

The Effect of the Teaching Practice on Pre-service Elementary Teachers' Science Teaching Efficacy and Classroom Management Beliefs

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The purpose of this study was to investigate the effect of the teaching practice on pre-service elementary teachers' science teaching efficacy and classroom management beliefs. The subjects were 185 pre-service elementary teachers from two different universities in Izmir. In this study, Science Teaching Efficacy Belief Instrument (STEBI-B) and the Attitudes and Beliefs on Classroom Control (ABCC) instruments were utilized to collect data. Results of the study indicated that almost all pre-service elementary teachers had high self-efficacy beliefs regarding science teaching. In addition, teaching experience did not affect pre-service elementary teachers' science teaching efficacy beliefs. However, pre-service elementary teachers' classroom management beliefs tended to change with the teaching practice. While pre-service teachers' beliefs related to instructional management decrease with teaching practice, their People Management beliefs increase with teaching practice.

Keywords: Pre-Service Elementary Teachers, Science Teaching Efficacy Beliefs and Classroom Management Beliefs

INTRODUCTION

Most educational researches have revealed that most of the elementary teachers have some problems in teaching some subjects. Especially, both pre-service and inservice teachers perceive science as a difficult subject and feel themselves inadequately prepared to teach science in elementary schools. In addition, they lack the confidence to teach science and their self-efficacy regarding to science teaching is very low (Schoeneberger & Russell, 1986; Enochs & Riggs, 1990, Riggs, 1991, Mulholland & Wallace, 2000, Appleton, 2003; Mulholland, Dorman, & Odgers, 2004). Elementary

teachers' attitudes and beliefs about teaching and learning and the pedagogical knowledge garnered from classes and fieldwork play a critical role in shaping their patterns of instructional behavior (Thompson, 1992; Tobin, Tippins, & Gallard, 1994, as cited in Plourde, 2002). The role of teacher efficacy in teaching and learning has been an interest for researchers and practitioners since 1970's. Teacher efficacy has been associated with significant variables such as students' motivation and achievement, teachers' adoption of innovations, teachers' classroom management strategies and time spent in teaching certain subjects (Berman, et al., 1977; Bandura, 1977; as cited in Tschannen Moran, Hoy & Hoy, 1998, Hoy, 2000; Bikmaz, 2004). Teacher efficacy also has positive impacts on teachers' classroom management beliefs and practices (Good, 1981; Bezzina & Butcher, 1990; Ross, 1994; Soodak & Podell, 1994). Classroom management is the aspect of the teaching

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and learning and it seems to be the most common concern of both pre-service and experienced teachers (Johns, MacNaughton, & Karabinus, 1989; Gee, 2001; Weinstein, 1996; Smith, 2000; as cited in, Sokal, Smith, & Mowat, 2003). Successful classroom management is essential for effective instruction and a teacher's belief in his or her ability to positively facilitate student learning may affect classroom management behavior (Henson, 2001). Although classroom management and effective instruction are interrelated with each other, many studies indicated that both pre-service and inservice elementary teachers perceive a lack of connection between the information provided in teacher preparation programs and the real classroom environment (Laut, 1999). Moreover, teachers thought that they were inadequately prepared in handling classroom management and it is a distinctive factor in causing stress (Silvestri, 2001, Youseff, 2003). Furthermore, teachers who self-define their teaching experiences as failures attribute their experiences to a lack of preparation by their teacher education programs.

The development of teacher efficacy and classroom management beliefs among pre-service teachers has been investigated by the many researchers, because once these beliefs are established, they would show resistance to change (Ginns, Tulip, Watters, & Lucas, 1995; Fortman & Pontius, 2000; Lorna, Neelam, & Kyesha, 2002). Pintrich (1990) suggested that teachers' beliefs would ultimately prove to be the most valuable psychological construct to teacher education. There is some evidence that teaching practice affects the classroom management and efficacy beliefs of teachers. Teaching practice provides an opportunity to gather information about pre-service teachers' personal capabilities for teaching and to be tested their beliefs (Katrina, 2004). Although pre-service teachers take theoretical courses about teaching and learning in their education classes, many pre-service teachers may be tarnished when confronted with the realities and complexities of the teaching task. Goodland (1990) comments of the need for teacher educators to realize the likely discrepancy between the ideas of the methods course and the reality of the classroom. In this study, it is aimed to investigate the effect of the teaching practice on pre-service elementary teachers' science teaching efficacy and classroom management beliefs.

Concept of Teacher Efficacy

The teacher efficacy concept has been based on social learning theory of Bandura and his construct of self-efficacy. Bandura (1997) defined perceived self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p.3). Self-efficacy beliefs provide the foundation for human motivation, well-being and

personal accomplishment. This is because unless people believe that their actions can produce the outcomes they desire, they have little incentive to act or to persevere in the face of difficulties (Pajares, 2002). In the Bandura's theory, behavior is based on two sources; outcome expectations and self-efficacy expectations. According to Bandura, outcome expectancy is a given behavior that will lead to certain outcomes. However, self-efficacy expectation defined as a conviction that one can successfully execute the behavior required to produce the outcomes (Savran & Çakıroğlu, 2003). Studies related to measuring of teacher efficacy were started in 1966 by Rotter. Rotter (1966) defined two efficacy items in the teacher efficacy questionnaire: Rand item 1 and Rand item 2. Rand item 1 focused on teachers' beliefs about the power of external factors compared to the influence of teachers and schools and this item was labeled as general teaching efficacy (GTE) which corresponded to Bandura's outcome expectancy. Rand item 2 was more specific and individual than a belief about what teachers in general could accomplish and it was labeled as personal teaching efficacy (PTE) which corresponded to Bandura's self-efficacy expectation (Tschannen Moran, Hoy & Hoy, 1998). Researchers were interested in developing more reliable and comprehensive instruments to measure teachers' efficacy. These instruments are Teachers Locus of Control (TLC) developed by Rose and Medway (1981), Responsibility for Student Achievement (RSA) developed by Guskey (1981) and Webb Scale (WS) developed by Ashton, Olejnik, Crocker, & McAuliffe, (1982). Following these works, Gibson and Dembo developed a broader and more reliable teacher efficacy measurement, which is beginning with the formulation of the Rand studies but bringing to bear the conceptual underpinnings of Bandura. Results of the factor analyses, Gibson and Dembo found same two dimensions of teacher efficacy; one of them is personal teaching efficacy assumed to reflect self-efficacy and the other is general teaching efficacy assumed to capture outcome expectancy (Gibson & Dembo, 1984).

Studies related to measuring teacher efficacy in science teaching and learning have been conducted by some researchers. Riggs and Enochs (1990) developed a questionnaire based on Gibson and Dembo's Teacher Efficacy Scale to measure efficacy of teaching science, which was called Science Teaching Efficacy Belief Instrument (STEBI). Gibson and Dembo developed two useful tools for monitoring teachers' personal science teaching self-efficacy at various stages of their career: Science Teaching Efficacy Belief Instrument-A (STEBI-A) and Science Teaching Efficacy Belief Instrument-B (STEBI-B). STEBI-A is aimed to reveal elementary teachers' self-efficacy beliefs and STEBI-B was designed for pre-service teachers (Ginns & Watters, 1999)

Teachers' Classroom Management Beliefs

Classroom management is the essential factor that deeply affects effective teaching-learning environments and students' achievement. By reviewing literature, it was perceived that some investigators (Smith & Misra, 1992; Colvin, Sugai, & Patching, 1993; Kohn, 1994; Ellis & Karr-Kidwell, 1995; Tauber, 1995; Ellis et al. 1996) seem to consider classroom discipline and classroom management as being synonymous (Youseff, 2003). However, discipline typically refers to structures and rules for student behaviour and efforts to ensure that students comply with those rules (Martin & Yin, 1997; Martin, Yin & Baldwin, 1998; Martin & Shoho, 1999). Classroom management, on the other hand, is defined as a broader, umbrella term that describes all teacher efforts to oversee the activities of the classroom including learning, social interaction, and student behavior (Wolfgang & Glickman, 1980, 1986; Lemlech, 1988; Wolfe, 1988; MacNaughton & Karabinus, 1989; Weinstein & Mignano, 1993; Burden, 1995; Johns, Weinstein, 1996; as cited in Martin, Yin, & Baldwin, 1998). Brophy (1988) defined classroom management as "the actions taken to create and maintain a learning environment conducive to attainment of the goals instruction-arranging the physical environment of the classroom, establishing rules and procedures, maintaining attention to lessons and engagement in academic activities" (p.2). According to Martin and Baldwin (1993), classroom management includes three extensive dimensions; first one is the person dimension which is related to teachers' perceptions of the students as persons and teachers' beliefs about what they can do to help students in developing as individuals. Instruction is the second dimension that includes what teacher can do for enabling students to learn use of time, physical design of the classroom and maintenance of classroom routines etc. The last one, discipline, entails those behaviors that teachers use to set standards for behavior and to enforce those standards (Laut, 1999).

Glickman & Tamashiro (1980) and Wolfgang (1995) examined teachers' beliefs regarding classroom management and discipline and, they put forward three approaches based on child development. These approaches show a continuum from high teacher control to low teacher control. Low teacher control represents noninterventionist models of classroom management. The noninterventionist presupposes that the child has an inner drive that needs to find its expression in the real world. This model focuses on what an individual child does to modify his or her own environment. High teacher control demonstrates interventionist models that emphasize what the outer environment does to the human organism to cause it to develop in its particular way. This approach focuses on environment's effects on the individual. Moderate levels

of teacher control are indicative of an interactionist model of classroom management and presuppose that internal and external forces are constantly interacting. Interactionalists focus on what the individual does to modify the external environment, as well as what the environment in return does to shape the individual (Martin, Yin, & Baldwin, 1998; Laut, 1999; Sokal, Smith & Mowat, 2003).

Classroom management is the one of the most important issues in educational settings and it is needed to investigate the teachers' classroom management beliefs and practices. Researchers attempt to capture multi dimensional aspects of classroom management and for this reason developed some scales. Martin and Baldwin (1993) suggest, "research efforts to explore the effects of classroom management are limited by the quality of instruments presently available to measure teacher perceptions and beliefs" (p. 5). The first instrument to measure teachers' disciplinary approaches and choices is the Pupil Control Ideology (PCI) developed by the Willower, Eidell, & Hoy in 1967. This instrument, based on ideological continuum, is custodial at one extreme and humanistic at the other. Another instrument related to classroom management is the Beliefs on Discipline Inventory (BDI) and it was developed by Wolfgang and Glickman in 1980 (Youssef, 2003). Finally, Martin and Baldwin (1993) developed the Inventory of Classroom Management Styles (ICMS) that addresses the broader concept of classroom management. This instrument was redesigned and recalled as the Attitudes and Beliefs on Classroom Control (ABCC) by Martin, Yin, & Baldwin (1998). ABCC instrument was designed to measure various aspects of teachers' beliefs and attitudes toward classroom management practices. This instrument is based on the three approaches of the classroom management and consists of 26 items and 3 independent dimensions, which are *instructional management*, *people management* and *behavior management*. According to Martin, Yin & Baldwin (1998), instructional management dimension "includes aspects such as monitoring seatwork, structuring daily routines, and allocating materials" (p.7). The second dimension, people management, "pertains to what teachers believe about students as persons and what teachers do to develop the teacher-student relationship" and the behavior management dimension "focuses on preplanned means of preventing misbehavior rather than the teacher's reaction to it" (p.8)

Purpose of the Study

The main aim of the study was to investigate the effect of the teaching practice on pre-service elementary teachers' science teaching self-efficacy and classroom management beliefs.

Research Questions

The research questions for this study as follows:

1. Is there any significant difference between male and female pre-service elementary teachers with regard to their self-efficacy and classroom management beliefs?
2. Is there any significant difference among pre-service elementary teachers who graduated from different types of secondary schools with regard to their self-efficacy and classroom management beliefs?
3. Is there any significant difference between self-efficacy beliefs of pre-service elementary teachers before and after teaching practicum?
4. Is there any significant difference between classroom management beliefs of pre-service elementary teachers before and after teaching practice?

METHOD

Subjects

The subjects of this study were 185 pre-service teachers who were enrolled in two different state universities in Izmir. 42 of pre-service elementary teachers were from Ege University (7 males and 35 females), 143 of them were from Dokuz Eylul University (41 males and 102 females), and the whole were seniors being ready to be teachers in elementary schools.

Instruments

In this study, two instruments were used: Science Teaching Efficacy Belief Instrument (STEBI-B) and The Attitudes and Beliefs On Classroom Control (ABCC) Inventory. A one-group pretest-posttest design was utilized in this study. The STEBI-B and ABCC were administered to pre-service teachers before and after their teaching practice. Researchers visited the classrooms to apply instruments to the students in both two universities.

The Science Teaching Efficacy Belief Instrument (STEBI-B) was developed by Enochs and Riggs in 1990 to measure pre-service elementary teacher's self-efficacy beliefs toward science teaching. According to the Enochs and Riggs (1990), STEBI-B consists of 23 items in a five-point Likert type scale ranging from strongly agree to strongly disagree and has two subscales; *Personal Science Teaching Efficacy* (PSTE) including 13 items and *Science Teaching Outcome Expectancy* (STOE) including 10 items. This instrument is a valid and reliable tool for studying and the items in the self-efficacy subscale and outcome expectancy subscale had high reliability (0.89,

0.76). This instrument was adapted to Turkish by Tekkaya, Çakıroğlu, & Özkan (2002) and it was found that Turkish version of this instrument is valid and reliable. In this study, a factor analysis was conducted to confirm the original factor structure of the instrument developed by Enochs and Riggs. Two items (items 13 and 22) were deleted from instrument because factor loadings were lower than 0.3. Finally, Turkish version of STEBI-B consists of 21 items and PSTE subscale includes 12 items, STOE subscale includes 9 items. Reliability coefficient was calculated as 0.86 for the whole instrument and as 0.80 and 0.72 for the PSTE and STOE subscales respectively.

The Attitudes and Beliefs on Classroom Control (ABCC) inventory is designed to measure teachers' perceptions of their classroom management beliefs and practices. The ABCC Inventory consists of 26 Likert Format statements with a response scale that consists of four categories for each item in the Inventory (Martin & Shoho, 2000). The categories are defined as *Describes Me Very Well*, *Describes Me Usually*, *Describes Me Somewhat*, and *Describes Me Not At All*. Within this inventory, classroom management was defined as a multi-faceted construct that includes three broad dimensions: Instructional Management ($\alpha=0.82$), People Management ($\alpha=0.69$), and Behavior Management ($\alpha=0.69$) (Martin, Yin & Baldwin, 1998). Each subscale was derived to assess a continuum of control ranging from interventionist to interactionist to non-interventionist (Martin & Baldwin, 1993; Martin, Baldwin & Yin, 1995; Martin, Yin & Baldwin, 1997, 1998; Martin & Shoho, 1999, 2000). Higher scores indicate a more interventionist (controlling) approach while lower scores are indicative of a less controlling ideology in that dimension of classroom management style. According to Martin, Yin and Baldwin (1998), ABCC Inventory is a reliable and valid instrument that is useful in the empirical examination of classroom styles.

The ABCC was adapted to Turkish by Savran (2002). It was found that Turkish version of this instrument was valid and reliable. It includes two subscales: the instructional management and the people management. In this study, 26 items of the ABCC instrument were subjected to principal component analysis (PCA) to find underlying structures of the instrument. Principal component analysis revealed the presence of seven factors with eigenvalues exceeding 1. An inspection of the screeplot revealed a clear break after the second factor. To aid in the interpretation of these factors, Varimax rotation was performed. In the two factors structure, three items (items 6, 7 and 17) were deleted from instrument because item-total correlation coefficients were lower than 0.2. Final instrument includes two factors: instructional management factor consists 12 items and explains 13.87 per cent of the variance; people management factor consists of 11 items

and explains 19.78 per cent of the variance. Behavior management subscale, which is the third factor in the original inventory, was failed to be included in the Turkish form. In order to determine reliability of the ABCC instrument, Cronbach alpha coefficient was calculated and it was found that Cronbach alpha of the whole instrument was 0.75. Reliability coefficients of the Instructional Management subscale and the People Management subscale were found to be 0.74 and 0.78, respectively.

RESULTS

Descriptive statistics were conducted to analyze the pre-service teachers' STEBI-B and ABCC scores. As seen in Table 1, the means of pre and post-PSTE scores on STEBI-B for the whole pre-service teachers were 46.16 and 46.31 respectively. Possible minimum score is 12 and maximum score is 60 for the PSTE subscale. These descriptive results can be interpreted as preservice elementary teachers have high personal science teaching efficacy that they have necessary skills to teach science effectively. Pre-service teachers' mean scores for pre-STOE and post-STOE were 32.81 and 32.39 respectively. STOE subscale includes 9 items and

minimum score is 9 and maximum score is 45 for this scale. With regard to subjects' mean scores on the STOE subscale, it can be interpreted that pre-service teachers have high level of science teaching outcome expectancy which student learning can be influenced by given effective instruction. The means of pre and post-Instructional Management subscale on ABBC for the whole sample were found to be 36.07 and 34.83. Instructional management subscale includes 12 item and thus the possible minimum score is 12 (less controlling) and the maximum score is 48 (most controlling). Results indicate that preservice elementary teachers have high scores indicating more controlling, interventionist approach. Pre and post-People Management subscale mean scores of pre-service teachers were 34.51 and 35.26 respectively. For the People Management subscale, the possible minimum score is 11 and maximum score is 44. Results showed that preservice elementary teachers also tend to be more interventionist on this scale.

An independent t-test was used to determine if there was any significant difference between male and female pre-service elementary teachers with regard to their self-efficacy and classroom management beliefs before and after teaching practice. As seen in Table 2, there was no

Table 1. Descriptive Statistics of STEBI-B and ABCC Scores

Variable	N	Minimum	Maximum	Mean	Sp
Pre-PSTE	185	24,00	60,00	46,16	6.26
Post-PSTE	185	26,00	60,00	46,31	6.31
Pre-STOE	185	21,00	44,00	32,81	4.33
Post-STOE	185	18,00	45,00	32,39	4.69
Pre-Instructional Management	185	25,00	46,00	36,07	3.85
Post-Instructional Management	185	16,00	45,00	34,83	4.06
Pre-People Management	185	21,00	44,00	34,51	3.98
Post-People Management	185	23,00	44,00	35,26	3.89

Table 2. t-Tests: Males –Females Regarding STEBI-B and ABCC

Subscale	Gender	N	Mean	SD	df	p
Pre-PSTE	Female	137	45,95	6,42	183	.451
	Male	48	46,75	5,81		
Post-PSTE	Female	137	46,21	6,37	183	.712
	Male	48	46,60	6,21		
Pre-STOE	Female	137	32,73	4,37	183	.662
	Male	48	33,04	4,28		
Post-STOE	Female	137	32,10	4,79	183	.152
	Male	48	33,23	4,31		
Pre-Instructional Management	Female	137	35,89	4,01	183	.285
	Male	48	36,58	3,34		
Post-Instructional Management	Female	137	34,66	3,86	183	.342
	Male	48	35,31	4,58		
Pre-People Management	Female	137	34,63	4,05	183	.465
	Male	48	34,14	3,78		
Post-People Management	Female	137	35,46	3,91	183	.215
	Male	48	34,67	3,58		

significant difference between the mean scores of males and females' science teaching efficacy and classroom management beliefs ($p > .05$).

A one-way between groups analysis of variance was conducted to explore the different types of secondary schools on pre-service elementary teachers' self efficacy and classroom management beliefs. There was no significant difference between the mean scores of pre-service elementary teachers who graduated from different types of secondary schools with regard to their science teaching efficacy and classroom management beliefs ($p > .05$) (Table 3).

A paired-samples t-test was conducted to evaluate the impact of the teaching practice on self efficacy and classroom management beliefs of pre-service elementary teachers. As seen in Table 4, mean scores on STEBI-B for PSTE subscale changed from 46.16 to 46.31, indicating an increase of 0.15. There was no statistically significant difference between the pre-test (before teaching practice) and post-test (after teaching practice) means on the PSTE sub-scale. Mean scores on STEBI-B for STOE changed from 32,80 to 32,39, indicating a

decrease of 0.41. There was no statistically significant difference between pre-test and post-test means of STOE ($p > .05$). However, there was a statistically significant difference in ABCC scores of the each subscales before teaching practice to after teaching practice ($p < .05$). Mean scores of Instructional Management subscale changed from 36.07 to 34.83, a indicating decrease of 1,24 and mean scores of People Management subscale changed from 34.51 to 35.26, indicating an increase of 0.25.

DISCUSSION

Classroom management and teacher efficacy beliefs of pre-service teachers have been shown to be the most common concern of the educational studies (Weinstein & Mignano, 1993; MacNaughton & Karabinus, 1989; Weinstein, 1996; Smith, 2000; Gee, 2001). These beliefs that pre-service teachers have about how to manage their classes and how effectively they might be are interrelated with each other. These beliefs also affect teachers' perceived success before entering the teaching

Table 3. ANOVA Tests: Different Types of Secondary Schools Regarding STEBI and ABCC

Variable	Source	Sum of Squares	df	Mean Square	F	p
Personal Science Teaching Efficacy	Between Groups	226,060	6	37,677	,938	.469
	Within Groups	7111,657	177	40,179		
	Total	7337,717	183			
Science Teaching Outcome Expectancy	Between Groups	65,045	6	10,841	,483	.821
	Within Groups	3975,384	177	22,460		
	Total	4040,429	183			
Instructional Management	Between Groups	75,316	6	12,553	,420	.865
	Within Groups	2944,424	177	16,635		
	Total	3019,739	183			
People Management	Between Groups	176,662	6	29,444	2,057	.061
	Within Groups	2533,289	177	14,312		
	Total	2709,951	183			

Table 4. Paired Sample t-Test (Two-Tailed) Results for STEBI and ABCC

Variable	Tests	N	Mean	SD	t	df	p
Personal Science Teaching Efficacy	Pre-test	185	46,16	6,2620	-,311	184	.756
	Post-test	185	46,31	6,3150			
Science Teaching Outcome Expectancy	Pre-test	185	32,80	4,3357	1,112	184	.267
	Post-test	185	32,39	4,6893			
Instructional Management	Pre-test	185	36,07	3,8519	3,437	184	.001*
	Post-test	185	34,83	4,0565			
People Management	Pre-test	185	34,51	3,9783	-2,550	184	.012*
	Post-test	185	35,26	3,8388			

* $p < 0.05$

field. The most important factor, which affects or change pre-service teachers' beliefs is the teaching practice experience. Teaching practice is the event in a pre-service teacher's educational career that warrants the application of that theoretical knowledge and transforms the "pre-service teacher" to "real teachers" (Katrina, 2004). This experience give opportunities for pre-service teachers to apply their content and pedagogical knowledge with children and to further develop personal teaching philosophies (Plourde, 2002).

In this study, the effects of the teaching practice on pre-service elementary teachers' science teaching efficacy and classroom management beliefs were examined. Firstly, the differences between the science teaching efficacy and classroom management beliefs of pre-service elementary teachers with regard to gender were investigated. Results revealed no significant differences in both self-efficacy and classroom management scores between males and females pre-service teachers. These findings are consistent with the other studies conducted in Turkey (Celep, 2001; Savran, 2002; Gencer & Çakıroğlu, 2007). However, there is no consistency among the results of the other studies in this field. In terms of science teaching efficacy beliefs, some researchers found that female teachers had lower science teaching self-efficacy beliefs than their male counterparts before teaching practice. However, after teaching practice, there was no statistically significant difference in preservice male and female teachers' self-efficacy beliefs. According to these researchers, methods courses in teacher education programs focus on preservice teachers' own experiences with science and past education inequities and female teachers need support to change their beliefs about self-efficacy regarding teaching science. (Riggs, 1991; Brandon, 2000; Howes, 2002; Kiviet & Mji, 2003; Mulholland et al., 2004). Studies related to classroom management regarding gender revealed that males scored significantly higher (more interventionist) on each subscales of the ABCC. That is males are more controlling, authoritarian, interrupting, impolite, assertive, aggressive and dominant than their female counterparts (Martin & Yin, 1997).

In this study, when it was examined whether or not the effects of pre-service elementary teachers graduating from different types of high school with regard to their science teaching efficacy and classroom management beliefs, it was found that this variable did not affect these beliefs. This could be explained as these pre-service teachers were senior, and for this reason, it has been a long time since they had their high school experiences. That means, pre-service elementary teachers' self-efficacy and classroom management beliefs were influenced by experiences from undergraduate courses.

The analyzing of the effects of the teaching practice on pre-service elementary teachers' self-efficacy and classroom management beliefs, teachers put forth very interesting results for consideration. As seen from the analyses, there were no significant differences between PSTE and STOE mean scores of pre-service teachers both before and after teaching practice. Results seem to indicate that teaching practice did not affect their science teaching efficacy beliefs. Similar to this study, Gencer & Çakıroğlu (2007) found that completing teaching practice course and additional educational courses were not a significant factor on preservice teachers' self-efficacy beliefs. According to Ginns and Watters (1999), the lack of significant difference in PSTE scores could be attributed to preservice teachers' beliefs and attitudes regarding the teaching of science which were set firmly prior to entry into preservice program as a result of their science-related experiences in elementary and high schools (Plourde, 2002). On the other hand, Tosun (2000) indicated that the lack of change in outcome expectancy scores is related to Bandura's (1977) four sources of efficacy information (performance accomplishment, vicarious experience, verbal persuasion, emotional arousal). Bandura (1981) suggested the need for successful mastery experiences to enhance self-efficacy. The results suggest that a lack of performance accomplishment in prior science coursework may have translated into little change in outcome expectancy. However, research conducted in this area to date indicates that teaching practice experiences affect preservice teachers' efficacy beliefs either positively or negatively. Studies related to STEBI-B reported mixed results in terms of significant changes in the two subscales, self-efficacy (PSTE) and outcome expectancy (STOE) (Ginns, Tulip, Watters & Lucas, 1995; Plourde, 2002; Bleicher & Lindgren, 2005). For example, Wingfield et al. (2000) found significant changes in both self-efficacy and outcome expectancy. Cantrell, Young, and Moore (2003), Schoon and Boone (1998), and Tosun (2000) found significant changes in self-efficacy, but not in outcome expectancy. However, Ginns, Tulip, Watters & Lucas (1995) and Plourde (2002) found significant changes only in outcome expectancy. Tschannen-Moran and Woolfolk Hoy (2001) argued that discrepancies in these findings could be related to the way efficacy was measured. Hoy and Woolfolk (1990) postulated that a significant phase of socialization begins when students enter the actual world of teaching as practice teaching. The suggestions of Ashton and Webb (1986) that perceived efficacy may be high for certain tasks when students enter the teacher education program, but decrease as students encounter difficulties with the task. Perhaps increase with successful experiences, and decrease again if additional complexity is added to the task may, in part, account for the results (Ginns et al., 1995).

Statistical analyses related to preservice teachers' classroom management beliefs changes before and after teaching practice revealed that there was a statistically significant difference on both Instructional Management and People Management subscales of the ABCC inventory with regard to teaching experience. While pre-service teachers' beliefs related to instructional management decrease with teaching practice, their People Management beliefs increase with teaching practice. Pre-service students' instructional management beliefs partially tend to shift interventionist to interactionist approach. However, their people management beliefs became more interventionist through the teaching experience.

These findings suggest that pre-service teachers' educational experiences during their teaching practice affect their attitudes toward classroom management. This is also consistent with the other studies that how teaching practice experiences affect the pre-service teachers beliefs. Research has demonstrated that effective classroom instruction in teacher education programs can alter students' views about classroom management (Hollingsworth, 1989). More often, however, student teachers begin their traditional teacher education programs with well-defined ideas about classroom management and these ideas remain unchanged during the course of their training (Zeichner & Tabachnick, 1981; O'Loughlin, 1991; Tatto, 1996). Ironically, changes occur when these teachers are hired for their first teaching positions (Celep, 1997; Laut, 1999). At this point, their attitudes usually become more interventionist.

According to Sokal, Smith, & Mowat (2003), it is unclear exactly where on the continuum that the transition between interactionist and interventionist attitudes becomes problematic. Moreover, studies resulted in student teachers become more interventionist in one component of classroom management and less so in another create more questions. When designing teacher education programs, which types of classroom management beliefs should be the focused are still unanswered.

CONCLUSION

This study is only a step to understand pre-service elementary teachers' science teaching efficacy and classroom management beliefs. In order to analyze and understand the modification in teacher's beliefs, longitudinal studies that preservice teachers can be observed through the 4-years teacher education programs must be conducted. In addition, future studies using qualitative methods would enhance our understanding of pre-service teachers' potential differences in students' interpretation of experiences as well as differences among experiences themselves self-

efficacy and classroom management beliefs. The findings of this study can help to develop and improve teacher education programs and pre-service teaching practices. Teacher education programs must be designed to bridge the gap between theory and practice and to better prepare these teachers. In order to enhance pre-service teachers' science teaching efficacy beliefs, they are encouraged to observe and involve variety of science experiences during their field experiences. It is no doubt that, field experiences provided the pre-service teacher a number of new experiences in the classroom. Hence, field experiences are needed to include efficient lesson planning and effective classroom management. A better understanding of the self-efficacy and classroom management beliefs of pre-service teachers will facilitate the process of university level instruction.

REFERENCES

- Ashton, P. T., Olejnik, S, Crocker, L. & McAuliffe, M. (1982, April). *Measurement problems in the study of teachers' sense of efficacy*. Paper presented at the annual meeting of the American Educational Research Association, New York.
- Appleton, K. (2003). How do beginning primary school teachers cope with science? Toward an understanding of science teaching practice. *Research in Science Education*, 33, 1–25.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.
- Bezzina, M., & Butcher, J. (Eds.). (1990). Teacher efficacy and classroom management beliefs. In *The changing face of professional education*. Collected papers of the Australian Association for Research in Education annual conference (pp. 91-98). North Ryde, NSW: Australian Association for Research in Education.
- Bleicher, R. E. & Lindgren, J. (2005). Success in science learning and preservice science teaching self-efficacy. *Journal of Science Teacher Education*, 16, 205–225.
- Brandon, D. P. (2000). Self-efficacy: Gender differences of prospective primary teachers in Botswana. *Research in Education*, No:64.
- Brophy, J. (1988). Educating teachers about managing classrooms and students. *Teaching and Teacher Education*, 4(1), 1-18.
- Celep, C. (2000). The Correlation of the factors: The prospective teachers' sense of efficacy and beliefs and attitudes about students control. *National Forum of Teacher Educational Administration and Supervision Journal*, 17E (4).
- Enochs, L. G. & Riggs, I. M. (1990). Further development of an elementary science teaching efficacy belief instrument: A preservice elementary scale. *School Science & Mathematics*, 90, 694–706.
- Fortman, C. K. & Pontius, R. (2000, October). *Self efficacy during student teaching*. Paper presented at the annual meeting of the Mid Western Educational Research Association. Chicago, IL (ERIC Document Reproduction Service No. ED 447103).

- Gencer, A. S. & Çakıroğlu, J. (2007). Turkish preservice science teachers' efficacy beliefs regarding science teaching and their beliefs about classroom management. *Teaching and Teacher Education*, 23 (5), 664–675.
- Gibson, S., & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, 76, 569-582.
- Ginns, I. S, Tulip, D.F, Watters, J. J, & Lucas, K. B.(1995). Changes in pre-service elementary teachers' sense of efficacy in teaching science. *School Science and Mathematics*. 95, 394–400.
- Ginns, W. &Watters, J.(1999). Beginning elementary school teachers and the effective teaching of science. *Journal of Science Teacher Education*, 10(4), 287-313.
- Glickman, C.D. & Tamashiro, R.T. (1980). Clarifying teachers' beliefs about discipline. *Educational Leadership*, 37, 459- 464.
- Good, T. (1981). Teacher expectations and student perceptions: A decade of research. *Educational Leadership*, 38(5), 415-422.
- Henson, R. K. (2001). *Relationships between preservice teachers' self-efficacy, task analysis, and classroom management beliefs*. Paper presented at the annual meeting of the Southwest Educational Research Association, New Orleans, LA.
- Howes, E. V. (2002). Learning to teach science for all the elementary grades: What do preservice teachers bring. *Journal of Research in Science Teaching*, 39, 845–869.
- Hoy, A. W. (2000, April). *Changes in teacher efficacy during the early years of teaching*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Johns, A., MacNaughton, R.H., Karabinus, N.G. (1989). *School discipline guidebook: Theory into practice*. Boston: Allyn & Bacon.
- Katrina, M. (2004). *Lessons learned: Reflecting back on student teaching*. Unpublished Master Thesis, Department of Middle and Secondary Education, The Florida State University College of Education. Retrieved October 16, 2006, from <http://etd.lib.fsu.edu/theses/available/etd-05052004-204003>
- Kiviet AM, Mji A. (2003). Sex differences in self-efficacy beliefs of elementary science teachers. *Psychological Reports*, 92(1), 333-8.
- Laut, J. (1999). *Classroom management: Beliefs of pre-service teacher and classroom teachers concerning classroom management styles*. Paper presented at the Fall Teachers Education Conference, Charleston, SC.
- Lin, H., & Gorrell, J. (2001). Exploratory analysis of pre-service teacher efficacy in Taiwan. *Teaching and Teacher Education*, 17, 623–635.
- Lorna, L. G., Neelam, K. & Kyesha, B. (2002, April). *Preservice teachers' knowledge of effective classroom management strategies: Shy or withdrawn students*. Paper presented at the Annual Meeting of the Educational Research Association, New Orleans, LA, (Eric Document Reproduction Service No. ED 465748).
- Martin, N. K., & Baldwin, B. (1993). Validation of an inventory of classroom management style: Differences between novice and experienced teachers. *Paper presented at the annual meeting of the American Educational Research Association*, Atlanta, GA.
- Martin, N. K., & Yin, Z. (1997). Attitudes and beliefs regarding classroom management style: Differences between male & female teachers. *Paper presented at the annual meeting of the Southwest Educational Research Association*, 20th, Austin, TX, January (Eric Document Reproduction Service No. ED 404738)
- Martin, N. K., Yin, Z., & Baldwin, B. (1998). Construct validation of the attitudes and beliefs classroom control inventory. *Journal of Classroom Interaction*, 33 (2), 6- 15.
- Martin, N. K. & Shoho, A. R. (1999, April). *Beliefs regarding classroom management style: differences between traditional and alternative certification teachers*. Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Quebec, Canada (Eric Document Reproduction Service No. ED 432544)
- Mulholland, J., & Wallace, J. (2000). Beginning elementary science teaching: Entryways to different worlds. *Research in Science Education*, 30, 151– 171.
- Mulholland, J., Dorman, J. P. & Odgers, B. M. (2004). Assessment of Science Teaching Efficacy of Preservice Teachers in an Australian University. *Journal of Science Teacher Education* 15(4): 313–331.
- Pajares (2002). Overview of social cognitive theory and of self-efficacy. Retrieved October 6, 2006, from <http://www.emory.edu/EDUCATION/mfp/eff.html>
- Pintrich, P. R. (1990). Implications of psychological research on student learning and college teaching for teacher education. In W. R. Houston (Ed.), *Handbook of research on teacher education* (pp. 826–857). New York: Macmillan.
- Plourde, L. A. (2002). The influence of student teaching on preservice elementary teachers' science self-efficacy and outcome expectancy beliefs. *Journal of Instructional Psychology*, 29(4), 245-253.
- Riggs, I. M., and Enochs L. G. (1990). Toward the development of an elementary teacher's science teaching efficacy belief instrument. *Science Education*. 74 (69), 625-637
- Riggs, I. M. (1991, April). *Gender differences in elementary science teacher self-efficacy*. Paper presented at the annual meeting of the American Educational Research Association, Chicago IL (ERIC document ED 340705).
- Ross, J. A. (1994). Beliefs that make a difference: The origins and impacts of teacher efficacy (Eric Document Reproduction Service No. ED 379 216).
- Savran, A. (2002). *Pre-service science teachers' efficacy beliefs regarding science teaching and their classroom management beliefs*. Unpublished Master Thesis, Middle East Technical University, Ankara.
- Savran, A., & Cakiroglu, J. (2003). Difference between elementary and secondary pre-service science teachers' perceived efficacy beliefs and their classroom management beliefs. *The Turkish Online Journal of Educational Technology*, 2(4).
- Schoeneberger, M., & Russell, T. (1986). Elementary science as a little added frill: A report of two case studies. *Science Education*, 70, 519–538.
- Silvestri, L. (2003). The Effect of Attendance on Undergraduate Methods Course Grades. *Education*, 123 (3), 483-487. Retrieved December 23, 2006, from http://www.findarticles.com/p/articles/mi_qa3673/is_200304/ai_n9232366

- Smith, B. (2000). Emerging themes in problems experienced by student teachers: A framework for analysis. *College Student Journal*, 34(4), 633-641.
- Sokal, L, Smith, D. G. & Mowat, H. (2003). Alternative certification teachers' attitudes toward classroom management. *High School Journal*, 86 (3), 8-16.
- Soodak, L.C., & Podell, D. M. (1994). Teachers' thinking about difficult-to-teach students. *Journal of Educational Research*, 88 (1), 44-51.
- Tekkaya, C., Çakıroğlu, J. & Özkan, Ö. (2002). Turkish preservice science teachers' understanding of science, self efficacy beliefs and attitudes toward science teaching. NARST 2002 (National Association for Research in Science Teaching), New Orleans, USA.
- Tosun, T. (2000). The impact of prior science course experience and achievement on the science teaching self-efficacy of preservice elementary teachers. *Journal of Elementary Science Education*, 12(2), 21-31.
- Tschannen-Moran, M., Hoy, A. W. & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, 68, 202-248.
- Wolfgang, C. (1995). *Solving discipline problems: Strategies for classroom teachers*. Boston: Allyn & Bacon.
- Youseff, G. (2003). *An Investigation into the influences of teachers' classroom management beliefs and practices on classroom procedures*. Paper presented at Association for Research in Education. Retrieved October 16, 2006, from www.aare.edu.au/03pap/you03353.pdf

