

## Path Analysis of the Effects of Teaching Attitudes and Anxiety on Pre-Service Teachers' Efficacy Beliefs

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**Abstract:** The current study examined two hypothesized models in which teachers' efficacy beliefs are predicted by teaching attitudes and teaching anxiety. Attitudes and anxiety, as predictors, interchanged the role of being exogenous variable in the two suggested models. Data from 329 pre-service teachers showed moderate relationships among the three variables with the strongest relationship reported between teaching anxiety and efficacy beliefs. Path analysis showed support for the model in which teaching attitude was the predictor of both anxiety and efficacy beliefs. The study results emphasized the need for paying attention to the nature of applied experiences the pre-service teachers get during university years and the importance of careful design of preparation teacher programs. Further studies should investigate the model through intervention and longitudinal researches.

**Key words:** Teachers' efficacy beliefs % Teaching attitudes % Teaching anxiety % Path analysis % Pre-service teachers

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### INTRODUCTION

Teachers' efficacy beliefs refer to teachers' beliefs about their ability to positively influence students [1]. Previous research shows teachers' efficacy beliefs as a determining factor in teacher competence, associated with productive teaching practices and high student achievement [1, 2]. Teachers' efficacy beliefs are found to correlate with teachers' attitude toward teaching [3], use of technology in instructions [4], teaching commitment [5], attitudes towards school reform and innovation [6], performance [7], instructional strategies [8], persistence, risk-taking [9, 10], goal setting [9] and students' achievement, success and performance [9, 11, 12].

Bandura [1] proposes that teachers' efficacy beliefs develop through four venues that are considered to be the source for efficacy beliefs. These are: enactive experiences, vicarious experience, social persuasion and physiological and affective status. Across all four sources, what influence efficacy beliefs are not merely the events related to each source, rather it is how these events are perceived. First, enactive experiences represent

actual experiences that an individual teacher accumulates through direct experience with teaching events. If these events are successful, efficacy beliefs are enhanced and if these events are unsuccessful, efficacy beliefs are more likely to be harmed.

Vicarious experience represents an individual teacher's perception of other people's success and failure and it may influence the individual's perception of his/her teaching efficacy. Bandura states, "people seek proficient models who possess the competencies to which they aspire" [1, p. 73]. Social persuasion represents another important source of efficacy beliefs especially in the first years of teaching and during teacher preparation programs. Bandura [1] contends that when teachers are persuaded that they have the capabilities to master teaching activities they are more likely to show greater effort and be motivated to influence the learning of their students. Previous research shows that teachers, especially novice, are influenced by their colleagues and administrative social support [13]. The influence of these four sources depends on teachers' interpretations of information received from these sources.

**The Study Path Model: Examining Precedents of Efficacy**

**Beliefs:** From a cognitive-relational stress theory, Jerusalem and Mittag [14] argue that for better psychological adaptation to new circumstances, both personal and environmental resources are needed for effective coping strategies, higher self-efficacy beliefs and well-being. This is consistent with a model of teachers' efficacy beliefs introduced by Tschannen-Moran *et al.* [2]. In a context where teachers' efficacy beliefs are established, high efficacious teachers trust their own capabilities to handle different teaching demands [14]. Teachers are more likely to view these demands and teaching problems as challenges rather than threats; attribute success to effort and failure to external conditions; and face stressful teaching conditions with high confidence and motivation. In such situations, teachers' high efficacy beliefs function as buffer against arousing anxiety experiences and foster positive attitudes towards teaching and students. Previous research on in-service teachers shows that teachers' levels of efficacy beliefs influenced their teaching performance and instructional strategies [15]. Well-established efficacy beliefs play a major role in keeping those teachers as effective classroom teachers [16].

In a context where these efficacy beliefs are not yet well established, teachers are apt to develop negative attitudes towards teaching, anxiety arousal, threat assessments of events, self-doubts and perceptions of coping deficiencies whenever they deal with difficult students or demanding teaching situations. Bandura [1] contends that teachers' efficacy beliefs are more malleable in the first early years of teaching. This is true particularly for pre-service and beginning teachers. Those novice teachers may lack the required mastery experiences that promote high sense of efficacy beliefs; they may not get the needed support from cooperating teachers and they may not be provided with the essential teaching resources. Very significant to the current study are the affective processes that teachers go through during their teacher education programs. The importance of these processes appears in the teachers' coping abilities to control sources of stress and burnout. If teachers lack such processes, they are more likely to develop anxiety and burnout when faced with threats [1]. Previous research found that positive feedback from supervisors, friends and colleagues increased novice teachers' feeling of efficacy [17].

We argue in our proposed model that pre-service teachers' efficacy beliefs can be affected by taking into account the levels of teaching anxiety that these teachers

go through during their teaching practicum and their attitudes toward teaching. Theoretical considerations and empirical findings suggest that these constructs would be significantly connected.

Teaching anxiety can be defined as "a teacher's psychological and physiological state about teaching characterized by cognitive, somatic, emotional and behavioral components [18, p. 2]. Previous research shows that anxiety relates to teachers' personal, social and physical characteristics (e.g., burnout, feeling of teaching inadequacy, teaching experiences) [19] as well as students' anxiety experiences [20]. Teaching anxiety was found to relate negatively to in-service teachers' sense of efficacy beliefs [18]. The same findings are supported by research outside the area of teaching. Self-efficacy beliefs were found to relate to anxiety with college students [21].

Attitudes toward teaching represent teachers' feeling about teaching processes. [18, p. 2] define teaching attitude as, "a function of the individual's belief value matrix and as evolving from perceptions that attitude objects might block or facilitate need satisfaction." Attitudes influence teachers' beliefs to teach effectively [22]. Previous research shows that teachers' efficacy beliefs are influenced by mediating variables such as teaching attitudes and attributions (23, 24, 25, as cited in Lancaster and Bain [26]).

Years in teacher preparation programs that provide experiential components of teaching are found to foster positive attitudes toward teaching [26, p. 247-248]. Indeed, students start to form their attitudes towards teaching even before finishing their high schools. Previous research documents the influence of preparation programs in pre-service and novice teachers' efficacy beliefs [27]. Yost [10] found that pre-service successful field and teaching experiences increased teachers' sense of efficacy beliefs during their first year of teaching. Similarly, Bruce *et al.* [9] found teachers' efficacy beliefs to be enhanced through vicarious learning experiences. The researchers showed the effects of observing peers teaching, having opportunities to share concerns and discussing classroom practices with colleagues [9]. In addition, interventions were found to influence teachers' attitudes [16].

It is evident from previous research that teachers' efficacy belief is positively related to teaching attitudes and negatively to teaching anxiety [22, 21, 28]. Positive teaching attitude is negatively related to teaching anxiety [22]. However, it is not clear yet from available research whether attitudes can precede anxiety or vice versa when it comes to their influence on teachers' efficacy beliefs.

The current study deals with this issue by examining two models the first of which deals with teaching anxiety as a mediator in the relationship between teaching attitudes and efficacy beliefs while the second treats attitudes as a mediator in the relationship between teaching anxiety and efficacy beliefs. The current study looks also at possible differences in the study variables (teaching attitudes, anxiety and efficacy beliefs) that can be attributed to the participants' gender and study programs.

The study aims to answer the following questions:

- C What are the levels of pre-service teachers' teaching attitudes, teaching efficacy beliefs and teaching anxiety? Are there differences based on students' gender and study programs?
- C What are the causal path relationships among teaching attitudes, teaching efficacy beliefs and teaching anxiety?

## MATERIAL AND METHODS

**Participants and Procedures:** The participants were 329 pre-service teachers (undergraduate students) enrolled on teaching practicum course at the College of Education at Sultan Qaboos University in the Sultanate of Oman at the beginning of Fall 2009. This course is the first time students experience real teaching with school students. The students spend one whole day per week on their assigned schools for 15 weeks. The students are required to teach between 2-4 sessions as well as engage in day-to-day duties of a typical school teacher such as grading, supervising school activities and others. The sample consisted of 129 males and 200 females. The students were at the beginning of their final year of their study programs. The participants represented various academic study programs at the College of Education including: Arabic Language ( $N=27$ ), English Language ( $N=106$ ), Science Education ( $N=58$ ), Mathematics Education ( $N=31$ ), Physical Education ( $N=34$ ), Social Studies ( $N=20$ ) and Instructional Technologies ( $N=35$ ). The remaining participants ( $N=18$ ) did not reveal their study programs. The variation in the sample size among different study programs represents the actual number of students enrolled at the college of Education.

Students who wished to participate were given a self-report questionnaire containing four sections: demographic information, teaching attitude, teaching efficacy beliefs and teaching anxiety. The questionnaire was distributed to the participants during the meeting

between the students and the coordinators of the teaching practice for each study major. The administration of the questionnaire took about 10-15 minutes.

**Instrument:** The instrument used was a four-page self-report questionnaire with demographic information including gender and study program as well as three sections. The instrument was subjected to a content validation process done by four professors in the area of educational measurement and psychology at Sultan Qaboos University. The professors were asked to judge the clarity of wording and appropriateness of each statement for the use with the targeted participants and its relevance to the constructs being measured. Their feedback was used for refinement of the items. The description of the four sections of the questionnaire is given below.

**Teaching Efficacy Beliefs:** The second section contained fifteen statements assessing participants' teaching efficacy beliefs. These items were taken from the Teacher Sense of Efficacy Scale (TSES) developed by Tschannen-Moran and Woolfolk Hoy [13] and adapted for Arabic participants. Previous research reported high and adequate reliability and validity indicators for the TSES across different cultures [29]. The TSES assesses participants' perceptions of efficacy beliefs in various teaching skills including efficacy for instructions, classroom management and students' engagement. The participants responded to each statement using a 9-point Likert scale ranging from 1 (*most unable*) to 9 (*most able*). Scores can range from 15 to 135. Then the average of the fifteen statements was computed in order to get each participant's teaching efficacy beliefs. This scale showed a high reliability coefficient which was 0.914 as estimated by Cronbach alpha coefficient. The TSES fifteen items were subjected to principal-components factor analysis to determine whether they represented a single construct. The results showed that they yielded a single factor with an eigenvalue of 6.84 and the unifactor solution accounted for 45.58% of the total variance. All items loaded between 0.67 and 0.73 with a mean of 0.67 on the factor. The results supported previous research factorial examination of the TSES [13].

**Teaching Attitude:** The third section contained eight statements assessing participants' teaching attitude as a profession. Four statements were phrased positively while the other four statements were phrased negatively to represent the two sides of teaching attitude.

The participants responded to each statement using a 9-point Likert scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*). The negative statements were reversely recorded and then the average of the eight statements was computed in order to get the intensity of each participant's teaching attitude. This section showed a high reliability coefficient which was 0.84 as estimated by Cronbach alpha coefficient. A principal-components factor analysis was conducted on these eight items to determine whether they represented a single construct of teaching attitude. This analysis yielded a single factor with an eigenvalue of 3.96 and the unifactor solution accounted for 49.55% of the total variance. All items loaded between 0.30 and 0.90 with a mean of 0.67 on the factor.

**Teaching Anxiety:** The last section of the instrument contained fourteen statements assessing participants' teaching anxiety. The Teaching Anxiety Scale (TCHAS) was originally constructed by Parsons [31], adapted into Arabic by Shuaib [31 and modified for Omani pre-service [32, 33]. Previous research reported adequate reliability and validity evidences. The TCHAS aims to assess participants' self-reporting of their feelings and tensions while they are teaching. The participants responded to each statement using a 5-point Likert scale for the frequency of experiencing certain anxiety behaviors ranging from 1 (*never*) to 5 (*always*). The TCHAS contained ten positive statements (revealing restless behaviors), while the remaining four statements were negatively-phrased statements (revealing comfortable behaviors). The responses to the four negatively-phrased statements were reversed and added to other statements to obtain the average of all fourteen statements in order to get each participant's level of teaching anxiety. This TCHAS showed a high reliability coefficient which was 0.81 as estimated by Cronbach alpha coefficient. The fourteen items for the teaching anxiety were subjected to principal-components factor analysis to determine whether they represented a single construct. These items yielded a single factor with an eigenvalue of 4.20 and the unifactor solution accounted for 30% of the total variance. All items loaded between 0.27 and 0.72 with a mean of 0.53 on the factor. A similar single-factor structure was found by other studies [32, 30].

**Data Analysis:** The data were entered in the statistical analysis program (PASW (SPSS) v17) and analyzed using descriptive statistics, Pearson's correlation and

multivariate analysis of variance. In addition, the relationships among the three characteristics of pre-service teachers were tested through hypothesizing a model depicting the causal relationships among teaching attitude, teaching anxiety and teaching efficacy beliefs. In this model, the following hypothesized paths were tested to determine if (a) teaching attitude has a direct effect on teaching Efficacy beliefs, (b) teaching anxiety has a direct effect on teaching Efficacy beliefs, (c) teaching anxiety mediates the effect of teaching attitude on teaching Efficacy beliefs (d) teaching attitude mediates the effect of teaching anxiety on teaching Efficacy beliefs. Both models consist of one exogenous variable and two endogenous variables. For Model 1, the exogenous variable is teaching attitude, whereas the endogenous variables are teaching anxiety and teaching Efficacy beliefs. However, for Model 2, the exogenous variable is teaching anxiety, whereas the endogenous variables are teaching attitude and teaching Efficacy beliefs.

The model was estimated using the covariance structure in LISREL 8.52 [34]. Since the fit of the covariance structure model to data is 1, the evaluation of the two models was based on *t* tests of specific path coefficients and the squared multiple correlation of the models to determine whether each of the hypothesized relationships had been confirmed. Prior to the path analysis, the variables were screened for outliers and normality. There was no concern about deviation from normality.

## RESULTS AND DISCUSSION

**Descriptive and Group Differences:** Results showed that, on average, the participants reported relatively high teaching Efficacy beliefs level ( $M=7.14$ ,  $SD=1.58$ ) and medium teaching attitude ( $M=5.70$ ,  $SD=0.93$ ). Moreover, the participants reported low level of teaching anxiety ( $M=2.21$ ,  $SD=0.51$ ). Next, the level of these three constructs was examined with pre-service teachers from various study majors. The multivariate analysis of variance showed an overall significant difference on the three constructs among the seven study programs (Wilks' lambda=0.89,  $F_{18,792}=1.91$ ,  $p=0.013$ ). Table 1 presents the follow-up one-way ANOVA for each construct by the study programs. As seen in Table 2, there were no statistical differences among the seven study programs on teaching attitude, teaching anxiety and teaching Efficacy beliefs.

Table 1: Follow-up one-way ANOVA for the three pre-service teachers' dependent variables by the study programs

Dependent	Independent	SS	df	MS	F	P-value
TT	Study program	27.99	6	4.67	1.83	0.094
	Error	7.55	282	2.56		
TEB	Study program	7.55	6	2.56	1.54	0.165
	Error	230.62	282	1.26		
TAX	Study program	1.09	6	0.10	0.71	0.640
	Error	72.43	282	0.26		

TT = teaching towards teaching, TEB=teaching Efficacy beliefs, TAX=teaching anxiety

Table 2: Follow-up one-way ANOVA for the three pre-service teachers' dependent variables by gender

Dependent Variables	Males	Females	df1	df2	F	P-value
TT	5.31	5.95	1	305	13.02	0.00
TEB	7.22	7.09	1	305	0.36	0.55
TAX	2.20	2.22	1	305	0.09	0.76

TT = teaching attitude, TEB=teaching Efficacy beliefs, TAX=teaching anxiety

Table 3: Pearson product-moment correlation for the three dependent variables

Variables	TT	TEB
TT	-	
TEB	0.307 *	-
TAX	-0.257 *	-.540 *

TT = teaching attitude, TEB=teaching efficacy beliefs, TAX=teaching anxiety

\* $p < 0.001$

Table 4: Effects and their t-test for various paths in the two models

Model	Cause	Effect	Direct Effect	Indirect Effect	Total Effect
Model 1	TAX	TEB	-0.49 (10.17)		-0.49 (10.17)
	TT	TEB	0.18 (3.71)	0.13 (4.24)	0.31 (5.66)
	TT	TAX	-0.26 (4.67)	-	-0.26 (4.67)
Model 2	TAX	TEB	-0.49 (10.17)	-0.05 (2.90)	-0.54 (11.26)
	TT	TEB	0.18 (3.71)		0.18 (3.71)
	TAX	TT	-0.26 (4.67)	-	-0.26 (4.67)

TT = teaching attitude, TEB=teaching efficacy beliefs, TAX=teaching anxiety

Values in parenthesis are t-test value.

In addition, the multivariate analysis of variance showed that the pre-service male teachers differed significantly from the pre-service female teachers on the overall effect of the three constructs (Wilks' lambda=0.95,  $F_{3,303}=5.63$ ,  $p=0.001$ ). The follow-up ANOVA analysis, in Table 2, revealed that the males and females pre-service teachers differed significantly only on their teaching attitude. Female pre-service teachers ( $M=5.95$ ) had better teaching attitude than their male counterparts ( $M=5.31$ ).

**Relationships:** An investigation of the Pearson correlations, shown in Table 3, displayed intercorrelations pattern among the three constructs that is consistent with previous research and theories [18]. Teaching attitude was positively correlated with teaching Efficacy beliefs. This reveals that the pre-service teachers who have a high positive teaching attitude tend to show high teaching Efficacy beliefs. Moreover, teaching anxiety had negative

correlations with both teaching attitude and teaching Efficacy beliefs. This indicates that pre-service teachers who are anxious about teaching demonstrate a negative teaching attitude and have most probably low teaching Efficacy beliefs.

**Path Analysis:** Table 4 displays results of the two path analysis models of teaching attitude, teaching anxiety and teaching Efficacy beliefs. With Model 1 where teaching attitude was the exogenous variable, there was a statistically significant negative direct effect of teaching attitude on teaching anxiety ( $\beta = -0.26$ ,  $t = 4.67$ ) and a positive direct effect on teaching Efficacy beliefs ( $\beta = 0.18$ ,  $t = 3.71$ ), indicating that manipulating instruction and activities in teacher preparation programs that foster teaching attitude tends to reduce teaching anxiety and improve teaching Efficacy beliefs. At the same time, teaching attitude has an indirect effect on teaching

Efficacy beliefs through teaching anxiety. This indirect effect is about the same as its corresponding direct effect ( $\beta = 0.13, t = 4.24$ ). In addition, as predicted, teaching anxiety has a statistically significant negative direct effect on teaching Efficacy beliefs ( $\beta = -0.49, t = 10.17$ ), suggesting that preservice teachers with a low teaching anxiety tends to have high teaching Efficacy beliefs. This model suggests that the total effect on teaching Efficacy beliefs was -0.49 which resulted from manipulating teaching anxiety and 0.31 which resulted from manipulating teaching attitude.

In contrast, with Model 2 where teaching anxiety was the exogenous variable, there was a statistically significant negative direct effect of teaching anxiety on both teaching attitude ( $\beta = -0.26, t = 4.67$ ) and teaching Efficacy beliefs ( $\beta = -0.49, t = 10.17$ ), indicating that manipulating instruction and activities in teacher preparation programs such as micro teaching that reduce teaching anxiety tends to foster high levels of teaching attitude and teaching Efficacy beliefs. At the same time, teaching anxiety has an indirect effect on teaching Efficacy beliefs through teaching attitude. However, this indirect effect is much weaker than its corresponding direct effect ( $\beta = -0.05, t = 2.90$ ). In addition, as predicted, teaching attitude has a statistically significant positive direct effect on teaching Efficacy beliefs ( $\beta = 0.18, t = 3.71$ ), suggesting that preservice teachers with a high teaching attitude tends to have high teaching Efficacy beliefs. In summary, this model suggests that the total effect on teaching Efficacy beliefs was -0.54 which resulted from manipulating teaching anxiety and 0.18 which resulted from manipulating teaching attitude.

In summary, comparison between the two models revealed that Model 1 showed stronger total effects on teaching Efficacy beliefs which resulted from both teaching attitude and teaching anxiety.

## CONCLUSION

Pre-service teachers at beginning of teaching practice showed high teaching Efficacy beliefs, moderate attitude toward teaching as a career and low teaching anxiety (similar to [18]). No significant differences among pre-service teachers' study programs on the three affective variables were found. These high levels of efficacy beliefs reported by our participants may and may not reflect the actual levels of teaching competence. Research shows that people may overestimate their sense of efficacy especially when they are at the development stages of efficacy beliefs [2, 13, 25].

The low levels of teaching anxiety represent a good sign for the effects of the teaching preparation program that these participants have been in since their entry to college of education. As they go through their teaching practicum during their last year, it is expected that their teaching anxiety would decrease. Parsons [30] found pre-service teachers to have significantly higher levels of teaching anxiety than in-service counterparts. In addition, the participants in the current study indicated a medium level of positive attitude toward teaching. This attitude should increase as these teachers get more teaching experience and as they feel more control over the teaching tasks [1].

Moderate relationships among the three pre-service teachers' affective variables were found. The Strongest relationship appeared between teaching Efficacy beliefs and teaching anxiety. The model in which teaching attitude was the predictor of both anxiety and efficacy beliefs seems to be more supported by the current data. Hence, to promote teaching Efficacy beliefs with pre-service teachers, it is advisable to design teacher preparation programs that aim to build positive teaching attitude in the first hand as well as teaching anxiety. This is because teaching attitude affects teaching Efficacy beliefs directly and indirectly through affecting teaching anxiety which by itself elevates teaching Efficacy beliefs.

Because previous research shows that pre-service teachers' attitudes can be promoted through planned instructions and mentoring programs [16], the findings that these attitudes predict teachers' efficacy beliefs emphasize the need for paying attention to the nature of applied experiences these pre-service teachers get during university years and the importance of careful design of preparation teacher programs.

One way to build positive teaching attitudes is by pairing pre-service teachers with qualified experienced teachers through mentoring. As an important way to benefit from an experienced teacher, mentoring can be facilitated to help pre-service and novice teachers better prepare effectively for the teaching profession [16]. Bruce *et al.* [9] found that effective professional learning programs characterized by problem-based teaching influence teachers' efficacy beliefs (p. 1607).

While we argued in our two models for possible effects of anxiety and attitudes on teachers' efficacy beliefs, the relationship can be argued to go the other way. That is, teachers' efficacy beliefs can serve as possible predictor of anxiety and attitudes. Zimmerman and Schunk [36, p. 447] write, "Teachers' perceived efficacy also affects their own vulnerability to stress,

burnout and commitment to the educational profession.” However, this possible effect of efficacy beliefs can be seen after these beliefs become well established; a process that is usually achieved after cumulative mastery experiences in the teaching profession, which is less likely to be available for pre-service teachers in their short teaching practicum.

Based on Lancaster and Bain [26], the challenges in the school contexts during the practicum months are not identical to the conditions in which these pre-service teachers end to teach. Accordingly, designers of teaching practicum should be aware of the aspects of teaching experiences, degree of connection to the future teaching environment, the type of feedback, the extent to which these experiences are mastery promotion and the expected level of student engagement in the adopted teaching instructions.

To conclude, findings from the current study support the importance of both teaching attitudes and anxiety in predicting pre-service teachers’ efficacy beliefs. Longitudinal research design is needed to examine the levels of these three variables following teachers from their pre-service years up to their inservice teaching experiences.

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