An investigation of the effects of teachers' sense of efficacy on teacher motivation for predicting student participation: Do teacher behaviors mediate this relationship?

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AN INVESTIGATION OF THE EFFECTS OF TEACHERS' SENSE OF EFFICACY ON TEACHER MOTIVATION FOR PREDICTING STUDENT PARTICIPATION: DO TEACHER BEHAVIORS MEDIATE THIS RELATIONSHIP?

A Project
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Karen Lynn Wanzung
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ABSTRACT

The present study tested the hypothesis that the combination of teachers' sense of efficacy, and teacher motivation predicts student participatory behavior, and that teacher behaviors mediate this relationship. This study consisted of two parts: surveying community college instructors and observing instructors' lectures and student participation. Results indicated that the hypothesized model was supported and that it was the best fitting model for the data.
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TABLE OF CONTENTS

ABSTRACT ........................................................................ iii
ACKNOWLEDGMENTS ......................................................... iv
INTRODUCTION ................................................................. 1
HYPOTHESES .................................................................... 20
METHODS .......................................................................... 21
RESULTS ........................................................................... 27
DISCUSSION ...................................................................... 33
APPENDIX A: Script for Community College Instructors ... 42
APPENDIX B: Teacher Efficacy Scale ............................. 43
APPENDIX C: Teacher Motivation Scale ......................... 44
APPENDIX D: Teacher Behavior Checklist ..................... 45
APPENDIX E: Student Participation Checklist ............... 47
APPENDIX F: Examples of types of Student Participation 48
APPENDIX G: Hypothesized Model ................................. 49
APPENDIX H: Final Model ............................................. 50
APPENDIX I: Table 1 ....................................................... 51
REFERENCES ..................................................................... 52
INTRODUCTION

Recent research on the process of teaching and learning has discussed the importance of the teacher's role in student learning, specifically how teachers' beliefs, attitudes and behaviors in the classroom affect student learning. According to Brophy (1976), teachers with positive "can do" attitudes are considered to be more successful teachers by becoming more dedicated to student learning regardless of how much time is involved. Brophy and Good (1974) stated that when a teacher develops differential attitudes, the students tend to react in a different way and in ways that will be likely to complement and reinforce the teacher's attitudes. Consequently, this reaction the student has to the teacher can enhance the student's performance.

Brophy and Good (1974) gave an example of how teachers' beliefs and attitudes affect teacher behaviors and how these teacher behaviors affect student outcomes. They suggested that if a teacher believes that he/she is capable of teaching, the teacher will exhibit behaviors that may either verbally or non-verbally demonstrate these beliefs. While an instructor with positive beliefs and attitudes is more likely to encourage student learning, an instructor with lower expectations will be more likely to discourage student learning. If a teacher has low expectations for a student, he/she may give the student
less information or fail to encourage him/her to learn the material. This due to the fact that the instructor believes that he/she is not capable of influencing the students' learning. In this case, the teachers' beliefs and behaviors may affect student performance negatively. These findings emphasize the important role that the teacher plays in the quality of student learning.

Current academic research in this area has focused on the specific teacher belief of his/her sense of efficacy. Teachers' sense of efficacy is a belief that they hold about their capability to influence student learning and/or performance (Ashton & Webb, 1986, Ashton, 1985). There have been some studies supporting the relationship between a teacher's sense of efficacy beliefs and student performance (Ashton & Webb, 1986, Ashton, 1985, Berman, McLaughlin, Bass, Pauly & Zellman, 1977). Educational research indicates the importance of teacher efficacy beliefs in understanding how the teacher's attitudes affect teacher behaviors, teacher motivation, student performance, student behaviors, and other important academic outcomes. For example, Becher (1980) found a link between positive teacher behaviors (e.g., positive feedback) and high student participation. However, a direct connection of teacher efficacy to behaviors leading to high student participation has yet to be found.
Although past research has indicated that self-efficacy is used as a behavioral predictor and that there is a relationship between self-efficacy and performance, it is important that these findings be connected to create a more complete understanding of the role of teachers' attitudes in predicting student participation. The path through which teacher efficacy predicts teacher behavior is unclear. Thus, this study is looking at a more comprehensive model used to explain the importance of the teacher's role in effective student learning. Ashton and Webb (1986) and Ashton, (1985) suggested that a teacher's sense of efficacy is a central construct in explaining teacher motivation. They also suggest that high teacher motivation is essential for school and classroom improvements. Due to the fact that there are no known studies investigating the effects of how teacher efficacy, motivation and behaviors can influence student participation, this study adds several new components to the areas of predicting classroom participation and developing effective teachers. The purpose of the present study is to investigate the role of teacher sense of efficacy and teacher motivation in predicting teacher behavior, and how teacher behavior influences student participation.

The relationship between the beliefs of teachers in their effectiveness and the performance of their students
has been the focus of recent studies in academic settings. The main focus of education research is to examine various predictors of student performance. Therefore, it is critical to understand how teachers play a role in creating effective learning environments that promote high student performance. Student performance is a broad topic with many sub-areas of interest. Morrison and Thomas (1975) investigated student participation as one possible academic outcome. They predicted that a student's level of self-esteem would predict classroom participation. Schunk and Zimmerman (1994) suggest that student participation is a very important component for predicting effective student performance. They stated that it is essential for teachers to create a classroom environment that facilitates student involvement.

Although studies of teacher effectiveness have been abundant, the research in actual classroom settings has been limited. As Schunk and Zimmerman (1994) stated, "Studies were done in a lab so they can be better at predicting, but we are not sure how generalizable they will be." In education, researchers are interested in developing teacher effectiveness programs that will help predict high student performance. Guskey (1985) suggested several teacher development programs, such as workshops or seminars to learn about the theory of effective student learning. In fact, most researchers would agree that one of the most
effective ways to get students to "really" learn the material is by encouraging them to actively participate in the classroom. (Schunk & Zimmerman, 1994). Schunk and Zimmerman (1994) also found that if the teacher allows the student to be mentally active during the learning process, the student will perform higher than if the student was merely a "passive recipient" of the information.

Becher (1980) found that teachers' behaviors, along with student involvement (i.e., interactive instructional strategy) were more effective in facilitating high academic performance than direct instruction. In addition, Pittman (1985) stated that "One avenue of research on teaching effectiveness has been studies to identify teacher behaviors that enhance student performance." Brophy (1974) found that student engagement in work was strongly related to specific teacher behaviors such as asking questions and positive feedback. Brophy stated that this relationship led to high student learning. White and Dekle (1966) found that the teacher's appearance, actions, manners, and motivational cues affected student performance. Although the areas of educational research investigating the effects of various predictors on student performance are numerous, there appears to still be a great deal of research to be done for improving classroom learning.
Teachers' Sense of Efficacy

Bandura (1977) introduced the concept of self-efficacy as an important component in his social cognitive theory. According to Bandura's (1986) social cognitive theory, individuals have a self "mental system" that enables them to exercise a measure of control over their behaviors, beliefs, motivation and attitudes. Bandura (1997) defines self-efficacy as the personal belief that an individual possesses in his/her ability to perform a specific behavior that will result in a certain outcome. In addition, Bandura (1986) states that "individuals select what challenges to undertake, how much effort to put out, and how long to persevere based on their self-efficacy beliefs." Therefore, self-efficacy beliefs can influence performance and can serve as a behavioral predictor.

Stapes, Hulland, and Higgins (1999) suggest that self-efficacy can be applied across a wide variety of situations and can be a good predictor of performance and behavior. Self-efficacy is often used as a predictor of job performance in organizations. Harrison, Rainer, Hochwartzer and Thompson (1997) examined the relationship of self-efficacy perceptions with task specific performance in organizations. They expected that individuals with high self-efficacy perceptions would have higher levels of performance on computer-related tasks. Their results indicated that self-efficacy and performance on the job was
positively correlated. In a study done by Barling and Beattie (1983), they found that self-efficacy predicted sales in a life insurance company. In a meta-analysis investigating self-efficacy and work-related performance, Stajkovic and Luthans (1998) found that the relationship between self-efficacy and job performance was moderated by task complexity and locus of performance. Hill, Smith, and Mann (1987) found that self-efficacy was related to adaptability to advanced technology, which was the work-performance measure used in their study. These findings suggest that self-efficacy leads to performance.

Although general self-efficacy beliefs have been a major focus for predicting various domains of behavior, there has been increasing attention of self-efficacy beliefs in educational research. Taylor, Locke, Lee, and Gist (1984) demonstrated that research productivity of university faculty members was higher for those instructors with high self-efficacy. Lent, Brown, and Larkin (1984) studied the relationship between self-efficacy and objective predictors of academic aptitude and achievement. They found a significant relationship between self-efficacy scores and PSAT (Preliminary Scholastic Aptitude Test) (r=.41). These results suggest that self-efficacy beliefs may be an important cognitive element for student achievement. Bores-Rangel, Church, Szendre and Reeves (1990) tested the hypothesis that there is a correlation
between self-efficacy for academic subject matter areas and performance accomplishment, effort and ability, or skill in the subject matter. The results indicated a statistically significant positive relationship between initial self-efficacy for the subject matter areas and performance in those areas (r = .41). There was no support found for the relationship between self-efficacy and effort. However, there was a significant correlation found between subjects' self-efficacy expectations regarding their skills or ability in the subject matter and their actual skills or ability in that specific subject. Multon, Brown, and Lent (1991) investigated the relationship of self-efficacy beliefs to academic performance and persistence. Their results indicated that self-efficacy beliefs accounted for approximately 14% of the variance in students' classroom performance and approximately 12% of the variance in their persistence. These previous findings indicate that self-efficacy beliefs in general lead to performance. Therefore, these findings lend support to the theory that a teacher's sense of efficacy beliefs lead to student performance.

A domain specific behavioral predictor within educational research currently under investigation is teacher's sense of efficacy (Ashton, 1985; Ashton & Webb 1986; Bandura, 1993; Schunk, 1991). They define teachers' sense of efficacy as the extent to which teachers believe
they can influence student learning. For example, teacher efficacy beliefs have been found to be related to their instructional techniques and various student outcomes such as, student self-efficacy, student motivation and student performance (Ashton & Webb, 1986). Berman, McLaughlin, Bass, Pauly & Zellman (1977) found a moderate correlation (r = .21) between teacher sense of efficacy and student gains in learning. Their results indicated that a teacher's sense of efficacy is a possible intervening variable influencing teachers' behaviors.

Denham and Michael (1981) proposed a model to guide future research on teachers' sense of efficacy. Their model consisted of three major components: teacher sense of efficacy, measurable consequences of teacher sense of efficacy (i.e., teacher behaviors, student outcomes), and antecedents of teacher efficacy (i.e., teacher training, teaching experiences, personal variables, and system variables). The model shows a reciprocal relationship between antecedent conditions and teacher sense of efficacy to measurable consequences. Teacher sense of efficacy is defined as an intervening variable that mediates the relationship between antecedents and consequences. The specific paths of these relationships are not yet determined. Based on their model one can assume that a teacher's sense of efficacy has an affect on student performance outcomes. According to Denham and Michael
(1981), teaching efficacy is thought to be the basis for more productive teaching. Within their paper they also reviewed some of the literature within the business environment to gain insights regarding teacher efficacy. For example, they mentioned a study conducted by Carnell (1978) where self-efficacy contributed to a trainee's success in the training program. Carnell (1978) found that poor training left employees feeling unprepared and nervous resulting in a high turnover rate. Therefore, Denhan and Michael (1981) suggested that teacher training might affect sense of efficacy. In an article written by Pajares (1992), he suggested that teachers' beliefs (i.e., self-efficacy) should become an important focus of educational research investigating predictors of student outcomes. In his review of the educational research literature he stated that, "neither the nature of educational belief acquisition or the link to student outcomes has yet been explored carefully." Pajares (1992) included a quote written by Arthur Combs, "Perhaps the most important single cause of a person's success or failure educationally has to do with the question of what he believes about himself." This quote emphasizes the importance of self-efficacy beliefs in academic settings.

The concept of teachers' sense of efficacy has been broken down further into two separate dimensions: teaching efficacy and personal efficacy (Ashton, 1985). She states
that teaching efficacy refers to the teachers' expectations that teaching can influence student outcomes (i.e., learning and performance). Ashton (1985) suggests that teachers differ in the magnitude to which they believe that teaching can have an effect on student performance, in spite of environment obstacles (i.e., family background). Teachers with a high sense of teaching efficacy believe that all of their students are capable of performing well in class and learning effectively in class (Ashton, 1985, Ashton & Webb, 1986). On the other hand, Ashton (1985) defines personal efficacy as "the individual's assessment of their own teaching competence." These beliefs are more specific to the teachers' perceptions of their own abilities that influence their choice of teaching styles and classroom control techniques (Ashton, 1985). For instance, when teachers' personal sense of efficacy is low they believe that they lack the skills, knowledge, and/or abilities to teach low-achieving students, and that they cannot make a significant difference in student learning (Ashton & Webb, 1986). The results from Ashton and Webb's (1986) study indicated that teachers' sense of efficacy is of significant value in understanding their interactions with students (i.e., facilitating student participation). Bandura (1993) suggests that teachers' sense of efficacy is an important determinant for creating an effective learning environment for the students. For example, he states that
teachers who have a high sense of teacher efficacy will create "mastery classroom environments" for their students. On the other hand, those teachers who have a low sense of teacher efficacy will be likely to create classroom environments where the students' abilities for successful performance are doubted.

Teacher Motivation

Motivation is a construct that has been thoroughly investigated in the literature. Generally, motivation is defined as a construct that reflects the exertion of effort and hard work on a task. Campbell and Pritchard (1976) define motivation as "the choice to initiate effort, the choice to expend a certain amount of effort, the choice to persist in expending effort over time." Sanzotta (1977) states that motivation is used to explain behavior and the causes of behavior. He suggests that motivation can be used to predict behavior. For this study, teacher motivation is operationally defined as the motivation of the teacher to perform encouraging behaviors in the classroom. Teacher efficacy is predicted to lead to teacher motivation, which leads to the performance of encouraging behaviors.

Pintrich and De Groot (1990) conducted a correlational study investigating the relationships between teacher’s motivational orientation, self-regulated learning, and student performance in 173 seventh graders. Their results indicated that motivational components are related in
significant ways to student cognitive involvement and student performance. In addition, these results suggest the importance of teachers creating this "highly motivating environment." In a study looking at classroom learning environment in relation to achievement goal theory of motivation, Ames (1992) stated that, "researchers and educators should focus on quality of involvement and continuing commitment to learning as consequences of different motivational patterns." However, the studies investigating specific predictors of teacher motivation are lacking.

Ashton and Webb (1986) stated that there is little research examining why there is a decrease in teacher motivation. In addition, they suggest that this decline in teacher motivation indicates a need to increase our understanding of the impact of teacher motivation on student performance. White and Dekle (1966) document that the teachers' motivational cues (i.e., warm, affable, deferring teacher behavior) influenced "favorable" or "unfavorable" reactions in students. Their results indicated that the amount of teacher's warmness, affableness, and deferring motivational cues were a function of student achievement levels of fifth, sixth, and seventh grade students. These findings suggest the teachers should "arouse emotional responses of "feeling good" in connection with the instructional content if the teacher is
desirous of having students achieve at the level of their ability or beyond" (White & Dekle, 1966). Since teacher motivation appears to be an important component associated with teacher behaviors and student achievement, it is dangerous to assume that teachers are motivated people who want to teach.

As Bong (1996) stated, one of the problems in current academic motivation research is that there is no one single model that can "capture the full dynamics of motivated behaviors." Bong (1996) further emphasized the problems within academic motivation research in which the "distinction among constructs often gets blurred in that which is related to the self or to subjective perceptions" (i.e., a teacher's perceptions about their level of motivation to teach the students). Thus, further research is necessary in order to gain a more comprehensive understanding of how teacher motivation affects teacher behaviors and how those behaviors influence student performance.

Teachers' Sense of Efficacy and Teacher Motivation

Efficacy can contribute to motivation in several ways. Bandura (1997) discussed a mediational analysis in which "neither anchoring influences nor cognitive focus had any affect on motivation when perceived self-efficacy was controlled. Therefore, the effect of external influences was entirely mediated by the degree to which they changed
their efficacy beliefs." In a study done by Garcia and Pintrich (1996), they found that self-efficacy was a critical element of "continuing motivation." Ashton and Webb (1986) suggested that teachers' motivation to perform well in the classroom was a function of their sense of teacher efficacy. In addition, results from their studies indicated a significant relationship between teachers' sense of efficacy, behavioral outcomes, and student performance. Schunk and Zimmerman (1994) stated that when self-efficacy beliefs were high, motivation also tended to be high, creating a classroom environment where student performance was higher. Schunk (1991) affirms that teachers with high efficacy are more likely to develop challenging activities, help student performance, and persist with the students who are having difficult time learning. This creates motivational effects that can increase student learning and further increase the teachers' sense of efficacy because they feel that they could help their students to learn, despite many obstacles.

Although there have been several studies done investigating how self-efficacy beliefs and the motivation of students affect student behaviors and performance, studies looking at teacher efficacy and motivation and the effects on teacher behavior and student performance are lacking. Further research is necessary to determine how to increase student performance through the attitudes, beliefs
and behaviors of teachers. As Schunk (1991) suggests, "Self-efficacy and motivation are applicable to teachers as well as students." Therefore, he also states the necessity and relevancy for further research in this area.

Teachers' Behaviors in Relation to Self-Efficacy and Motivation.

The statement, "What a teacher does is what the student gets" (Madsen & Yarbrough, 1985, p. 8), indicates the importance of teacher behaviors in student learning. Teacher behaviors are one manifestation of a teacher's beliefs (i.e., teacher efficacy) and attitudes (i.e., teacher motivation). Bandura (1986) says that self-efficacy beliefs affect choice and persistence of behaviors. Lent, Brown, and Larkin (1984) state that, self-efficacy expectations, meaning beliefs about one's ability to successfully perform a given task or behavior, are hypothesized to determine whether coping behavior will be initiated, how much effort will be expended (i.e., motivation), how much effort will be sustained in the face of obstacles and aversive experiences. Past teacher effectiveness research has indicated specific teacher behaviors (both verbal and non-verbal) that were related to student performance and teacher beliefs (Brophy, 1979, and Crawford & Stallings, 1978). Feldman (1976) suggests that the teacher's non-verbal behavior may "reveal subtle expectancies that the teacher holds for students."
Therefore, the teachers' encouraging or discouraging behaviors may indicate their level of efficacy beliefs. Ashton (1985) states that teachers may respond differently to their students because of their self-efficacy beliefs regarding their capability to teach the students, resulting in different degrees of student performance. These findings support the role that self-efficacy beliefs play in teacher behaviors. An example of how a teacher's sense of efficacy beliefs affect teacher behaviors was demonstrated in a study conducted by Ashton and Webb (1986). They found that those teachers who had a low sense of teaching efficacy for teaching math concepts to girls displayed the following behaviors: they tended to pay less attention to the girls in the class, waited less time for their responses to questions, gave them less help in difficult situations, reprimanded them more successively for wrong responses, praised them less frequently for correct answers, punished them more frequently for insufficient responses, demanded less work and effort from them and interrupted their performance more often. Ames and Ames (1985) found that both nonverbal and verbal teacher behaviors are related to effective student performance. For example, they suggest that teacher's nonverbal behavior (i.e., nodding their head) may disclose subtle expectations that the teacher has for his or her student. Thus, this nonverbal behavior may reveal a teacher's sense of efficacy.
beliefs. In addition, Ames and Ames' (1985) study indicated that teachers with a high sense of teaching efficacy were more likely to persist with a student in a hard to understand situation (e.g., asking students specific questions which encourages participation). On the other hand, they found that teachers with a low sense of teaching efficacy would be more likely to move on to another student or give the correct answer themselves (e.g., cut-off discussion which discourages participation). Overall, they suggested that, "teachers sense of efficacy is a cognitive mediating process that contributes to the relationship between teacher behavior and student achievement.

Motivation has been found to be related to important teacher behaviors. For example, if an instructor is motivated to teach the students, then he/she will exhibit more behaviors that will reinforce learning in the classroom (e.g., praise, remind, and prod students). On the other hand, for the instructor that is not willing or motivated to put forward the effort to teach their students, that instructor may display discouraging participatory behaviors (e.g., punishment, negative facial feedback). Pittman (1985) found that the motivation of the instructor affected his/her behaviors (e.g., amount of teacher understanding), which resulted in increased student learning. Thus, the motivation and self-efficacy level of the instructor can affect his/her behavior, which in turn
will affect the student's performance (i.e., participation).
HYPOTHESES

Sub Hypothesis 1: Teacher behavior is a latent variable indicated by verbal and non-verbal behaviors.

Sub Hypothesis 2: Student participation is a latent variable indicated by frequency and variety of participatory behaviors.

Hypothesis 3: It is hypothesized that teachers’ sense of efficacy (i.e., Teachers’ belief in their capability to affect student learning) will predict teacher motivation (i.e., How motivated is the instructor is to perform encouraging behaviors).

3a. It is hypothesized that the combination of teachers’ sense of efficacy, and teacher motivation will predict student participatory behavior (frequency and variety), and that teacher behaviors (non-verbal, verbal, encouraging and discouraging) will mediate this relationship.
METHODS

Participants

One hundred participants were taken from Palomar Community College, Miramar Community College and Miracosta Community College. There were several reasons for selecting community college instructors as the population for this study. The role of the instructors in community colleges is essential for determining if the students will continue on to a four-year university and/or prepare themselves for a career. Unlike a four-year university where the students "assume" that they will be there for four years, in a community college the students are unsure of their future career and academic plans. Thus, the community college instructors need to focus even more heavily on quality student learning and to build a strong foundation for the students' future success.

This study took place in an "actual" classroom setting. A wide variety of courses were used: 4 aviation classes, 3 history classes, 1 music class, 4 English classes, 8 business classes, 16 math classes, 8 law classes, 3 humanities classes, 7 art classes, 2 speech classes, 21 science classes, 3 ESL classes, 1 nursing class, 1 political science class, 11 psychology class, 5 social science classes, and 2 Spanish classes. The various times of the classes ranged from 7:00 am to 6:00 pm. The class sizes ranged from 7 students to 41 students. There
were 68 male instructors and 32 female instructors. The instructors' number of years teaching experience ranged from 4 years to 44 years, with an average of 18.85.

Procedures

This study consisted of three predictors: teacher sense of efficacy, teacher motivation and teacher behaviors. The criterion measure was frequency of student participation (the number of students that participate and the variety of their responses). The design was a between subjects design within a field setting.

This study was a two-part study. The first part was a survey and the second part was a 30-minunte classroom observation. Instructors were contacted during their office hours by the researcher. A script was read to each instructor (Appendix A) to briefly introduce the study and to recruit participants. After the participants were administered the survey a time was scheduled for the researcher to observe. The participants were asked to return the survey to the researcher on the day of the observation. The rater sat in the back of the classroom, which allowed the teacher's behaviors to be observed along with the student's participatory behaviors. All the dimensions from the Teacher behavior checklist and the Student participation behavior checklist were explained. All participants, prior to the observations, completed an informed consent form and were debriefed at the end of the
observation. The participants were treated according to the APA ethical guidelines.

Measures

Each instructor was given an informed consent and a survey: Teacher efficacy scale and Teacher motivation scale.

Teacher Efficacy Scale

The Teacher Efficacy Scale developed by Gibson and Brown (1982) was used to measure the teachers' level of efficacy regarding teaching abilities. This scale has a total of 30 items in which the teachers respond using a 6-point Likert scale (1 = "strongly disagree to 6 = "strongly agree"). For this study only 9 of the 30 items were used due to the adult population (Appendix B). The items that were removed were not valid for college instructors. The items used were determined by a pilot study that was conducted at California State University, San Bernardino. The purpose of this pilot study was to increase the reliability of the Teacher Efficacy Scale for college instructors, since the scale was originally used for elementary school teachers. A reliability analysis performed after deleting the addition items (total items=9), resulted in a standardized Cronbach alpha reliability coefficient of .8332, n=12. Thus, this scale appeared to be a reliable indicator of self-efficacy for the present study. In this study, a reliability analysis
was performed on these 9 items that resulted in a standardized Cronbach alpha of .6348, n=98. Although the reliability of the scale for this study resulted in a low to moderate alpha coefficient, anything .60 or above is considered the minimum to be acceptable according to Robinson, Shaver and Wrightsmith, (1991).

Teacher Motivation Scale

The scale used to measure teacher motivation is a similar measure with responses also using a 6-point Likert scale. Since there is no known existing measurement specific for measuring teacher motivation in this context, dimensions of several motivation scales from a previous study were used. The dimensions were taken from Kottkamp & Derczo's (1986) Principal expectancy motivation scale (PEMS) (Appendix C). The coefficient alpha estimates were from .74 to .91 for the five scales used in their study. However, the dimensions were adjusted specifically for teachers rather than principals. Several items were added to make the scale more specific for the purposes of this study. A reliability analysis was performed indicating an overall Cronbach alpha of .8526 for a total of 9 items, n=96.

The observer used the following observational instruments: A Teacher Behavior Checklist (Appendix D) and a Student Participation Behavior Checklist (Appendix E).
Teacher Behavior Checklist

The dimensions used in the Teacher Behavior Checklist were taken from Soar and Soar's (1981) Climate and Control Schedule and the Ashton (1985) studies. This apparatus consists of items that provide a record of the climate and control components of the classroom. The items that measure teachers' behaviors (verbal and nonverbal) were used. The teacher behaviors are divided into four categories: verbal/encouraging behaviors (i.e., teacher tells student good job), non-verbal/encouraging behaviors (i.e., teacher raises eyebrows showing interest in what the student is saying), verbal/discouraging (i.e., teacher tells student, "That wasn't what I was looking for") and nonverbal/discouraging (i.e., teacher shakes his/her head in a negative way as if he/she was saying no), (Appendix D). A mark was noted each time the appropriate behavior was observed. The items taken from the Ashton (1985) studies are dimensions that were significantly correlated with the teacher efficacy scale used in that study.

Student Participation Behavior Checklist

The Student Participation Behavior Checklist was designed to measure the frequency of student participation and the variety of participation (Appendix E). Frequency was scored by checking each time a student participates. The frequency score is the total number of students that have participated divided by the total number of students.
in the class. Variety was scored by marking when one of the ten types of participation had occurred. When the rater observed one of the types of participation he/she checked off that type. The variety score is a rating of 1 to 10 depending on how many types of participation were observed in the classroom. The rater was given examples of each type of participation (Appendix F). Prior to each observation, classroom demographics were recorded such as total number of students in the class, time of day, class title, and gender of the teacher.
RESULTS

Means and standard deviations for all variables are reported in Appendix I. The mean response on a 6-point Likert scale for teacher efficacy was 4.28, this indicates that the teachers were moderately high in teacher efficacy. The mean response on a 6-point Likert scale for teacher motivation was 5.35, this indicates that the teachers' were very motivated. The mean for encouraging verbal teacher behaviors was 63.74 for a 30-minute lecture period. The mean for encouraging non-verbal teacher behaviors was 14.52 for a 30-minute lecture period. For student participation frequency the mean was 50.44 percent. This percentage took into account the size of the class. The mean variety of student participation responses was 4.63 out of 10 possible types of student participation. The average number of students in a class was 21.74. The average number of years teaching experience the teachers had was 18.85 years.

Assumptions

Assumptions were evaluated through SPSS and EQS. SPSS FREQUENCIES were performed to evaluate the assumption of normality. As predicted histograms indicated that the assumption of normality was violated in several of the variables. Non-verbal discouraging teacher behaviors was positively skewed as expected. Verbal discouraging teacher behavior was positively skewed as expected. Teachers were predicted to display very few if any at all verbal and/or
non-verbal discouraging behaviors. Verbal encouraging teacher behavior was normally distributed. Non-verbal encouraging teacher behaviors was slightly positively skewed. Teacher efficacy and teacher motivation were both negatively skewed as expected. Teachers that participated in this study were predicted to be high in both teacher efficacy and teacher motivation. Both the student participation variables were normally distributed: frequency and variety. These variables were not transformed because it is reasonable to expect this pattern of skewness in the population. Multivariate normality was assessed also with a Mardia’s coefficient test resulting in a z score of 14.4694, suggesting that the measured variables are not distributed normally. Therefore, maximum likelihood estimation with the Satorra-Bentler scaled chi-square was employed.

The assumption of linearity was tested through an SPSS REGRESSION scatter plot. The scatter plot indicated a liner relationship was present between the dependent variable and the predictors.

Using Mahalanobis distance coefficient, nine multivariate outliers were detected, p < .001. These cases were all from the intended population but the distribution for the variable in the population has more extreme values than a normal distribution. Several of the multivariate outliers either scored lower or higher on the teacher
efficacy and teacher motivation measure or exhibited a lot more or a lot less of the teacher encouraging behaviors. However, I left the outliers in the analysis because the combination of the variables that are essential for the main hypotheses is where the outliers are present. Thus I felt it necessary to leave the outliers in the analysis to avoid losing valuable information.

One hundred subjects were observed. However, subject number 60 did not fill out the teacher motivation scale, therefore number 60 was removed from the analysis. There were a total of six missing data points for questions on the teacher efficacy and teacher motivation. Therefore, the mean for each subject for the teacher efficacy and teacher motivation scale was computed in order to not lose subjects data.

The Hypothesized Model

Using EQS, relationships were examined between Teacher Behaviors, a latent variable with two indicators (verbal behaviors and non-verbal behaviors), and Student Participation, a latent variable with two indicators (variety and frequency). Also included in the analysis were measured indicators of teachers' sense efficacy and teacher motivation. The hypothesized model is presented in Figure 1 (Appendix G). Circles represent latent variables, rectangles represent measured variables. Absence of a line connecting variables implies lack of a hypothesized direct
effect. Within the text latent variables are referred to with initial capital letters, measured variables are fully lower case.

Figure 1 (Appendix G) illustrates the hypotheses that teacher behaviors directly affect Student Participation and teachers' sense of efficacy predicts teacher motivation. The combination of teachers' sense of efficacy, and teacher motivation predicts Student Participation (frequency and variety). The relationship between teachers' sense of efficacy, teacher motivation and Student Participation is mediated by Teacher Behaviors (verbal and non-verbal).

Model estimation

The independence model that tests the hypothesis that the variables are uncorrelated with one another was rejected, $\chi^2 (15, N = 99) = 178.791, p < .01$. The hypothesized model was tested next. A chi-square test indicated a significant improvement in fit between the independence model and the hypothesized model; strong support was found for the hypothesized model in terms of the Satorra-Bentler scaled $\chi^2$ test statistic, the robust comparative fit index (CFI),
and the standardized root mean squared residual (RMSEA), $\chi^2(7)= 6.0903$, $p > .2$, robust CFI= 1.000 (see footnote), RMSEA= .079.

**Direct effects**

Verbal encouraging behavior predicted teacher behaviors (standardized coefficient = .864, $p < .01$). Non-verbal encouraging behavior predicted of teacher behaviors (standardized coefficient = .427, $p < .01$). Student participation frequency predicted student participation (standardized coefficient = .819, $p < .01$). Student participation variety predicted student participation (standardized coefficient = .530, $p < .01$). Teacher motivation was predicted teacher efficacy (standardized coefficient = .638, $p < .01$). Teacher behavior did not predict teacher motivation (standardized coefficient = -.089, $p > .01$). Teacher behavior did not predict teacher efficacy (standardized coefficient = .010, $p > .01$). Student participation predicted teacher behaviors (standardized coefficient = 1.00, $p < .01$)(Appendix H).

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*Note*- The reason CFI equals one is there was a constrain at the lower bound. For further research it is suggested that at least one more indicator is added because the relationship among these variables may be spurious.
Indirect effects

Teacher behaviors moderately mediated the relationship between teacher motivation and student participation (standardized coefficient for indirect effect = -0.089, p < .01); teachers high in motivation performed more encouraging teacher behaviors thus resulting in higher levels of student participation. Teacher behaviors moderately mediated the relationship between teacher efficacy and student participation (standardized coefficient for indirect effect = -0.047, p < .01); teachers high in teacher efficacy performed more encouraging behaviors resulting in higher levels of student participation.
DISCUSSION

The overall purpose of this study was to investigate the role of teacher sense of efficacy and teacher motivation in predicting teacher behaviors and how teacher behavior influences student participation. This final section of the paper will provide: interpretations of the findings, limitations of the study, implications of the study, and suggestions for future research.

Results of the structural equation model analysis provide support for the overall hypothesized model, indicating that the combination of teacher efficacy and teacher motivation predicts student participatory behavior, and that this relationship is mediated by teacher behaviors. Consistent with past research (Brophy and Good, 1974), teachers' beliefs and attitudes affect teacher behaviors, in turn affecting student outcomes. Teacher behaviors directly predict student participation, which is consistent with previous educational research (Becher, 1980).

Based on the results of the structural equation model analysis several individual links of the model are not supported. First of all, teacher efficacy and teacher motivation do not predict teacher behavior. As stated previously in the introduction, the path through which teacher efficacy predicts teacher behavior is unclear. The results from this study do not give any indication of a
direct path through which teacher efficacy predicts teacher behavior. These results are inconsistent with past self-efficacy research stating that self-efficacy can be used as a direct behavioral predictor, (Bandura, 1977, and Stapes, Hulland, and Higgins, 1999) and with research that suggests motivation can explain behavior and the causes of behavior (Sanzotta, 1977). In addition, past research has indicated that self-efficacy beliefs affect motivation and that self-efficacy and motivation affect behaviors (Bandura, 1986, and Brophy, 1979).

Inconsistency with past findings may be due to the fact that there was a small sample for structural equation modeling. The sample size requirements for the effectiveness of structural equation modeling to be maximized are a ratio of 1:10 (parameters to people). This means that for the purposes of this study there should have been a minimum of 130 instructors sampled.

Another reason for the inconsistency may be the small variability of the sample. As seen in the descriptive statistics, the mean for both teacher efficacy and teacher motivation was very high, thus indicating range restriction. The instructors that agreed to participate were comfortable with the survey and the observation. However, the instructors that chose not to participate said they were uncomfortable with the researcher observing their classroom and/or they did not feel comfortable with the
questions on the teacher efficacy and teacher motivation survey. Since there is very little variance in the teacher sense of efficacy scores and their motivation scores, the two variables may have "cancelled" each other out because they are so highly correlated.

The results suggested that the variety and the frequency of student participation are both indicators of the latent variable student participation. Frequency of student participation has been shown in past literature to be an indicator of student participation (Zimmerman, 1994). However, the addition of variety as an indicator of student participation is a new finding. Thus, not only is the frequency of student participation important to examine, but also the type of participation that the student displays. In addition, the results from this study suggest that verbal and non-verbal teacher behaviors are indicators of the latent variable teacher behavior. These results are consistent with past research that both verbal and non-verbal teacher behaviors are related to effective student performance (Ames and Ames, 1985).

Secondary correlation analyses were conducted to examine significant relationships among the variables. The total number of students in the classroom was significantly negatively correlated (r= -.34) with frequency of student participation. This could indicate that the larger the class size the less frequent the
student participation. This makes sense because it is easier for more students to "hide" in the back of the class and not participate if there are more students in the classroom. Moreover some students may be intimidated to speak in large groups. Other factors such as, time of the day, gender of the teacher, subject matter, and number of years of teaching experience did not significantly correlate with any of the other variables.

Although the hypothesized model did fit the data well and various components of the model were also supported, there were several limitations to this study that need to be mentioned. As stated previously the small sample size could be a problem due to the large sample size requirements for structural equation modeling. In this study there were 13 parameters, requiring that at least 130 instructors should be surveyed and observed. However, over 130 instructors were contacted but approximately 30 of them declined and/or failed to contact the researcher for an observation time. The time allotted for data collection in this study did not allow for additional community colleges to be sampled, therefore, 100 instructors were the final count to be obtained.

This leads to a second limitation stated previously; range restriction of the variables, teacher efficacy and teacher motivation. The results of this study may be difficult to generalize to all community college
instructors because of the small number of instructors that scored low on the efficacy and motivation measure. According to this study, the majority of instructors that did participate scored high on both teacher efficacy and motivation. However, what about the instructors with low motivation and/or low teacher efficacy? Would they exhibit the same encouraging teacher behaviors and would student participation be high in those classes? In addition to the number of teachers that scored high on the teacher efficacy and the teacher motivation survey, those same teachers appeared to exhibit a large number of encouraging teacher behaviors and a small number of discouraging teacher behaviors. This limits the generalizability of these results because the teachers that exhibit discouraging behaviors may be the same instructors that have low teacher efficacy and motivation.

A third limitation of this study was the subjectivity of the survey. Throughout the study, several instructors commented on how subjective the survey questions were and that there were multiple interpretations to these questions. Some instructors also commented on how there were numerous factors that could contribute to each one of the statements on the survey. For example, they suggested that the students' attitudes and beliefs play a large role in many of the dimensions measured on the teacher efficacy and teacher motivation survey. Therefore, several of the
items on the survey should have been reworded to clarify who was being referred to, the teacher or the student.

Another problem in this study is the fact that the instructors knew they were being observed. Although they were unaware of exactly why they were being observed, they were aware that the observation was taking place. Thus affecting whether the teacher’s performance was their typical performance or their maximal performance. In addition, given that there was only one rater involved in the observations, observer bias may decrease the representational validity of the study.

Because there are many components that can or do contribute to student performance in the classroom, a final limitation should be considered. Additional variables should have been included in the model to provide a more complete explanation for the outcome student participation. For example, the relationship between teacher efficacy, teacher motivation, and teacher behaviors may have been supported if teaching style was included as a variable or if the students attitudes were included in the study. Past research has indicated the importance of students’ attitudes and beliefs and how they affect teachers’ attitudes and beliefs. Since the dynamics of the classroom are very complex, all aspects and components must be considered in a comprehensive model including all possible predictors and variables.
Past educational research has indicated the need for several teacher development programs, such as workshops or seminars to adopt the theory of effective student learning (Guskey, 1985). This study supports several of the same recommendations. Given that teachers' encouraging behaviors are predictive of student participation, teachers could be trained specific verbal and non-verbal behaviors that could be applied in the classroom to facilitate student participation. Many teachers may be unaware of their own behaviors or alternative behaviors that could encourage student participation. After teachers have been teaching for many years, certain classroom behaviors and teaching styles become habitual. Developmental programs would encourage instructors to "break" their old, bad habits. In addition to the academic environment, a training program could also be applied to adult education in organizations. Trainers could be taught how to perform encouraging behaviors to facilitate participation among their trainees. The goal of the training program would be to increase the quality and quantity of teacher-student or trainer-trainee interactions while increasing performance. As stated previously in the introduction, there have been many studies done on teacher effectiveness; however, the research in actual classroom settings has been limited. Since this study was done in an actual classroom setting the results are more generalizable than if the study were
conducted in a laboratory setting (Schunk and Zimmerman, 1994).

As stated previously, the classroom environment has many components that must be considered in order to completely explain student participatory behavior. Thus, several recommendations can be made for future research directions in education.

First of all, the speed that the material is presented should be considered. For example, if an instructor is under time constraints to teach a certain lesson, there may not be a sufficient amount of time allowed for student participation. Secondly, the subject or discipline is another classroom variable that may affect student participation. For some subjects such as psychology, students can relate their own lives to the material, facilitating participation. However, more abstract subjects such as algebra can be difficult for students to relate mathematical equations to their own lives. Another variable to be investigated is the physical environment in the classroom. For example, if the desks are arranged in a way that puts the students closer to the instructor or if the desks are arranged in a circle the students may be more willing to participate.

Cultural differences among the students and instructors are another component to examine. Since the population of students and instructors at community
colleges is very diverse it is important to look at differences among various races, ethnicities, and gender. The students' attitudes, beliefs, and behaviors are important to investigate because the students may have an effect on the teachers and vice-versa.

Performance measures of both students and teachers can relay some important insights into effective learning environments. Future research might want to look for differences between groups, such as four-year universities compared to community colleges or adjunct faculty compared to tenure track faculty. Multiple raters are recommended to avoid researcher bias. In conclusion, the possibilities for improving college-learning environments are numerous when research is applied.
APPENDIX A: Script for Community College Instructors

The researcher said the following to each instructor: "Hi, my name is Karen Wanzung and I am a graduate student at Cal State University, San Bernardino. I am currently working on my master’s thesis in Industrial and Organizational psychology. The population of interest in my study is community college instructors, therefore, I was wondering if you would be interested in participating in my study? (If they agree then I continue on, if they do not then I tell them thank you for their time) Great! Basically this study is a two-part study, the first part is what I need your help with. I have a survey that will take about 5-10 minutes of your time, in which you may fill out at your convenience. The second part of the study I will schedule a time to come to one of your classes and observe for a 30-minute lecture period. In this study you will be completely anonymous and the only way you will be identified is by a number. (At this point I hand them the survey that measures teacher sense of efficacy and teacher motivation along with the informed consent). If you have any questions or comments at this time please feel free to ask."
APPENDIX B: Teacher Efficacy Scale

Please indicate the degree to which you agree or disagree with each statement. Please rate your responses using the following Likert Scale:

1= strongly disagree
2= moderately disagree
3= disagree slightly, more than agree
4= agree slightly, more than disagree
5= moderately agree
6= strongly agree

1. By exerting extra effort, I can help a student do better than usual.

2. If a teacher has adequate skills and motivation, she/he can get to the most difficult students.

3. Individual differences among teachers account for wide variations of student achievement.

4. When a student gets a better grade than he usually gets, it is usually because I found better ways of teaching that student.

5. Teachers are not a very powerful influence on student achievement when all factors are considered.

6. When the grades of my students improve it is usually because I found a more effective teaching approach.

7. If necessary, I would feel confident that I have the necessary skills to implement an unfamiliar curriculum.

8. If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson.

9. If a student in my class becomes disruptive and noisy. I feel assured that I know some techniques to redirect him/her quickly.
APPENDIX C: Teacher Motivation Scale

Please indicate the degree to which you agree or disagree with each statement. Please rate your responses using the following Likert Scale:

1=strongly disagree
2=moderately disagree
3=disagree slightly, more than agree
4=agree slightly, more than disagree
5=moderately agree
6=strongly agree

1. I am willing to put in extra effort to help students achieve.

2. I constantly strive to build excellence into my instructional programs for all students.

3. I think high student participation is essential for effective student learning.

4. I am motivated to facilitate high student participation in learning.

5. I want to make a positive difference in the students' education.

6. Good job performance by a teacher requires hard work.

7. Putting forth a high degree of effort leads to a high level of performance.

8. High personal initiative leads to the attainment of the desired educational objectives.

9. Working as hard as I can results in goal accomplishment.
APPENDIX D: Teacher Behavior Checklist

(Please place a check mark next to the teacher behavior each time the teacher performs that specific behavior.)

<table>
<thead>
<tr>
<th>VERBAL/ENCOURAGING</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>Yes</td>
<td>Total</td>
</tr>
<tr>
<td>Teacher gives rewards.</td>
<td></td>
<td></td>
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<tr>
<td>Teacher promises rewards.</td>
<td></td>
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<tr>
<td>Teacher praises general.</td>
<td></td>
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<tr>
<td>Teacher praises individual.</td>
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<tr>
<td>Teacher reminds, prods (follow-up).</td>
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<td></td>
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<tr>
<td>Teacher asks questions.</td>
<td></td>
<td></td>
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<tr>
<td>Teacher acknowledges student(s).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher agrees.</td>
<td></td>
<td></td>
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<tr>
<td>Teacher asks for status.</td>
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<thead>
<tr>
<th>NON-VERBAL/ENCOURAGING</th>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Behavior</td>
<td>Yes</td>
<td>Total</td>
</tr>
<tr>
<td>Teacher gives rewards.</td>
<td></td>
<td></td>
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<tr>
<td>Teacher nods.</td>
<td></td>
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<tr>
<td>Teacher smiles.</td>
<td></td>
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<tr>
<td>Teacher gives any other facial feedback.</td>
<td></td>
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<tr>
<td>Teacher has eye contact with the student in which he/she is communicating to.</td>
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<tr>
<td>Teacher gives body English, waits.</td>
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<th>VERBAL/ DISCOURAGING</th>
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<tr>
<td>Behavior</td>
<td>Yes</td>
<td>Total</td>
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45
Teacher sounds defensive.
Teacher scolds, punishes (follow-up).
Teacher interrupts, cuts off student(s).

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<tr>
<th>NON-VERBAL/DISCOURAGING Behavior</th>
<th>Yes</th>
<th>Total</th>
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<tbody>
<tr>
<td>Teacher gives any other facial feedback.</td>
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<tr>
<td>Teacher shakes head.</td>
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<tr>
<td>Teacher glares.</td>
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<tr>
<td>Teacher frowns.</td>
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<td></td>
</tr>
<tr>
<td>Teacher nods.</td>
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Total Verbal/Encouraging Behaviors = _______
Total Non-Verbal/Encouraging Behaviors = _______
Grand Total Encouraging Behaviors = _______

Total Verbal/Discouraging Behaviors = _______
Total Non-Verbal/Discouraging Behaviors = _______
Grand Total Discouraging Behaviors = _______
APPENDIX E: Student Participation Checklist

Classroom demographics:
Class number____
Total number of students in the class____
Time of day____
Class title____________
Gender of teacher____

Student Participation Behavior Checklist

Frequency (How many students responded?)

(Please check each time a student participates)

<p>| | | | | |</p>
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Variety (Please check if this type of participation has occurred)
1. Conceptual/Question/Verbal
2. Conceptual/Response/Verbal
3. Clarifying/Question/Verbal
4. Clarifying/Response/Verbal
5. Clarifying/Response/Non-Verbal
6. Administrative question
7. Opinion/Question/Verbal
8. Opinion/Response/Verbal
9. Opinion/Response/Non-Verbal
10. Small group discussion

Frequency score= \( \frac{\text{Total number of times students participated}}{\text{Total number of students in the class}} \)

Variety score= 1 2 3 4 5 6 7 8 9 10
APPENDIX F: Examples of types of Student Participation

Examples of Each Type of Student Participation

1. Conceptual/Response/Verbal: "X" is related to "z" because...

2. Conceptual/Question/Verbal: How is "x" related to "z"?

3. Clarifying/Question/Verbal: What does that word say on the board?

4. Clarifying/Response/Verbal: The definition of "x" is...

5. Clarifying/Response/Non-Verbal: Teacher asks students: "How many of you understand what I am discussing?" Students reply with raising their hands.

6. Administrative question: Is this material going to be on the exam?

7. Opinion/Question/Verbal: What do you think of "xyz"?

8. Opinion/Response/Verbal: I think in my experiences with "xyz"....

9. Opinion/Response/Non-Verbal: The students respond by raising their hands, to a question such as, "Do you guys believe in "xyz"?

10. Small group discussion: The students are asked to form small groups and work on a project, therefore, discuss in their groups.
Teacher behavior

Teacher efficacy

Teacher motivation

Student participation

E1: verbal

E2: non-verbal

D1

D2

E3

E4: frequency

E5: variety
APPENDIX I: Table 1

Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Efficacy</td>
<td>4.28</td>
<td>.59</td>
</tr>
<tr>
<td>Teacher Motivation</td>
<td>5.35</td>
<td>.59</td>
</tr>
<tr>
<td>Verbal encouraging behavior</td>
<td>63.74</td>
<td>28.49</td>
</tr>
<tr>
<td>Non-verbal encouraging behavior</td>
<td>14.52</td>
<td>9.38</td>
</tr>
<tr>
<td>Student Participation Frequency</td>
<td>50.44</td>
<td>22.2</td>
</tr>
<tr>
<td>Student Participation Variety</td>
<td>4.63</td>
<td>1.51</td>
</tr>
<tr>
<td>Number of students in the class</td>
<td>21.74</td>
<td>7.46</td>
</tr>
<tr>
<td>Years teaching experience</td>
<td>18.85</td>
<td>8.77</td>
</tr>
</tbody>
</table>
REFERENCES


53


