

# Does Teacher Motivation Lead to Student Motivation?

## The Mediating Role of Teaching Behavior

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**Abstract.** The overarching purpose of this study is to investigate the impact of teacher motivation on teaching behavior and student motivation. The notion of teacher motivation refers to teachers' interests, self-efficacy, and mastery goals orientation. Teaching behavior comprises of mastery-oriented and cognitively activating instructional practices, however, student motivation represents students' interest in subject matter and student mastery-goals orientation. Data were collected from students (n=434) from pub-

lic sector elementary schools located in the Punjab province of Pakistan, where students were nested within teachers (n=89). Considering the multilevel nature of the data, multilevel analysis was used to test the hypothesized relationship between the constructs. The findings suggest that all facets of teacher motivation are antecedents of instructional practices as well as student motivation. Being a component of teaching behavior, instructional practices (only mastery-oriented) have strong positive links with student motivation suggesting that mastery oriented instructional practices involve a caring attitude towards students' interests and learning which in turn result in enhanced motivation among students. Moreover, beyond the direct positive association between teacher motivation and student motivation, mastery-oriented instructional practices also mediate the effect of teacher motivation.

**Keywords:** Teacher motivation, teaching behavior, instructional practices, student motivation, subject interest, teacher self-efficacy, mastery-orientation

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## 1. Introduction

Teacher motivation is receiving the widespread attention of educational researchers and practitioners because of its pronounced effects on teaching behaviors, academic achievements, student motivation, and stress. Teacher motivation acts as a crucial element necessary for optimal human performance in the workplace because highly motivated teachers appear to be more engaged in and satisfied with their work

than those with lower levels of motivation [Skaalvik, Skaalvik 2017a]. Considering this, scholars are devoting substantial amount of energy in understanding the concept itself, its underlying components, and its consequences [Fernet et al. 2008]. Though, there is an agreement that teacher motivation is a multidimensional construct [Butler 2007; Schiefele, Schaffner 2015], yet this stream of research demands further investigation to determine its unexplored components, facets, and/or outcomes. To this end, most scholars have endeavored to uncover its linkages with goal orientation (e. g. [Butler 2007]), self-efficacy (e. g. [Klassen et al. 2009]), enthusiasm (e. g. [Kunter et al. 2008]), teaching behavior (e. g., instructional practices), and occupational well-being (e. g., burnout). Some others (see e. g., [Fernet et al. 2008; Katz, Shahar 2015]), using self-determination theory (SDT) as an underlying mechanism to evaluate teacher motivation from self-determined and controlled motivation perspective, have studied its association with stress and their autonomy-supportive style.

Despite the existence of widespread literature on student motivation and interest, teacher motivation has not been paid that much attention besides deploying traditional motivation theories. The present study considers a nascent construct of '*teacher interests*' as a component of teacher motivation, thus ensuring rationale and edge over existing studies that either considered older constructs for teacher motivation or included only single/fewer dimensions for teacher motivation. Moreover, previous studies (see e. g., [Butler, Shibaz 2008; Retelsdorf et al. 2010; Skaalvik, Skaalvik 2007; Watt, Richardson 2008]) have focused on teachers' well-being (e. g., stress, burnout), and performance (e. g., job performance, goal achievement), while little attention has been paid to exploring the impact of teaching behavior (e. g., instructional practices) on student outcomes. Finally, past research carried out on teacher motivation across Pakistan revolves around either performance/job-related outcomes or occupational well-being, with the aspect of '*teaching behavior*' not succeeding to get any reasonable attention from educational researchers and practitioners.

This study proposes that the motivation levels of teachers roots from their interests in subjects, teaching approach, and overall educational methodology they adopt and practice. Teachers' orientation towards mastery goals and their belief in their own skills and competencies also catalyze their motivation level. Teaching and learning is an interactive process characterized by two-way communication (active interaction between and among teachers and students). In this way, teachers can influence students positively as well as negatively directly, and through teaching behavior.

This paper is organized as follows: The next section elaborates the theoretical background and hypotheses development followed by the methodology and results section. The last section covers discussion, conclusion, study implications, limitations, and future research directions.

**2. Theoretical background and hypotheses development**  
**2.1. Teacher motivation**

Teacher motivation refers to the energy, force, and/or desire that compels teachers to perform certain actions. This could also be the direction that leads teachers towards certain behaviors or repeating behaviors or keeping oneself away from specific behaviors [Elliot 2005]. Given that teachers are involved in multiple tasks which they have to accomplish, it seems very difficult to identify motivational processes underlying each task and their impact on the psychological functioning of teachers. Moreover, each work activity may possess a different underlying motivational process depending on its nature, and on the teacher performing that activity [Fernet et al. 2008]. Further, teacher motivation is a multidimensional concept, and has several facets and components. Therefore, the present study considers teachers' self-efficacy, mastery goals, and teachers' interests (relatively new construct proposed by Schiefele et al. [2013]) as components of teacher motivation. *Teacher interests* refer to the interests of teachers in a specific subject or knowledge domain that are relatively permanent attraction towards that domain based upon feelings and value related attributes [Hidi. Renninger 2006]. Subject interest, didactic interest, and educational interest are three dimensions of teacher interests [Schiefele et al. 2013]. Subject interest refers to teachers' interest in subject and its contents being taught (e. g., Physics, Mathematic) as well as broader aspects and concepts relevant to the subject matter. Didactic interest refers to teaching methodology of the subject matter and the preparation of teaching contents. Educational interest encompasses occupational and pedagogical aspects necessary for the teaching profession. Teacher interest is an important component of teacher motivation that functions as an antecedent for teachers' occupational well-being, teaching behaviors, instructional practices and student motivation, which in turn contribute to high academic performance in both teachers and students.

*Teacher Self-efficacy* refers to teachers' belief in his or her own capability to perform a certain task or set of activities [Bandura 1986]. A self-efficacious teacher is, thus, one who possesses strong beliefs that he or she can positively influence the students and their learning. In education, self-efficacy helps students in achieving better performance, challenging goals which in turn enhance their motivation. For teachers, it provides strong feelings regarding positively influencing students learning, better job performance, high job commitments, more work engagement, teaching behaviors, and instructional practices [Schiefele, Schaffner 2015]. Teachers with a relatively lower level of self-efficacy encounter occupational problems such as student misbehavior, burnout, stress, job dissatisfaction, and are found to be pessimistic regarding student learning and academic achievement [Skaalvik, Skaalvik 2017b].

*Teacher Mastery goals orientation* refers to teachers' thirst for mastery skills to seek extended expertise for mastery skills development [Elliot 2005]. Self-determination theory (SDT) suggests that

mastery-goals oriented teachers seek to improve their performance relative to their previous outcomes or according to task demands. Students perceive mastery-oriented teachers helpful in the learning process, friendly when asking them questions, and supportive when seeking help [Butler, Shibaz 2008]. Contrary to mastery goals, teachers focusing on achievement oriented goals strive to increase their competitive performance. Moreover, teachers with mastery-goals orientation are found to emphasize competence gaining and strive to adopt 'mastery-oriented' and 'cognitively activating' instructional practices [Retelsdorf et al. 2010]. Drawing upon achievement goal theory, individuals adopt either performance goals or mastery goals depending upon their perception regarding competence and likelihood of success [Papaioannou, Christodoulidis 2007]. Individuals aimed at performance goals strive to exhibit their competence based upon comparison to others. They make efforts to outperform to show their social superiority over others through their performance.

**2.2. Teaching behavior—  
instructional practices** Instructional practices are a dimension of teaching behavior where teachers focus on the adaption of certain policies and procedures in their classroom activities which aim at achieving specific classroom/student outcomes [Wolters, Daugherty 2007]. These practices include mastery-oriented, performance-oriented, and cognitively-activating practices [Retelsdorf et al. 2010]. This study considers two types of instructional practices (mastery-oriented and cognitively activating) to explore their antecedents and outcomes. *Mastery-oriented* instructional practices refer to the teacher's efforts, attempts, and exertions on tasks and activities of students' interests in order to enhance their skills and abilities, evaluating students' performance relative to their past progress, and considering students' errors as an opportunity for learning [Meece, Anderman, Anderman 2006]. *Cognitively-activating* instructional practices refer to the teachers' efforts to provide students with a challenging task, coming up with unusual solutions to problems, independent thinking, critical thinking, and embracing fresh ideas [Retelsdorf et al. 2010].

**2.3. Student motivation** Student motivation refers to the energy, force, and/or desire that compel students to perform certain actions. This could also be the direction that leads students towards certain behaviors or repeating the behaviors or keeping them away from specific behaviors [Elliot, 2005]. Student motivation functions as a key to their academic performance and achievement [Zee et al. 2016]. Past studies show that less motivated students were found to engage in more negative behaviors and emotions and less class participation resulting in poor academic performance [Urhahne 2015]. Furthermore, student motivation levels are also associated with the teachers' perception of interaction and involvement with students in such a way that teachers who perceived students as motivated helped those students to increase their aca-

ademic performance. This study conceptualizes student motivation as student subject interest and student mastery-goals orientation.

#### 2.4. Relationship between teacher motivation and student motivation

Teacher motivation is measured on the basis of three components-teacher interest, teacher self-efficacy and teacher mastery-goal orientation. Association of each component with student motivation is discussed separately:

##### 2.4.1. Teacher interest and student motivation

Teacher interest is an important factor that may provide the foundation to not only encourage teachers towards teaching but also help them to motivate their students. According to theories of interest, interests work as components that are important in explaining relevant outcomes [Hidi et al. 2006]. For example, the study by Hidi et al. [2006] and Schiefele et al. [2013] considered interest as a component of motivation in a student context. These studies proposed student interest as an important factor playing its role in the promotion of educational outcomes. Likewise, theories of interest provide solid grounds to be studied from the teachers' perspective [Watt et al. 2008]. Teacher interests are an individual's interests in a specific subject or knowledge domain that are a relatively permanent attraction of the individual towards that domain based upon feelings and value related attributes [Hidi et al. 2006]. Simply put, teacher interest is the perception of individuals being positively attached and attracted towards a particular subject domain. Teacher interest has three components; subject interest, didactic interest and educational interest. Each component of teacher interest focuses on particular aspects of subject matter, teaching content, teaching methods and educational issues in the profession. *Teacher interest* helps in propagating values, enhancing social competencies, and facilitates dealing with challenging student and class situations [Hulleman et al. 2010]. Drawing from theories of interest, teacher interest has the potential to positively influence and enhance teacher level outcomes as well as that of the student. Therefore, teacher interest is more likely to play a vital role in defining and promoting motivation among students of those teachers who are found highly interested in their subject domain, didactic and educational aspects. On the basis of the discussions above it is proposed that the teacher interest component of teacher motivation is positively associated with student motivation in such a way that an increase in the level of teacher interest causes a significant rise in student motivation.

*H1 a:* There is significant association between teacher interest and student motivation.

##### 2.4.2. Teacher self-efficacy and student motivation

Self-efficacy refers to the one's belief that one has the capability to perform a certain task or set of activities [Bandura 1986]. A self-efficacious teacher is one who possesses strong beliefs that he/she

can positively influence the students and the learning of the students. Self-efficacy is a crucial element for better individual performance in a variety of settings such as health, education, organization, sports, and work [Klassen et al. 2009]. In education, the self-efficacy of students helps them to challenge goals and achieve better performance and motivation [Schiefele et al. 2015; Skaalvik et al. 2007]. Teachers with a relatively lower level of self-efficacy encounter occupational problems such as student misbehavior, and are found to be pessimistic regarding their students' learning and academic achievement [Caprara, Barbaranelli, Steca, Malone 2006]. More recent studies such as that of de Boer et al. [2016], and Wang et al. [2015], demonstrated that self-efficacious teachers serve as a source of encouragement and student engagement, along with playing important role to motivate their students. On the basis of the discussions above, teacher self-efficacy is proposed as an important predictor of student motivation.

*H1 b*: There is significant association between teacher self-efficacy and student motivation.

#### 2.4.3. Teacher mastery goal orientation and student motivation

Mastery goal orientation refers to one's interest in a task or activity for enhancing one's skills and getting oneself mastered in work activities. According to achievement goal theory, individuals adopt either performance goals or mastery goals depending on their perception regarding competence and likelihood of success. Mastery oriented individuals make an effort to get themselves mastered in particular tasks or set of activities rather than to outperform or to show their social superiority over others through their performance. Mastery oriented teachers have a thirst for mastery skills which motivates them to seek extended expertise for mastery skills development which in turn accelerates student motivation [Elliot 2005]. Because mastery-goals oriented teachers seek to improve their performance relative to their previous outcomes or according to task demands, students perceive mastery-orientated teachers helpful in the learning process, friendly when asking questions, and supportive when seeking help [Butler et al. 2008]. Based upon the above stated discussions, teacher mastery-goal orientation fosters motivation among students.

*H1 c*: There is significant association between teacher mastery-goal orientation and student motivation.

#### 2.4.4. Teacher motivation and instructional practices

Teacher motivation has been viewed as a direct and indirect predictor of teaching behavior and occupational wellbeing [Klusmann et al. 2008]. Recent evidence (e.g., [Schiefele et al. 2013]) indicates that teacher interest is an antecedent of mastery-oriented practices. Teachers having a higher degree of subject and didactic interest are more likely to apply various teaching methods to ensure enhanced learning and improved student academic performance. The study of

Ross [1998], reported that the self-efficacy component of teacher motivation has a positive association with various types of instructional practices and is open to accepting new methods of teaching. In education, self-efficacy of students helps them to challenge goals and achieve better performance and motivation; for teachers, it provides strong feelings of positively influencing students learning, and instructional practices [Schiefele et al. 2015; Skaalvik et al. 2007]. Mastery-oriented instructional practices derived from teacher motivation help to continuously improve and develop abilities among students. Han et al. [2015] empirically confirmed a positive association between goal-orientation and teacher behavior. He found that mastery-oriented goals are positively linked with attitude towards teaching. More specifically, the findings of Retelsdorf et al. [2010] show that teachers' mastery-goal orientation is positively linked with mastery-oriented as well as cognitively activating practices. Considering the above discussion, we hypothesized that all three components of teacher motivation have a positive relationship with instructional practices.

*Hypothesis 2:* There is a significant association between teacher motivation (teacher interests, self-efficacy, and mastery goals) and instructional practices.

#### 2.4.5. Instructional practices and student motivation

Teachers' instructional behavior is an integral factor for engaging students in the learning process [Pressley et al. 2001]. Mastery-oriented practices help to continuously improve and develop the abilities and skills of students which in turn serve as a source of motivation [Retelsdorf et al. 2010]. On the other hand, cognitively activating instructional practices provide students with challenging tasks and encourage finding unusual solutions to problems, independent thinking, and embracing fresh ideas, thus provoking the urge to perform well in crucial situations. The study of Zee et al. [2016] provides support for instructional strategies and their effect on student level variables. Similarly, Park et al. [2016], and Urhahne [2015] reported empirical support for the causal relationship between instructional practices and student motivation. Based on the discussions above, it is argued that instructional practices are positively linked with student motivation.

*Hypothesis 3:* Instructional practices have positive links with student motivation.

*Hypothesis 4:* Instructional practices mediate the positive effect of teacher motivation on student motivation.

### 3. Methodology

#### 3.1 Research design

The present study involves the analysis of a survey questionnaire in order to test the hypotheses. The study setting is public sector elementary schools in the province of Punjab, Pakistan. Elementary school is proven to be the place where children learn to make or break their fu-

ture. Hence, this period could not be more helpful for acknowledging the different aspects of teacher and student motivation in teaching and learning. During adolescence, teachers can influence their students in many ways such as forming peer relations, achieving identity in occupation, gender roles, politics and religious maturity [Woolfolk, Hoy, McCune-Nicolich 1980]. All these aspects provide a basis for the grooming of students and eventually form what they would become in the future. Therefore, this study setting provides the most appropriate unit of analysis. The study considers multilevel data where students are treated as level 1 that are nested within their respective teachers who are being treated as level 2. The rationale behind taking data at a multilevel is to identify whether the level of student motivation varies across teacher level motivation and instructional practices. Treating data at the same level would not provide any insight into shared variance which is contributed by level 2 variables to level 1 variables. Thus, multilevel data allows for studying the possible effects of teacher motivation and instructional practices on student motivation considering that student motivation is not uniform across their teacher level [Downer et al. 2015].

### 3.2. Sample and data collection

A total of 679 questionnaires were distributed, out of which 97 questionnaires were distributed to elementary school teachers and 582 to their students. There were six students nested within each teacher. The list of elementary schools was drawn from the website of the School Education Department, Government of the Punjab. Once the schools were selected, the researcher visited each school personally and asked for the consent of teachers for their participation. Those teachers who showed a willingness to provide responses plus six of his/her students were selected through convenient sampling. All six students belonged to the same class of the teacher concerned.

For the teachers, out of 97, 93 participants responded. Four questionnaires were incomplete, and thus unusable for the study. The responses of the students of these four teachers were also excluded to avoid any likelihood of response bias and/or misleading results. For the students, 582 questionnaires were distributed out of which 462 (79.3%) were received. Besides 24 excluded responses of non-respondent students, four questionnaires were incomplete and two were unfilled. Eventually, 434 questionnaires from students were completed from all aspects and useable for further analysis.

### 3.3. Construct Measurement

Teacher motivation was measured on the basis of three components: teacher interest, teacher self-efficacy, and teacher mastery-goals orientation. Teacher interest was assessed by means of the Teacher Interest Scale (TIS) developed by Schiefele, Streblov, and Retelsdorf [2013]. This scale consisted of fourteen items out of which five items were related to subject interest, 4 to didactic interest and 5 were related to educational interest. Teachers' self-efficacy was measured using a nine-item scale developed by Schwarzer, Schmitz, and Day-



Table 1: Mean, Standard Deviation, Correlation and Cronbach's Alpha of Level-2 Variables

	Mean	SD	1	2	3	4	5	6	7	8
Age	3.67	0.765	—							
Gender	1.360	0.483	0.167	—						
Experience	3.438	1.651	-0.371**	0.071	—					
Teacher Interest	4.404	0.432	-0.175	-0.190	0.007	<b>0.854</b>				
Teacher Mastery-Goals Orientation	4.356	0.487	-0.102	-0.148	-0.055	0.531**	<b>0.838</b>			
Teacher Self-Efficacy	4.135	0.540	-0.128	-0.217*	-0.090	0.588**	0.338**	<b>0.825</b>		
Mastery-Oriented Practices	4.329	0.553	-0.160	-0.384**	-0.029	0.469**	0.502**	0.472**	<b>0.771</b>	
Cognitively Activating Practices	3.791	0.658	-0.015	0.125	-0.007	0.381**	0.171	0.503**	0.197	<b>0.855</b>

Note: \*  $p > 0.05$ ; \*\*  $p > 0.01$ .  $N = 89$ .

tner [1999]. Teacher mastery-goals orientation was measured using a three-item scale developed by Elliot and McGregor [2001].

Instructional practices were measured through two components as cognitively activating practices and mastery-oriented practices. To measure cognitively activating practices, a six-item scale was taken from the project Professional Competence of Teachers, Cognitively Activating Instruction, and the Development of Students' Mathematical Literacy (COACTIV; as adapted by Kunter et al. [2007]). The assessment of teacher mastery-oriented practices was based on the Pattern of Adaptive Learning Scales (PALS; [Midgley et al. 2000]). This scale consisted of four items. Student motivation was measured on the basis of students' subject interest and mastery goals orientation. The same scales, as used for teachers, were used, however, the statements were modified with respect to the students. All of the items were measured on a 5-point likert scale.

#### 4. Analysis and results

##### 4.1. Descriptive and reliability statistics

Since all the scales used to collect data were pre-developed and validated, we therefore moved directly to analysis. Table 1 presents Mean, Standard Deviation, Correlation and Cronbach's Alpha of level-2 variables. Column one provides demographics and a description of level-2 variables. Column two is about the mean score of each variable. Column three is related to the standard deviation of all the variables. The values of Cronbach's Alpha are given on the diagonal in bold.

Table 2, below, presents the means and standard deviations of variables, and correlations for the dependent variable.

Table 2: Mean, Standard Deviation, Correlation and Cronbach's Alpha of Level-1 Variables

	Mean	SD	1	2	3	4
1. Gender	1.29	0.454	—			
2. Age	7.12	0.787	0.248**	—		
3. Student Subject Interest	4.439	0.449	-0.112*	-0.115*	<b>0.819</b>	
4. Student Mastery-Goals Orientation	4.285	0.435	-0.103	0.211*	0.641**	<b>0.843</b>

Note: \*  $p > 0.05$ ; \*\*  $p > 0.01$ .  $N = 434$

#### 4.2. Hypotheses testing

Mplus 7 was used to test multilevel direct and indirect relationships. There are a few important things that must be considered before conducting multilevel analysis. First, a Chi-Square test of significance was used to determine if there is variance in level-1 outcome variable(s) by level-2 variable(s). If the Chi-Square test is statistically significant, it provides solid grounds to perform multilevel modeling. Second, Inter Class Correlation Coefficient ( $ICC_1$ ) must be computed before moving towards analysis. ICC represents the amount of variance in student motivation contributed by teacher level variables. Finally, Inter Rater Reliability ( $ICC_2$ ) may also be computed. It is an index of within group consistency also known as inters rater reliability [Chen, Mathieu, Bliese 2005]. The value of  $ICC_2$  is suggested to be equal or greater than 0.70 [Nunnally, Bernstein 1994]. For the study, the value of Chi-Square  $\chi^2(88) = 148.52$ ,  $p < 0.001$  suggests that group level variables cause a variance in individual level variable which implies that teacher motivation and instructional practices have a significant contribution to the level of student motivation.  $ICC_1$  for the model is 0.2238 which shows that 22.38% variance in student motivation is because of teacher motivation and instructional practices. A detailed examination suggested that teachers-level determinants accounted for 27.37% and 19.61% variance in student subject interest and student mastery-goals orientation, respectively. The value of  $ICC_2$  for teacher motivation is 0.89 which suggests that responses for teacher motivation are consistent among all the teachers. The  $ICC_2$  value for instructional practices is 0.68 which is below 0.70 which means that the teachers' responses for instructional practices are less consistent, thus not supporting within level consistency. A detailed analysis of  $ICC_2$  shows that the value of  $ICC_2$  for mastery-oriented practices meet the criteria ( $ICC_2=0.77$ ) but cognitively activating practices did not meet the criteria ( $ICC_2=0.65$ ). These statistics suggest that there is a cross level relationship between teacher motivation (as a whole) and between instructional practices (in parts, only for mastery-oriented practices) and student motivation. However, we still keep cognitively activating practices at group level. Following the procedure suggested

Table 3: **Multilevel analysis result for direct effects**

Level and variables	Student Motivation					
	Student Subject Interest			Student Mastery-Goals Orientation		
	1	2	3	1	2	3
Level-1						
Student Gender	-0.007	-0.012	-0.010	0.001	0.00	-0.007
Student Age	0.002	0.002	0.002	0.003	0.003	0.002
$R^2$	0.00	0.00	0.00	0.00	0.00	0.00
Level-2						
Teacher Gender	-0.062	-0.103†	-0.109*	-0.091	-0.146†	-0.082*
Teacher Age	0.003	0.003	0.004	-0.005	-0.004	0.003
Teacher Self-efficacy		0.168*	0.045*		0.083*	0.034*
Teacher interest		0.123**	0.095**		0.182**	0.071**
Teacher mastery-goal orientation		0.245**	0.190**		0.363**	0.143**
Cognitively activating instructional practices			0.031†			0.027
Mastery-oriented instructional practices			0.144*			0.208*
$R^2$	0.026	0.431**	0.493**	0.023	0.269*	0.372**
$\Delta R^2$	0.026	0.405**	0.062*	0.023	0.246**	0.103**

Note: \*  $p > 0.05$ ; \*\*  $p > 0.01$ .  $N = 434$ .

by Preecher and Hayes [2013], a 2–2–1 multilevel mediation was performed using Mplus 7 software. At first, only direct relationships were examined, keeping student motivation (student subject interest, student mastery-goals orientation) as a first-level dependent variable and teacher motivation (teacher interest, self-efficacy, mastery-goals) and instructional practices (mastery-oriented practices and cognitively activating practices) as level-two independent variables. All variables were entered together.

The results showed that all three components of teacher motivation are positively linked with student motivation. Among the three elements, the strongest relationship was between mastery goal orientation and student subject interest ( $\beta = 0.245$ ,  $p < 0.01$ ), while the weakest was between teacher interest and student subject interest ( $\beta = 0.123$ ,  $p < 0.01$ ). As for the association between the three components of teacher motivation and student mastery-goal orientation, the strongest relationship was between teacher mastery goal orientation and student mastery goal orientation ( $\beta = 0.363$ ,  $p < 0.01$ ), whereas

Table 4: **Multilevel mediation results**

	Indirect effect	95% CI [lower CI, upper CI]
TSE → MOP → SSI	0.064*	[0.005, 0.018]
TI → MOP → SSI	0.071*	[0.001, 0.154]
TMO → MOP → SSI	0.067*	[0.008, 0.182]
TSE → MOP → SMGO	0.082*	[0.010, 0.201]
TI → MOP → SMGO	0.093*	[0.009, 0.194]
TMO → MOP → SMGO	0.083**	[0.017, 0.389]

Note: \*\* $p < 0.01$ ; \* $p < 0.05$ ;

TSE = Teacher Self-efficacy; TI = Teacher interest; TMO = Teacher mastery-goal orientation; CAP = Cognitively activating instructional practices; MOP = Mastery-oriented instructional practices; SSI = Student subject interest; SMGO = Student mastery-goals orientation

teacher self-efficacy has the weakest association with student mastery goal orientation ( $\beta = 0.083$ ,  $p < 0.05$ ). The results of instructional practices suggested its partial relationship with student motivation where only mastery-oriented instructional practices have a positive influence on student motivation i. e. student subject interest ( $\beta = 0.144$ ,  $p < 0.01$ ) and mastery-goals orientation ( $\beta = 0.208$ ,  $p < 0.01$ ). Therefore, all the hypotheses on direct relationships are supported. The values of  $\Delta R^2$  suggest the presence of mediation. Besides the traditional Sobel [1982] test of significance, bootstrapping was also used to test the significance of indirect effect. In bootstrapping upper and lower confidence intervals (CIs) are used to judge if effect lies within the significance region. Table 4 presents the results of mediation.

The results suggest a positive partial mediational effect of teacher self-efficacy, mastery-goals orientation, and teacher interest for student subject interest is  $\beta = 0.064$ ,  $p < 0.05$ ,  $\beta = 0.067$ ,  $p < 0.05$ , and  $\beta = 0.071$ ,  $p < 0.05$  respectively, and for student mastery-goals orientation is  $\beta = 0.082$ ,  $p < 0.05$ ,  $\beta = 0.083$ ,  $p < 0.01$ , and  $\beta = 0.093$ ,  $p < 0.05$  respectively. Thus, hypothesis 4 was partially supported.

## 5. Discussions and implications

The results of this study suggest that teacher motivation is a strong antecedent of student motivation. These results are consistent with the findings of Schiefele and Schaffner [2015], and Santisi et al. [2014]. Findings advocate that teacher motivation provides a strong foundation to teachers for motivation and helps them to meet emerging job demands and the expectations of students and society and also help them to influence their students' motivation level. As a result, highly motivated students are more likely to perform much better than those

less motivated, thus where teacher motivation is high, students are also highly motivated and produce improved academic performance. Teachers may increase their motivation through increased level of subject, didactic and/or educational interests. A more self-efficacious teacher is more confident regarding his/her belief in the subject matter he/she teaches than those with a low level of self-efficacy. Self-efficacy of teachers is an important factor that contributes to their motivation. Similarly, goal orientation (of particular, Mastery-goal orientation) helps teachers set their goals, which in turn serve as source of motivation. A mastery-goal oriented teacher focuses on his/her professional improvement and tries to perform better than his/her prior performance. Students get inspiration from teachers who strive for their professional improvement rather than those who try to make their performance superior to others.

The findings of this study provide significant support for the effect of teacher motivation on instructional practices  $b = 0.763$ ,  $p < 0.001$ . These results are similar to the findings of Wolters and Daugherty [2007], Retelsdorf et al. [2010], and Butler [2012]. The data fails to reject the null hypothesis of no association between the above two variables. Thus, this study accepts a significant positive relationship between teacher motivation and instructional practices. The results from multilevel modeling analysis provided evidence for only one component of instructional practices i. e. mastery-oriented practices. Cognitively activating practices were not found to have any significant effect on student motivation. This result is consistent with the study of Schiefele and Schafner [2015]. In their study, cognitively activating practices were measured at both level-1 and level-2 but neither of the cognitively activating practices were found to be significant with student subject interests. The data only supported mastery-oriented practices hence a partial association of instructional practices with teacher motivation is found. The result is similar to that of Park et al. [2016].

In light of the findings of the study the following suggestions are offered to elementary school teachers in particular and all teachers in general. First, as teacher interest is found to be an important component of teacher motivation, teachers should develop their interest in a relative subject domain. Second, administration should focus on right sizing so that a teacher may get chance to teach the subject he/she is more interested in. Third, teachers must enhance their self-efficacy by indulging themselves in those academic activities which may flourish their professional competencies. Fourth, capacity building of teachers should be the priority in school education sector reforms. Finally, curricular activities must be feasible and according to the nature of the students as the child is the center of the entire educational process.

**6. Conclusion** On the basis of the statistical analyses and empirical results, the following conclusions are drawn: Teacher motivation is an important predic-

tor of student motivation. Teachers with high levels of motivation (characterized by teacher interest, self-efficacy, and mastery-goals orientation) play a vital role in fostering motivation among students. It is an essential factor for elementary school teachers to ensure optimal performance which in turn enhances work engagement and satisfaction. Similarly, teacher motivation is also positively linked with instructional practices, indicating that a highly motivated teacher is more likely to adopt such instructional practices that focus either on student improvement of the subject matter or coping with challenging situations. Mastery-oriented instructional practices have a positive link with student motivation which implies that elementary school teachers are highly encouraged to adopt such practices that foster interest, enhance skills and improve the learning process among students. However, the data did not support the causal association between cognitively activating practices and student motivation, implying that elementary school students are not comfortable and/or welcoming towards challenging tasks and critically acclaimed activities. Therefore, cognitively activating practices do not serve as a source of motivation to students.

## **7. Limitations and future directions**

Although the study has several contributions towards literature and has several implications for practitioners, there are some limitations that restrict the scope and generalizability of the findings. First, this study is cross sectional in nature and the data was collected over a single point in time, therefore it does not provide any variance in the motivation levels of teachers and students from one time point to another. Second, the targeted population of the study consisted of elementary schools only. This restricts the generalizability of the study at national and/or regional level. Third, only subject interest was taken as measure of student motivation, which also restricts our understanding into a single context and does not give any insight into other aspects of student motivation. Fourth, the data on instructional practices are based on the information from teachers' self-reports rather than on the basis of expert observations in the classroom, thus increasing the likelihood of biased responses because teachers are influenced by various classroom and contextual factors. Considering these limitations, future studies could be longitudinal in nature rather than cross sectional. Student motivation may also be measured using parameters of extrinsic motivation e. g. rewards and/ or awards by teachers and/or schools. In addition to that, future research should also control for the potential effect of student academic achievement, which this study didn't do, because previous studies suggest strong ties between students' academic achievements and motivation. Since the sample of students who reported their motivation was not randomized, there may be some shifts which may lead to the fact that a more motivated (more interested in the subject, with higher self-efficacy) teachers are represented by more successful students. There-

fore, they demonstrate a higher level of motivation. Besides students' academic achievement, future studies should also consider the socio-economic status of students and schools, as these attributes can also influence the level of student motivation. Further, teacher motivation can also be studied in context with student wellbeing such as stress, burn out etc. Finally, the population of the study may spread across more than one district or province of Pakistan. Moreover, a comparative study may prove fruitful in providing an insight into teacher and student motivation in different geographic/ cultural areas.

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