shared personal practices impact satisfaction and morale of the teacher. In a recent study in Turkish middle schools, Duyar et al. (2013) found that some aspects of principal leadership and professional collaboration among teachers predicted teacher self-efficacy. Cognitive evaluation theory (Gagne and Deci, 2005) also suggests that positive feedback can positively influence a teacher's intrinsic motivation and his/her perception about his/her competence. Clearly, one of the sources of this feedback is the peer group. Hence, any positive feedback coming from peers is likely to alter the teacher's perception of her own competence. By contrast teachers working in isolation experience negative feelings about themselves (McGuire, 2011). Hence, it is posited that collaboration is positively related to teacher self-efficacy.

*Hypothesis 2: Collaboration is positively associated with teacher self-efficacy.*

The role of the school principal also assumes significance in enhancing self-efficacy beliefs. Barber and Meyerson (2007) noted that skilled school leaders engage with teachers to enhance performance of the school. Studies show that organizational culture is an important determinant of employees' self-efficacy (Ngang, 2011; Sheng, Pearson, and Crosby, 2003) and school leadership influences the school culture significantly (Leithwood, 2005). Blasé and Blasé (1999) studied the impact of everyday instructional leadership of principals on teachers and found that principal's suggestions have a positive impact on teachers' reflective behaviors, motivation, esteem, and sense of security. Hipp (1996) studied the relationship between principal's transformational leadership behavior and teachers' performance through detailed interviews. The study revealed that three of Leithwood's (1993) transformational leadership behaviors viz. modeling behavior, inspiring group purpose, and providing contingent rewards, were significantly related to general teaching efficacy. Walker and Slear (2011) also found that leadership behaviors were significantly related to teaching-efficacy.

Based on the above arguments it is hypothesized that,

*Hypothesis 3: Principal leadership is positively associated with teacher self-efficacy.*

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Insert Figure 1 here  
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## **2. Methodology**

The study adopted survey research. Established measurement scales were tested for face validity through a pilot study with students and teachers after which they were adopted for the study. It was found that students of sixth grade and above were able to comprehend the statements on their own, and did not face any major issues in understanding the language of the instructions and the items in the questionnaire. Hence, students of grade six and above were approached for participation in the final study.

For the main study, data were collected from 575 teachers and 6020 students from 25 private schools in Delhi (North India), Indore (Central India) and Gujarat (Western India). Survey research design was used to test the hypotheses. Though cross-sectional research design was adopted, the data was collected in two rounds, with a time gap of six months. In the first round, the participating teachers had taught students for eight months duration. In the second round, the teachers had taught students for two months duration. A mix of these ensured that data was not affected by the time teacher had taught the students. This ensured more generalizability in the results obtained.

Participation in the survey was completely voluntary. The primary researcher visited all the schools which had agreed to participate in the study, and collected the data in person through questionnaires. Data were collected from the teachers and the corresponding students

separately. To avoid any kind of influence, students were required to fill the questionnaire in the absence of their teachers and were explicitly informed about the anonymity of their responses. On an average, ten students filled the teacher effectiveness for each teacher, which is in line with existing norms where data for the predictor were collected from the supervisor and criterion data was taken from subordinates (Antonioni, 1994; Herold and Fields, 2004; London and Wohlers, 1991). After collecting the data, both the ratings were matched to conduct the analysis. One of the concerns in self-report measures is common method variances (CMV). To address that data were collected from multiple sources. Additionally, Herman's one factor test was conducted to check the possibility of CMV. Results showed that all the four factors explained a 66.779 percent variance whereas the first factor could explain a variance of 35.675 percent. Hence, CMV is not an issue in the present study.

Academic qualification, age and work experience have been found to be positively associated with teacher self-efficacy (Phipps et al., 2013; Shazadi et al., 2011). According to Darling-Hammond (2000), there is a significant and positive relationship between certification status and degree held by a teacher in the field to be taught, with student achievement. Rockoff (2004) also found that controlling for fixed teacher quality, teacher experience had significant positive effects on students' reading test scores. Clotfelter et al. (2007), demonstrated that teachers' experience was one of the three factors which had a positive effect on student achievement. Also, the antecedents of self-efficacy have been found to differ for novice and experienced teachers (Tschannen-Moran and Hoy, 2007). Bandura (1997) postulated four sources of teachers' sense of efficacy viz. enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological arousal. Mastery experiences are defined as a sense of satisfaction with one's past teaching successes

(Tschannen-Moran and Hoy, 2007). It can be argued that academic qualification and work experience can be expected to influence our hypotheses. Hence academic qualification, work experience and age were taken as control variables.

Perceived teacher effectiveness was captured using the 25 item version of 'Students' evaluation of teaching rating scale', developed by Toland and De Ayala (2005). Teacher self-efficacy was measured using the shortened version of 'Teachers' sense of efficacy' scale developed by Tschannen-Moran and Woolfolk-Hoy (2001) which has three dimensions namely, 'student engagement', 'instructional strategies' and 'classroom management'. An aggregate score of all the three components was used for final analysis. Principal's leadership was measured using the scale developed by Wylie and Hodgen (2010). Perceived teacher collaboration was measured using the "Teacher Collaboration Scale" developed by Goddard, Goddard and Tschannen-Moran (2007).

Composite reliability was examined since it is better suited than Cronbach's alpha as the latter tends to provide a severe underestimation of the internal consistency reliability of latent variables (Fornell & Larcker, 1981). The composite reliability values range from 0.909 to 0.974 providing strong evidence for measure reliability. Convergent and the discriminant validity were also examined (Campbell & Fiske, 1959). When the average variance extracted (AVE) has a value of at least 0.5 it demonstrates that a set of items can represent a single underlying construct, thus indicating construct validity (Fornell & Larcker, 1981). The AVE values in the models ranged from 0.600 to 0.754. Fornell and Larcker criterion was followed to check discriminant validity. It compares the correlations between the constructs with the square root of the AVE. All the variables indicated discriminant validity.

## **Results**

Data analysis was conducted using structural equation modeling (SEM) using the PLS. In contrast to regression that estimates only one proposed relation at a time, PLS enables

estimation of the simultaneous effect of multiple variables on dependent variable, on which kind of study the PLS analysis is preferred method (Hair et al., 2014).

Path weighting scheme with maximum of 300 iterations was selected. The data did not comprise any missing values. Bootstrapping, a nonparametric procedure, was done to test whether coefficients such as outer weights, outer loadings and path coefficients are significant by estimating standard errors for the estimates.  $R^2$  value is the most common measure for evaluating the structural model. The predictive accuracy of the model (Adj.  $R^2$ ) for the model linking principal leadership and collaboration to teacher's self-efficacy was found to be 27.60. In addition, the predictive relevance ( $q^2$ ) was found to be .163. The model has predictive relevance for a dependent variable if the  $q^2$  value for this dependent variable is greater than zero (Hair et al., 2014). The results found support for the model linking teacher self-efficacy to facets of teacher effectiveness with the acceptable level of predictive accuracy and predictive relevance (see Table 2).

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Insert Table 1 here

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Insert Table 2 here

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### 3. Discussion

Results suggested that teacher self-efficacy was positively associated with the two aspects of teacher effectiveness namely, Teacher's role in facilitating teacher/student

interactions and Teacher's role in regulating students' learning. Embedded in Bandura's 'Self-efficacy theory' (1977; 1986; 1989; 1997), is the idea that one's belief about oneself impacts behavior, actions, and subsequently one's performance. This is in congruence with previous studies which suggest that self-efficacy is positively related to work-related performance (e.g. Stajkovic and Luthans, 1998), and in particular with studies related to teaching context (e.g. Ashton, 1984; Henson, 2001). This is expected because self-efficacy influences a person's motivation levels (Maehr and Pintrich, 1997), expressed interest, task effort, persistence and level of goal setting (Gist, 1987). In short, it may be said that a teacher's persistence in terms of trying to improve his/her teaching performance and his/her belief that he/she can influence students' learning, makes him/her more effective. Findings from this study did not support the linkage between teacher self-efficacy and teacher's delivery of course information. . However, differential leniency effects in self reports can be expected and Borman (1991) found that on an average, supervisor and peer ratings were different from self-ratings. Hence, while collecting data from two different sources, helped in overcoming response biases, there is a possibility that it affected the strength of the relationship between the predictor and criterion variable. The results also indicate that collaboration among teachers is positively related to teacher self-efficacy. It is known from Bandura's 'Social Cognitive Theory' (1986; 1989; 1997) that three sources namely environmental influences, internal personal factors (cognitive, affective, and biological) and behavior influence a person's intentional pursuit of action. Collaboration and principal leadership are a part of these environmental influences which affect the teacher's beliefs about herself. Previous studies (Darling-Hammond, 1997; Raudenbusch, Rowan and Cheong, 1992; Shachar and Shmuelewitz, 1997) support the fact that collaboration among teachers leads to positive feelings about oneself. Fullan (1998) also reported that collaborative culture in schools creates an environment suitable for the emergence of professional learning

communities, which seek to continuously improve instructional practice and student achievement.

The analysis of data has also revealed a positive correlation between principal leadership and teacher self-efficacy. This strong relationship shows the important role played by the principal or leader in shaping the self-efficacy belief of a teacher. This is in consonance with previous studies (Hallinger, 2003; Marks and Printy, 2003; Walker and Slear, 2011) which suggest that, the principal of a school can impact the teachers' perceptions of the self. Findings from this study suggest that schools can enhance teacher effectiveness through self-efficacy beliefs, which in turn can be enhanced by providing an environment for collaboration among peers and support from the principal.

The study follows a cross-sectional design. To overcome this limitation, data has been collected at two different time points, with a gap of six months; yet, longitudinal data regarding value added by a teacher in terms of student learning has the possibility of increasing the scope of analysis. But the 'value-addition' approach raises issues regarding segregating the value added by the same teacher, and cumulative effects of other teachers and stakeholders like tutors, parents, peers etc. on student learning. Hence, a student may be not performing well in a particular subject at one point, and may feel that the teacher is ineffective. However, at a later point in time, with the help of a tutor or parents teaching at home, the same student may be able to grasp the content better in class and may feel that the same teacher who was ineffective earlier is effective now. Also, rather than taking teacher effectiveness data from only students as in this case, effectiveness ratings can also be corroborated by capturing data regarding teacher effectiveness from Heads of the Department, Principals and even parents. This may give a more holistic view regarding teacher effectiveness. There are however, constraints on availability of such data, especially in the Indian context. Moreover, even if available, most part of this data will be very

qualitative in nature for e.g. confidential reports of teachers, which may be hard to compare in absolute sense across different schools. A student's own level of intelligence, learning ability, parents' background etc. are also some of the factors that play an important role in forming his/her perceptions about the teacher. It is quite challenging to control for all these factors, but a large random sample of 6020 students, helps in overcoming interfering effects of this sort.

#### **4. Conclusion and Implications**

As indicated by the results of the study, collaboration among teachers and principal's leadership have the potential to positively influence teacher self-efficacy. From a theoretical perspective, this study contributes to the existing body of knowledge by establishing and confirming the relationship between teacher self-efficacy and teacher effectiveness, which is in consonance with previous studies (e.g., Ashton, 1984; Tschannen-Moran, Hoy and Hoy, 1998). The results of this study also confirm the role of collaboration and principal leadership in building teacher self-efficacy. Though earlier studies have shown that teacher self-efficacy impacts teacher effectiveness, not much research exists on "how" to enhance teacher self-efficacy. Results from this study indicate that teacher collaboration and principal's leadership are critical factors influencing teacher self-efficacy. The results grounded in the self-efficacy theory (Bandura, 1986) take the research on teacher effectiveness forward by identifying a positive association between teacher self-efficacy and three dimensions of teacher effectiveness viz. teacher's delivery of instruction, teacher's role in student/teacher interaction and regulating students' learning. Furthermore, this effect is demonstrated using student evaluations of teachers as against the more frequently used self-report data. The study indicates that if schools want to improve the effectiveness of their teachers, they need to focus on enhancing self-efficacy of their teachers and give importance to teacher collaboration and principal leadership.

It is important for schools to identify opportunities for collaboration among teachers and encourage it. Friend and Cook (2009) found that the biggest challenge that teachers face in terms of collaboration with peers is finding time to collaborate. Schools can dedicate specific time slots in regular schedules towards encouraging collaboration among their teachers and also rewarding them for the same. According to Friend (2000, p.1), “collaboration does not happen on its own through administrative mandate or peer pressure, but —requires commitment on the part of each individual to a shared goal, demands careful attention to communication skills, and obliges participants to maintain parity throughout their interaction”. Thus, it is important that teachers should also be convinced about the importance of collaboration, so that they take full interest in such activities. As can be seen gauged from the results of this study, role of the principal is also very important in enhancing self-efficacy of the teachers, and subsequently their effectiveness. The principal’s role in providing support through physical resources, motivation, goal-setting or sending teachers for training, gains importance for schools grappling with low teacher motivation and self-efficacy.

As discussed initially, the quality of teachers in the Indian education system is a matter of concern (Rajput and Walia, 1998). Given the importance of teachers in building the future of the nation, it is essential that all attempts are made to ensure that teachers are effective, and are able to influence student learning to the best possible extent. Results from the study show that if a teacher is high on self-efficacy, it positively influences his/her effectiveness in terms of delivery of instruction, interaction with students, and also regulating their learning. Thus, in order to enhance the effectiveness of a teacher, it is essential to pay attention towards building his/her self-efficacy. For a nation like India, where there is dearth of monetary resources and physical infrastructure at the school level, teacher collaboration

and principal leadership are two means of improving teacher effectiveness which do not require high monetary investment and yet create a huge impact of effectiveness of teachers.

This is first research study of its kind in India, which has attempted to capture teacher effectiveness through student ratings in terms of three different factors. In this sense, this study is also different from previous studies as it has gone beyond using student performance or teacher self-ratings which may not be an actual reflection of teacher's effectiveness. It is hoped that the results obtained from this study will aid schools in improving effectiveness of their teachers. Also, the importance of collaboration and principal leadership in shaping teacher self-efficacy, as indicated in this study, is likely to encourage schools to identify and develop opportunities and means for collaboration among teachers, with greater involvement from the principal leadership of the school leading to maximum student learning.

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#### Notes:

1. [http://www.censusindia.gov.in/vital\\_statistics/SRS\\_Report/9Chap%20%20-%202011.pdf](http://www.censusindia.gov.in/vital_statistics/SRS_Report/9Chap%20%20-%202011.pdf)
2. <http://data.worldbank.org/indicator/SE.SEC.ENRL.TC.ZS> accessed on 12 January, 2014.



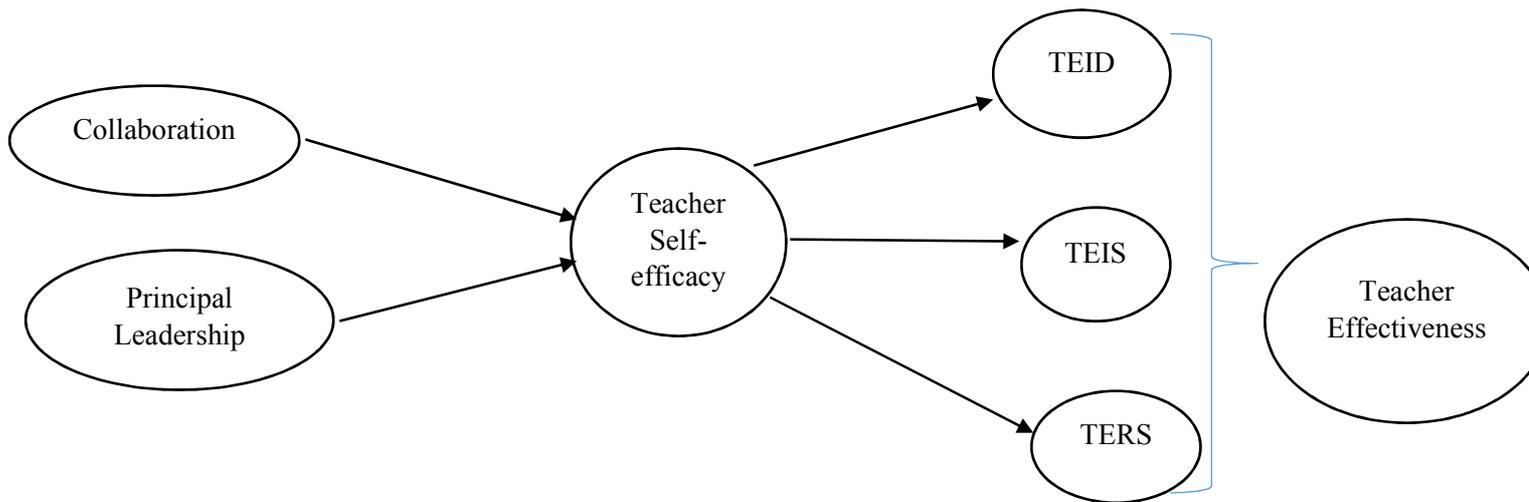


Figure 1. Model depicting relationship of Collaboration and Principal Leadership with Teacher Self-efficacy and that of Teacher Self-efficacy with Teacher Effectiveness.

Note: TEID: Teacher's delivery of course information.

TEIS: Teacher's role in facilitating teacher/student interactions.

TERS: Teacher's role in regulating students' learning.

**Table 1: Means, Standard Deviations, and Correlations among the Variables**

Sl. No.	Variables	Mean	SD	Alpha	CR	1	2	3	4	5	6	7	8	9
1.	Age	3.560	1.577			-								
2.	Qualification	2.020	.713			.062								
3.	Work experience	2.680	1.442			.830***	.088*							
4.	Collaboration	4.738	.899	.874	.909	-.004	.055	-.024	(.667)					
5.	Principal leadership	4.460	.599	.955	.960	-.031	-.048	-.053	.408***	(.600)				
6.	Teacher self-efficacy	7.750	.967	.939	.949	.069	.025	.037	.407***	.460***	(.608)			
7.	Delivery of course information	4.075	.425	.961	.974	.023	-.106**	-.002	.061	.109*	.080†	(.754)		
8.	Facilitating interaction	4.051	.430	.929	.966	.016	-.092*	-.003	.063	.102*	.091*	.916***	(.741)	
9.	Regulating students' learning	4.061	.402	.956	.968	.002	-.106**	-.017	.071†	.108*	.105*	.935***	.941***	(.718)

*Note:*

Sample size: 575 teachers and 6020 students

† $p < .1$  \*\* $p < .05$  \*\*\* $p < .001$

Numbers in the parenthesis in the diagonals represent the AVE scores.

SD: Standard deviation, Alpha: Cronbach alpha (measure of internal consistency).

CR: Composite reliability scores.

Table 2: Results of the predictors and outcomes of Teacher self-efficacy

	Path coefficients	T statistics		
<b>Control variables</b>				
Age -> Teacher self-efficacy	0.095	1.607		
Qualification -> Teacher self-efficacy	0.024	0.546		
Experience -> Teacher self-efficacy	-0.019	0.314		
<b>Direct effect</b>				
Collaboration -> Teacher self-efficacy	0.260***	6.079		
Principal Leadership -> Teacher self-efficacy	0.357***	7.136		
Note: Number of respondents: 575				
<b>Adjusted R<sup>2</sup> = 27.60, Q<sup>2</sup>=0.163;</b>				
<b>* p &lt; .05; ** p &lt; .01; *** p &lt; .001.</b>				
	Path coefficients	T statistics	Adjusted R <sup>2</sup>	Q <sup>2</sup>
Teacher self-efficacy -> Delivery of course information	0.080 ( <i>ns.</i> )	1.515		
Teacher self-efficacy -> Facilitation of interaction	0.091*	1.740	.008	.005
Teacher self-efficacy -> Regulation of students' learning	0.105**	2.428	.011	.007

Note: Number of respondents: 575 and 6020 students; \* p < .05; \*\* p < .01; \*\*\* p < .001.