A CROSS CULTURAL COMPARISON OF TEACHER AND SCHOOL RELATED FACTORS WHICH EXPLAIN SELF EFFICACY OF MIDDLE SCHOOL MATHEMATICS TEACHERS

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ABSTRACT

A CROSS CULTURAL COMPARISON OF TEACHER AND SCHOOL RELATED FACTORS WHICH EXPLAIN SELF EFFICACY OF MIDDLE SCHOOL MATHEMATICS TEACHERS

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In the present study, the self-efficacy of Turkish and American middle school mathematics teachers was compared and consequently factors that explain self-efficacy measures were studied within each cultural context. The variables considered were (i) teacher related factors such as teacher-teacher respect, collective efficacy, use of tools, de-privatization, teacher-teacher feedback and collaboration and (ii) school related factors such as principal feedback to teacher, principal assist to teacher, teacher trust to principal, instructional leadership, teacher accountability to principal. Survey data were collected from 245 American, 379 Turkish in-service middle school mathematics teachers by the use of Middle-school Mathematics and

the Institutional Setting of Teaching (MIST) scale. Construct and item level equivalencies were studied as a-priory analyses. Even though two-dimensional structure of the self-efficacy measure was verified, there were differences in the structure of the teacher and school related factors across the countries compared. Thus, the regression analyses were carried out separately within each country. There were significant mean differences in the mathematics teachers' self-efficacy in the dimensions of classroom management strategies and student support strategies across Turkish and American samples in favor of the Turkish mathematics teachers. In the regression models, there were some differences with respect to the prediction of self-efficacy measures of teachers across the countries. On the other hand, in both cultures, collective efficacy of teachers and instructional leadership were found to be important predictors of self-efficacy.

Keywords: Self-efficacy, in-service, mathematics teachers, school related factors, teacher related factors, cross-cultural, USA, Turkey

ÖZ

MATEMATİK ÖĞRETMENLERİNİN ÖZ-YETERLİKLERİNİ AÇIKLAYAN ÖĞRETMEN VE OKUL KAYNAKLI BOYUTLARININ KÜLTÜRLER ARASI KARŞILAŞTIRMASI

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Bu çalışmada Türk ve Amerikan ortaokul matematik öğretmenlerinin öz-yeterlikleri karşılaştırılmıştır ve öz-yeterlik ölçümlerini açıklayan yapılar her kültür içerisinde çalışılmıştır. Değişkenler: (i) Öğretmen ile ilgili yapılar: öğretmen-öğretmen saygı, bütünsel öz-yeterlik, kullanılan araçlar, özelleştirme, öğretmen-öğretmen geri bildirim ve işbirliği ve (ii) okul ile ilgili yapılar: yöneticinin öğretmene geri-bildirimi, yöneticinin öğretmene yardımı, öğretmenin yöneticiye güveni, öğretimsel liderlik, öğretmenin yöneticiye hesap verilebilirliktir. Anket verileri 245 Amerikan, 379 Türk ortaokul matematik öğretmeninden Middle-school Mathematics and The Institutional Setting of Teaching (MIST) anketi kullanılarak toplanmıştır. Yapı ve madde bazındaki eşitlikler ön analizler olarak yapılmıştır. 2 boyutlu öz-yeterlik anketinin yapısı doğrulanmıştır fakat öğretmen ve okul kaynaklı faktörlerin ülkeler

arası karşılaştırılmasında farklılıklar vardır. Son olarak, regresyon analizleri her bir ülke için ayrıca yapılmıştır. Matematik öğretmenlerinin ortalama öz yeterlikleri sınıf yönetimi stratejileri ve öğrenci destelenme stratejileri boyutlarında Türkiye ve Amerika örneklenmelerinde Türk matematik öğretmenlerinin lehine yönde farklılıklar göstermektedir. Regresyon modellerinde, ülkeler arasında öz-yeterlik ölçümlerinin tahmin edilmesinde farklılıklar vardır. Diğer taraftan, her iki kültürde de öğretmenlerin bütünsel yeterliği ve öğretimsel liderlik öz-yeterlik boyutunun kayda değer tahmin edicileridir.

Anahtar Kelimeler: Öz yeterlilik, Hizmet-içi, Matematik Öğretmeni, Öğretmen bağımlı değişkenler, okul bağımlı değişkenler, kültürler arası karşılaştırma, Amerika, Türkiye

To my father and mother

Yusuf & Belgüzar Sevgi

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NCTM: National Council of teachers of Mathematics Teachers

OECD: Organization of Economic Cooperation and Development

MIST: Middle-school Mathematics and the Institutional Setting of Teaching

TSES: Teachers Sense of Self-efficacy Scale

TPTO: Teachers Perceptions of Themselves and Others

TPSA: Teachers Perceptions about School Administration

EFA: Exploratory Factor Analysis

MANOVA: Multivariate Analysis of Variance

USA: United States of America

TR: Turkey

MoNE: Ministry of Education

CHAPTER 1

INTRODUCTION

In today's world, societies' expectations from schools become more demanding in order to keep up with the rapidly growing body of knowledge and the competitive nature of the globalized economy. Students need to be prepared in such a way that they can deal with the existing domain of information they encounter in their daily life, but they also have to keep learning over their lifetime. Therefore, schools have greater responsibility in educating individuals who are capable of dealing with challenging situations in a society which requires basic competencies for being an effective citizen. The Organization for Economic Co-operation and Development (OECD) defined the competencies for being an effective citizen (OECD, 1999). In OECD's perspective, students are supposed to be educated to deal with every-day challenges, which require basic competencies in cognitive processes through the basic concepts they gain in language, mathematics and science curricula. Among these three subject matter areas, mathematics needs to be emphasized, since almost in every country, competencies in mathematics are always questioned (PISA, 2012). Thus, schools have the greatest responsibility in educating competent individuals especially in mathematics since today's world requires at least basic mathematical skills to deal with the challenges one may encounter in daily life situations.

The school system has a rather dynamic nature with all the interactions among the school principals, teachers and students. Teachers on the other hand, have the key

roles since they deal with the school principals and school policy implementations as well as conducting effective instructional practices in classrooms. Effective instruction requires planning instructional activities with other teachers through the collaborative support of school principals. These are all defined as teachers' competencies (NCTM, 2006; MoNE, 2006, 2008). Literature reveals that teachers' competencies are directly related to students' mathematics achievement (Hill, Rowan & Ball, 2005; Wayne and Youngs, 2003). To improve students' mathematics achievement through effective instruction, the competencies of mathematics teachers were considered seriously across countries. For instance, in Turkey, the mathematics teachers' competencies were clearly described by the Ministry of National Education (MoNE, 2006; MoNE, 2008). Similarly, in the USA the National Council of Teachers of Mathematics defined competencies which were specific to mathematics teachers (NCTM, 2014). There are overlapping descriptions between the two countries even though the Turkish and American educational systems are quite different in terms of educational practices. When compared, across two educational systems planning and implementing effective instruction, developing socially, emotionally and academically safe environments, evaluating curricular materials and resources, incorporating mathematical tools within classroom activities, providing students with accurate and timely feedback on assessment, working collaboratively with colleagues could be seen as overlapping competencies which clearly point out the importance of common cross-cultural expectations from mathematics teachers (NCTM, 2014, MoNE, 2008).

In both countries, the expected competencies of mathematics teachers depend on the constructivist approach (NCTM, 2000; MoNE, 2008). As it is well known among educators, the constructivist approach requires elaborate teacher qualifications especially in implementing the effective instruction. As was explained before in both countries, NCTM and MoNE describe competencies for effective instruction which have common key components. These competencies are rather considered as hard to achieve in a standard school system (Katterfeld, 2013) since teachers effective instruction is affected by external factors. The external factors are whether the teacher acts cooperatively with other teachers and executing the courses of action required to produce given attainments given by school administration. Teachers'

perception about themselves, their interaction with the other teachers, and their beliefs about the school administration seem to be influential on the school environment. It seems that obtaining knowledge about how teachers feel about their capacities in line with effective instruction is a prerequisite objective to achieve successful school system. This is defined as teachers' self-efficacy, and teachers with a high level of self-efficacy about themselves foster positive students' learning in the classroom (Ashton & Webb, 1986; Gibson & Dembo, 1984; Ross, 1992; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Bandura (1977) defines self-efficacy as "judgments about capabilities to organize and execute the courses of action required to produce given attainments in specific situations or contexts" (p.3). Tschannen - Moran and Woolfolk-Hoy (1998) identify three components of self-efficacy: (1) a teacher's judgment of his or her capabilities to bring about desired outcomes of student engagement even students are unmotivated to learn, (2) instructional strategies as alternative teaching strategies and (3) classroom management for disruptive behaviors.

Components of teachers' self-efficacy may be related to their instructional activities in the classrooms and interaction with other teachers and interaction with school administration (Hoy & Spero, 2005). When all of these interactions are considered as a part of healthy school environment, there are teacher-related factors that might have impact on teachers' self- efficacy, such as how teachers indicate respect to other teachers in school, how teachers feel about organizing and executing given attainments by school administration, how much they cooperate with other teachers through sharing materials, how much they use educational resources and tools such as textbooks, how much they provide feedback to other teachers in school, and how much they cooperate to use instructional strategies effectively.

On the other hand, there are also administrative related factors in a healthy school environment. For instance, how much teachers get feedback from their principals, how much principals assist to teachers, how much teachers indicate trust in their principals, how they get instructional leadership from their principals and how much they are accountable to principals might be influential on teachers' self -efficacy.

In the literature, there are studies about the factors that are effective on teachers' self-efficacy. Teachers' healthy relation with other teachers in a school setting, which is considered as teacher respect seems positively related to self -efficacy of teachers (Da Costa & Riordan, 1996; Hoy, Sweetland, & Smith, 2002). Similarly, teachers' beliefs about shared capability of their school as a whole about organizing and executing required attainments for effective mathematics instruction were defined as collective efficacy (Bandura, 1997; Goddard, Hoy, & Woolfolk Hoy, 2000; Hoy, Sweetland, & Smith, 2002). Collective efficacy is also positively but moderately related to teachers' self-efficacy (Bandura, 1997; Goddard & Goddard, 2001; Kurz & Knight, 2004; Goddard, Hoy, & Woolfolk Hoy, 2000; Tschannen-Moran, Barr, 2004). In line with effective instructional process, teachers who strive for choosing the most appropriate tool to teach the subject matter in the classroom such as the most suitable textbook or instructional materials have more self-efficacy about themselves. Cohen, Raudenbush, and Ball (2003) reported a positive relation between the use of appropriate instructional materials and self-efficacy of teachers. When considered as a social system, teachers' supportive manner to each other in producing new ideas for effective instruction and coordinating instructional activities create a positive climate in a healthy school system and enhance teachers' self-efficacy. Teachers' positive perception about the supportive environment in school was found to be related to their self-efficacy (Kruse, Louis, & Bryk, 1995; Hord & Sommers, 2008; McLaughlin & Talbert, 2001; Wahlstrom, Louis, 2008). When positive and supportive environments are established in a school system, teachers' interaction is enhanced in a way to improve the instructional activities. Within this framework, the feedback mechanism in school is also a part of positive school climate. For instance, teachers' feedback to other teachers based on class observation is strongly recommended in a healthy school environment. In fact, this practice has positive effect on teachers' self-efficacy (Frase, 2001; Louis & Marks, 1998; Tschannen-Moran & Hoy, 2001; Yair, 2000). Most probably, in a school system where teachers have respect to each other and support the other colleagues based on a healthy feedback system there are cooperation among teachers in sharing instructional strategies and supporting students' activities for effective learning. Teachers' cooperation with their colleagues about instructional strategies and

activities for supporting students learning initiate increased self-efficacy among teachers as found out by researchers (Little, 2003; Wahlstrom, Louis, 2008; Courneva, 2008; Louis &Marks, 1998; Tschannen-Moran & Hoy, 2001).

Teachers' perception about school administration and its' relation to their self-efficacy were also studied in the literature. School principals' detailed feedback about instruction in classroom setting was found to be related to self-efficacy of teachers (Freedman, 2003; Fullan, 1995; Glickman, 2002). It is not only the principal's feedback about the classroom activities which are effective for enhancing self-efficacy of teachers, but their assistance about developing instructional strategies, supporting students' engagement in instructional activities and classroom management were also found to be effective (Wahlstrom, Louis, 2008; Nelson, Sassi, 2005). Teachers' relation with school principal develops a trust between teachers and school administration through which teachers think that school administration has respect for them and naturally teachers feel supported in their efforts to develop effective instruction. Thus, teachers' trust on school principal is a part of positive school climate and was related to positive self-efficacy of teachers (Hoy and Woolfolk, 1993; Moore and Esselman, 1994; Wahlstrom, Louis, 2008). The school principals' role is not restricted only to the establishment of respect between teachers and school administration, but principals' act as an instructional leader in developing plan for implementing instructional strategies in classroom and at the same time monitor the students' academic progress. Teachers' self-efficacy increases when their principals' instructional leadership behaviors were understood by teachers (Hipp, 1996; Blase, Blasé, 2000; Barnett & McCormick, 2004; Leithwood & Montgomery, 1982; Walker, Slear, 2011; Dee, Henkin, & Duemer, 2003, Marzano, 2005, Nelson & Sassi, 2005; Dale, Philips, Sianjina, 2011; Katterfeld, 2013). Teachers' accountability to school principals about instructional activities and determining students' needs related to learning tasks is another important factor to be considered within a school system. Teachers with high self-efficacy beliefs felt themselves accountable to their principals about instructional practices in their classrooms (Wahlstrom, Louis, 2008).

As it is seen from the literature, teachers' self-efficacy is affected from school environment where, teachers develop different perceptions about themselves, other teachers in school and school administration. For effective educational practices and education policy decisions, enhancing teachers' self-efficacy is a necessity for improving students' learning (Tschannen-Moran, Hoy, & Hoy, 1998). Thus, factors which are related to self-efficacy of mathematics teachers become even more crucial, since low mathematics achievement is a widespread problem across the countries. Moreover, school environment is not independent from the cultural settings of countries. Self-efficacy and the factors related to self-efficacy of mathematics teachers in a cross-cultural context are worth studying for an effective education policy decisions about productive school environment. Studying mathematics teachers' self-efficacy in cross-cultural perspective may give more insight about what to consider in a school setting in general independent of cultural specific differences as well as within culture specific environment.

Teacher's self-efficacy may be influenced by the unique features of cultures (Çakıroğlu, 2008). To analyze the effect of cultures, teachers' self-efficacy was studied in cross-cultural settings by various researchers (Dimmock & Walker, 1998; Hallinger & Leithwood, 1998; Heck, 1998; 1996; Klassen, Tze, Betts, & Gordon, 2011; Chong, Klassen, Huan, Wong, & Kates, 2010; Klassen & Chiu, 2010; Klassen et. al., 2009; Ho & Hau, 2004; Klassen, 2004). Çakıroglu (2008) found that Turkish pre- service teachers be likely to have a stronger self-efficacy that teaching can influence student learning when compared with American pre-service teachers. Rich, Lev and Fisher (1996) indicated that the factorial structure of Israeli teachers' self-efficacy scale was the same as with the American teacher self- efficacy. In general, teachers' self-efficacy were found to be important to report in line with teacher related factors and school related factors. Even though there were cross-cultural attempts to compare mathematics teachers' self-efficacy, no study considered teacher and school related factors and their relation to self-efficacy in a cross-cultural setting. Thus, in the present study, it is aimed to investigate mathematics teachers' self-efficacy along with teacher and school related factors across Turkey and the USA. As it is stated above, the research studies point out the importance of teacher-teacher respect, collective efficacy, teachers' interaction with each other to support and

coordinate instructional materials, use of instructional tools, teacher feedback to each other and collaboration among mathematics teachers as teacher related factors which could be influential on teachers' self-efficacy. On the other hand, some school administration related factors such as principal feedback to teacher, principal assist to teacher, teacher accountable to principal, teacher trust in principal and principals' instructional leadership could also be considered school related variables which are associated with self-efficacy. The framework of the study is presented in Figure 1.

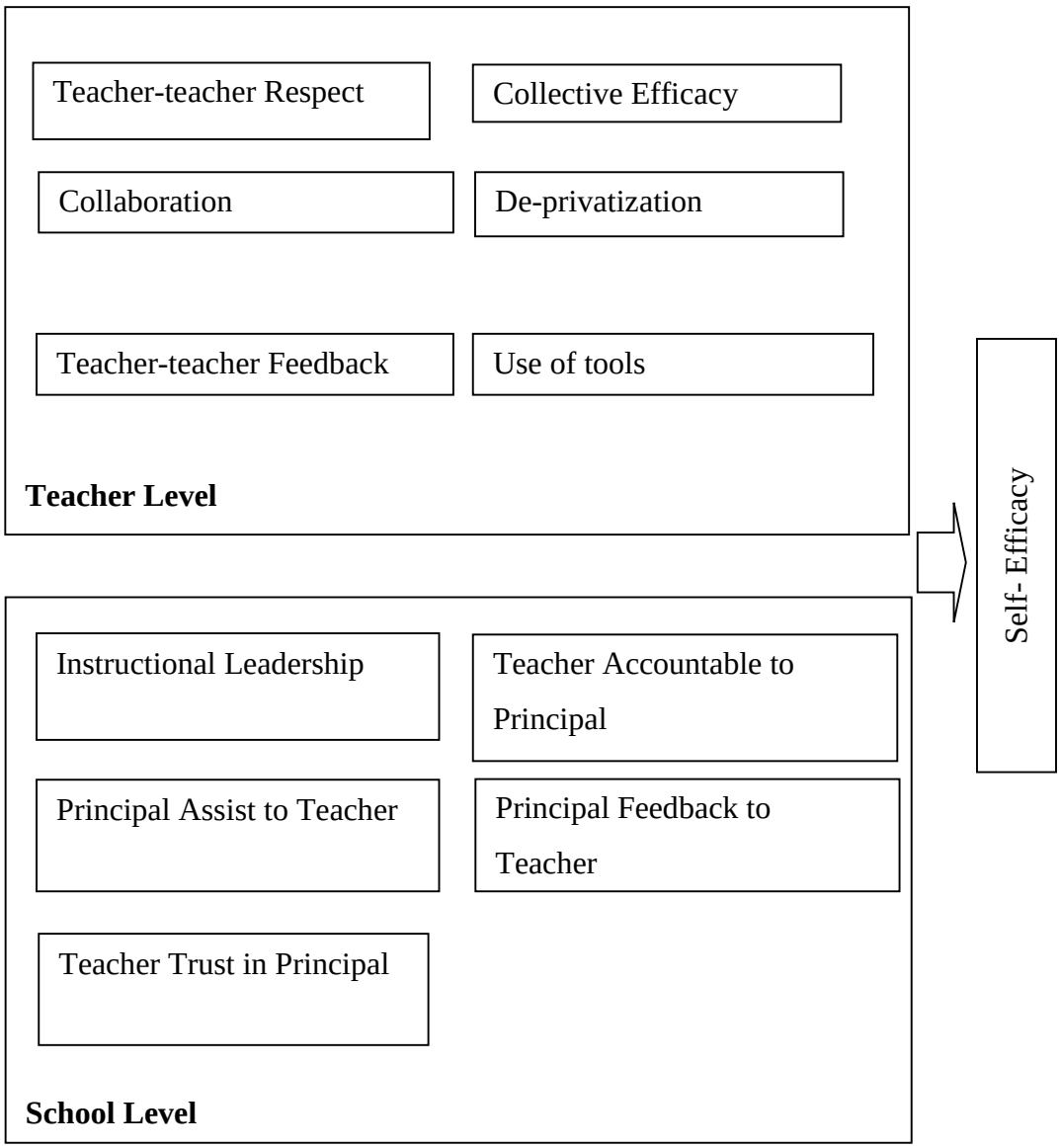


Figure 1 Framework of the Study

As it is seen in Figure 1, teacher related and school related factors were considered as two separate groups of variables with sub-dimensions. Since the original scale was conceptually developed as seen in Figure 1, as apriori analysis, factor structure equivalence was studied to verify that the scale functions similarly across the cultures. This is rather considered as the construct related evidence and within the framework of this study, it is considered as construct equivalence for a valid comparison across the cultures (Byrne & Van de Vijver, 2010). It is expected that the sub-dimensions, given in Figure 1, are verified similarly across the USA and Turkish samples. In the next step, item equivalence is expected across the cultures (Byrne & Van de Vijver, 2010). Thus, apriori analysis pertains both construct and item level equivalencies. If the similarity in the sub-dimension level is not verified in construct and item equivalence studies, the analyses about the factors related to teachers self-efficacy measures will be carried out within each culture separately. Similarly, equivalency of the self-efficacy measure is also one of the major issues since the study basically focuses on comparing teachers' self-efficacy measures across the cultures. This particular dimension will also be considered as one of the sub-dimensions presented in Figure 1.

Thus, in the present study, self-efficacy of Turkish and American middle school mathematics teachers and teacher and school related factors to self-efficacy measures were studied within a cross-cultural context.

More specifically this research aims to;

- Compare teachers' self-efficacy across Turkish and American middle school mathematics teachers.
- Compare the relationship of teacher and school related factors to mathematics teachers' self-efficacy across Turkey and the USA.

As was mentioned before, construct and item equivalencies were studied as apriori analysis in the present study. These analyses were presented under the result section of this dissertation.

1.1 Research Questions

1. Are there any mean differences in the teachers' self-efficacy measures across Turkish and American middle school mathematics teachers?
2. What are the teacher-related factors that explain Turkish middle school mathematics teachers' self-efficacy?
3. What are the teacher-related factors that explain American middle school mathematics teachers' self-efficacy?
4. What are the school related factors that explain American middle school mathematics teachers' self-efficacy?
5. What are the school related factors that explain Turkish middle school mathematics teachers' self-efficacy?

1.2 Definition of terms

Self-efficacy: Self-efficacy refers to assessment of middle school mathematics teachers' judgments of their capabilities to organize and execute actions required to attain a desired level of performance in mathematics courses.

1.) Teacher- related factors

Teacher related factors are linked with teachers' perceptions about themselves and others.

Teacher -teacher trust: Teacher-teacher trust is defined as teachers' feelings about their colleagues as showing respect to their colleagues' mathematics teaching, sharing feelings of teaching mathematics with colleagues.

Collective self-efficacy: Collective teacher efficacy refers to the shared belief of the group of middle school mathematics teachers as to their capabilities for organizing and executing the required activities for attaining a desired goal to increase mathematics achievement.

Use of tools: Mathematics curriculum related materials are defined as tools such as books, exercise books, and curriculum.

De-privatization (Professional Community):
Professional community of mathematics teachers is defined as de-privatization of teaching as teacher-teacher interactions at this community to observe, support and coordinate instructional activities at mathematics lessons so giving feedback based on observations.

2.) School- related factors:

School related factors are related with teacher and principal relations from the point of view of middle school mathematics teachers.

Principal Account Teacher: Principal willingness to be vulnerable to middle school mathematics teachers based on the confidence that principal is benevolent, reliable, competent, honest, and open to middle school mathematics teachers.

Instructional Leadership: Instructional leadership is defined based on three general functions of instructional leaders: defining the school's mission, managing middle school mathematics curriculum and middle school mathematics instruction, and promoting a positive school climate.

Principal Assist Teacher: Principal assist teacher defined as frequency of principals helping behaviors about mathematics instruction, students learning, curriculum, obtaining materials during the school year.

Providing Feedback: Providing feedback defined as principals of the middle school provide feedback to middle school teachers about effective teaching of mathematics, supporting students' needs, effective mathematics curriculum.

1.3 Significance of the Study

By understanding how individual and institutional characteristics affect teachers' efficacy beliefs, study is aimed to provide a knowledge base for administrators and policy makers who must develop policies to enhance teachers' capacity of effective

instruction and improve the likelihood of their continued positive commitment to teaching.

A few studies cover especially pre- service teachers' self-efficacy, their motivation, problem solving ability, their beliefs and thoughts related to new curriculum of middle schools in Turkey. Studies, which have conducted with the in-service elementary mathematics teachers, also related with their material usage, problem solving, curriculum application and thoughts related to new curriculum of middle schools in Turkey. Few studies have examined the relationships between teacher characteristics, school practices and self-efficacy beliefs and fewer still have examined the interplay of these factors in middle schools at Turkey.

1.4 Limitations of the Study

Limitations to the current study may include a low return rate of middle school mathematics teachers. Middle school mathematics teachers may answer more or less positively approach to fill the survey, if they believe the principal will have access to the answers. The length and amount of survey (16 pages and 30 minutes) may cause participants to quickly and thoughtlessly answer the questions, in order to complete the surveys. By not having qualitative data, it is difficult to know why participants answered in the manner they did. Since only one city center in Turkey and 2 districts in USA were being surveyed, the findings may not be generalizable.
Survey is a only proximate measure of dependent variable (self-efficacy). There is a disjuncture between teachers' aspirations and what they actually do when they are in front of students, although they are associated. Actual principals behaviors were not measured, only teachers perceptions of how their principals behave were measured. The study was limited to analysis of individual teachers' responses, although some of the constructs could be analyzed at both individual and school level.

A non- random sample is a limitation for the study. A non-random sample is less generalizable than a random sample in statistical analysis. The potential sampling error is larger in a non-random sample because the sample may not necessarily reflect the general population. Volunteer teachers were filled questionnaire because of that reason sample is a non-random sample.

Survey administered to only middle school mathematics teachers at Ankara, capital city of Turkey and 2 districts in US.

CHAPTER 2

LITERATURE REVIEW

This chapter involves the review of the related literature concerning the self-efficacy, teacher related factors, school related factors, and cross-cultural studies.

2.1 Self- Efficacy

Social cognitive theory defined self-efficacy as future oriented judgments about persons' capacities to organize and perform their actions in specific situations and contexts. Bandura (1986) proposed that strongest predictor of human motivation and behavior is self-efficacy. Bandura (1986) suggests that self-efficacy must be defined within the context of behaviors that are being studied to be useful. Thus, when investigating teacher self-efficacy, self-efficacy includes "self-efficacy about confidence to affect students' performance and about confidence to perform specific tasks."(Pajares, 1992, p. 136) as well as their self-efficacy about the causes of teachers performance in school settings.

Bandura (1986) hypothesizes four sources of self-efficacy shaping teachers' self-efficacy as mastery experiences, vicarious experiences, social persuasion and affective states. These sources are critical and important for individuals to the development of self-efficacy. Mastery experiences are the most powerful source of self-efficacy. Self-efficacy is increased if a teacher perceives her or his teaching performance to be success, which then contributes to be expectations that future performances will likely to be proficient. Self-efficacy is to be lowered if a teacher

perceives the performance a failure contributing to expectation that future performances will also fail. Attributions play a role whether success is attributed to internal or controllable causes such as ability or effort, self -efficacy is becomes better. On the other hand, success attributed to chance or intervention others then self-efficacy may not be strengthened. (Bandura, 1993; Pintrich & Schunk, 2002; Goddard, Hoy, Hoy, 2004; Tschannen-Moran, Hoy, 2007)

Vicarious experience is a skill that is modeled by someone else. The impact of the modeled performance on the observers' self-efficacy depends on the degree to which observer identifies with the model. The model performs well with self-efficacy of observer is most likely improved. When the model performs poorly or dissimilar to observer in terms of level of experience, training, gender than self-efficacy of the observer are likely to decrease. Teachers' sense of self- efficacy is enhanced by observing successful models with similar characteristics (Gorrel & Capron, 1988; Schunk, 1981, 1983, 1987; Schunk & Zimmerman, 1997, Goddard & Hoy and Hoy, 2004).

Social persuasion may arouse from encouragement or specific performance feedback from an administration or a colleague or a parent or it may involve in teachers' room, community, or media about the ability of teachers influence students. The potential of the persuasion depends on the credibility, trustworthiness, and expertise of the persuader (Bandura, 1986).

Psychological and emotional arousal, either of anxiety or of excitement, adds to individual teachers' feelings of self-capacity or incompetence. Feeling of pleasure or satisfaction a teacher experiences from teaching a successful lesson may increase her sense of self-efficacy, on the other hand high levels of stress or anxiety linked with a fear of losing control may result in lower self-efficacy.

Interpretation of the self-efficacy depends on cognition. The impact of mastery experiences on self-efficacy does not depend on the actual events of performance. Self-efficacy based on self -competence rather than actual level of competence. Self-efficacy of teachers are created when they weigh and interpret their performance relative to other information as contextual factors such as their perceived ability, school leadership, collegial support, student factors, resources and socioeconomic status. Judgments of personal competence are those a teacher makes about her

capabilities based on internal strengths and deficits. Bandura (1997) implied that the most rewarding thing is that teachers slightly overestimate their actual teaching skills, as their motivation to expend effort and to persist in the face of setbacks will help them to make the most of the skills and capacities they do possess. Therefore, the role of cognition is so critical, for all four sources of self-efficacy. Perception of self-efficacy for various individuals arises from cognitive and meta-cognitive processing of sources of self-efficacy.

Researchers who have been studying self- efficacy of teachers are beginning to recognize the need to extend self-efficacy research in order to both broaden and deepen our understanding of the self -efficacy construct. Such extension is supported by the development of a conceptual model of teacher self-efficacy (Tschannen-Moran et al., 1998) that clarifies the role of different conceptual strands within teacher self-efficacy research and that provides two new areas of research focus; first the investigation of the sourcing and processing of self-efficacy, and second, the broadening of the construct to tasks beyond traditional roles of teachers in school context.

Tasks are understood by context variables linked to higher self-efficacy. Social cognitive theory suggests that personal factors (including self- efficacy) and behaviors interact with the environment to influence each other through a process of reciprocal determinism. Reciprocal relationships were found between school contexts and teacher self-efficacy (Goddard &Goddard, 2001). Tschannen-Moran and her colleagues (1998) defined teachers' self-efficacy, which was related to teaching tasks, but they added contextual variables to their teachers' self-efficacy model. They suggested that personal competence of perceived demands for a teaching task were related to teachers' self-efficacy judgments.

Rivard, Follo, and Walsh (2004) tried to identify behavioral indicators, which increased teacher efficacy. Research was designed as qualitative study with twelve teachers of a school. Behavioral indicators of teacher efficacy was defined as seven components as : teaching efficacy, personal efficacy, sharing of expertise, participation in school committees, participation in school decisions, participating in budget decisions, and collective efficacy. Even though, literature stated the relation

of these seven variables to teachers efficacy of teachers efficacy affected from these seven behavioral indicators, the research was not related these behavioral indicators to four sources of efficacy which were defined by Bandura.

2.2 Teacher Related Factors

Teacher related factors are important since teachers improve each other's perceptions in the school to improve mathematics instruction. Teacher related factors were grouped as seven factors: teacher-teacher respect, collective efficacy, use of tools, de-privatization, de-privatization of teaching, teacher-teacher feedback, and collaboration.

2.2.1 Teacher-teacher Respect (Trust)

Trust among teachers is necessary for long-term improvements in the school environment (Byrk et all, 2010). Trust definition was made by Hoy and Tschannen-Moran (1999) organizational levels. These organizational levels are trust in principal, trust in colleagues, and trust in clients. Five features of trust are benevolence, competence, honesty, and openness. Ball (2010) defined trust as a "school-wide commitment to a shared vision, an effective process for making collaborative decisions and solving problems and school leadership that consistently supports teachers". Trust linked with a confidence and willingness toward the organization and a belief in the organization that "the latter party is benevolent, reliable, competent, honest and open" (Hoy & Miskel, 2008, p. 18)

Hoy and Tschannen (1999) indicated that faculty trust were predicted the other school variables. There was a positive relationship between teacher efficacy and faculty trust. The greater the perceived trust in a school, the greater the teachers self-efficacy. Teachers fell they can organize and execute actions more positively. Furthermore, increased faculty trust decreases the faculty conflict in the school. Trust was predicted other school related variables.

Da Costa and Riordan (1996) studied the relationship of teacher trust and teacher efficacy. Interviews and conference transcripts were gathered from 10 days of teachers from three elementary schools in a large Canadian city.10 teachers worked

five days in multiple cycles of collaborative consultation during one school year. The goal of the study was to show a significant correlation between trust, efficacy, and collaboration. When trust was evident in the relationship between the members, the collaboration proved to be more effective. According to Da Costa and Riordan (1996), highly efficacious teachers even in the absence of trust are less likely to avoid collaboration because they believe in their personal capabilities. Thus, there are several dimensions to teacher trust and success of the school as a whole.

Ball (2010) investigated relationships among teacher self-efficacy, teacher trust to each other, and collective efficacy among teachers in southwest Texas. The research included three established surveys combined to create a single survey and administered to 746 teachers. A multivariate analysis of variance was conducted to analyze the data from the survey. When comparing the responses to national averages, results were as follows: self-efficacy showed patterns that were below average, trust showed patterns that were above average, and collective efficacy was average. The teachers with higher self-efficacy are more likely to appreciate other teachers' contributions to the functioning of the school as fulfilling their obligations, and perceive the whole school as a fine-tuned machine mastering its mission.

Okpogba (2011) studied the relationship between teacher self-efficacy, organizational structure, and collegial trust. These variables were used to explore possible empirical relationships among them. The study was conducted in a private, Catholic university of a Midwestern state. The research design was mixed study. There was statistically significant relationship between teaching self-efficacy and organizational structure and collegial trust. In the study, neither enabling structure nor collegial trust was related to teaching self-efficacy. This finding is confirmed by interview responses. Interview responses suggest that the teaching task itself that appears negatively to affect teacher self-efficacy more than anything else does.

Hoy and Tarter (2011) defined trust as not only as a positive outcome but also as a positive dynamic process. Trust is a valuable end in itself as well as a means to enabling school structures (Hoy, Sweetland, & Smith, 2002) and healthier

organizational dynamics (Smith, Hoy, & Sweetland, 2001). Dynamic process in a school environment has teacher related factors and school related factors so the link between those variables of healthier school environment and the self-efficacy is necessary and important. The link between teacher self-efficacy and teacher-teacher trust has not been searched in depth in the literature (Wahlstrom, Louis, 2008).

2.2.2 Collective Efficacy

Collective teacher efficacy defined as the shared belief of the group of teachers as to their capabilities for organizing and executing the required teaching activities for attaining a desired goal (Bandura, 1997).

Goddard and Goddard (2001) empirically measured the strength of the relationship between teacher self-efficacy and collective self-efficacy. Data was collected from 438 teachers of 47 schools in an urban district. The results of the study confirmed that collective self-efficacy predicted the variation in teacher self-efficacy. That variation was more than the variation explained by the school contextual variables which covered the socioeconomic status and student achievement.

Knoblauch and Hoy (2008) investigated pre-service teachers' self-efficacy, collective teacher efficacy, and perceived cooperating teachers' efficacy. Those beliefs were examined with the focus on context, mainly the school setting (i.e., rural, suburban, and urban). Researcher tried to determine whether school setting played a role in the development pre-service teachers' self-efficacy. 102 pre-service teachers participated to study. All school settings indicated a significant increases in pre-service teachers' self-efficacy. Urban pre-service teachers indicated significantly lower perceived collective efficacy. Perceived cooperating teachers' self-efficacy positively predicted the pre-service teachers' post-TSES scores.

Kurz and Knight (2004) studied the teacher self-efficacy, collective efficacy and goal consensus/vision. 113 teachers of a high school which located in the southwestern of USA participated to study. Three survey were used to collect data from teachers during an in-service meeting. The relationships among the teacher self-efficacy, collective efficacy and goal consensus/vision were analyzed through correlational

and regression analyses. Collective efficacy was correlated with the teacher self-efficacy and goal consensus/vision. Collective efficacy was highly correlated with the goal consensus/vision. There was no correlation between teacher self-efficacy and goal consensus/vision. Teacher self-efficacy, collective efficacy and goal consensus/vision was related with each other, all have an impact on the remaining two of variables.

Lev and Koslowsky (2009) explored the relationship between teacher collective efficacy and teacher self-efficacy. The study collected data over time from 97 junior and high school teachers. Research indicated that there was a positive relationship between teacher self-efficacy and teacher collective efficacy. There was no group difference between junior and high school teachers.

When teachers involve more in a professional community, then teachers' personal and collective efficacy increased (Wahlstrom & Louis, 2008). Being in a professional community is important for teacher self-efficacy. Teachers generally affect each other positively in a positive school environment.

Takahaski (2011) studied the connection between teachers' efficacy and teachers' evidence-based decision-making practices. Researcher used the "communities of practice" approach and case study. Communities of practice theory is based connections between shared practices, collective meaning and making, and identity. Identity is defined as how participation in shared activities connected to teachers' efficacy. Data were collected via interviews with four teachers. Interviews was based on teachers co-construct their self-efficacy in shared practices. Researcher recommended the usefulness of communities of practice to comprehend the teachers' self-efficacy development. Study implied the need of longitudinal qualitative study to analyze change in teachers' self-efficacy over time. Moreover, this methodology supply a more contextualized and nuanced examination of the reasons of self-efficacy beliefs.

Teachers of a school, which have a higher collective efficacy environment, are more willing to show extra effort and social behavior for the school environment.

2.2.3 Use of tools

Tools can be stated as curriculum materials. Curriculum materials were textbooks, student books and teacher. How frequently teachers used curriculum materials could be linked with the self-efficacy of mathematics teachers. This relation was not clearly searched at the literature. However, teachers' self-efficacy linked with the teachers learning and the link between self-efficacy and teacher learning studied at the literature.

Collopy (2004) analyzed 2 upper-elementary teachers' learning. How teachers use potentially educative mathematics curriculum materials were examined. Data were collected through 41 observations of the teachers' mathematics lessons and 28 interviews of the teachers. The cases of the study-demonstrated teachers' dynamic and divergent nature of opportunities to learn through enacting lessons and reading materials. Analyzed of the data indicated that curriculum materials could not be an effective tool for teachers. One of the two teachers' instructional focus and rationale for instructional practices was stable during the academic year but other teacher' instructional focus and rationale for instructional practices was changed dramatically. Moreover, interactions between self-efficacy integral to teachers'' identity and those that was target for change might illuminate responses to potential educative curriculum materials.

Davis and Krajcik (2005) searched that how teacher learning with educative curriculum materials looks like. A set of design heuristics for educative curriculum materials were presented at the study. The principles of these materials were added to design. The study was originated the idea of teacher learning and organize the heuristics around the main parts of teachers knowledge. Teachers' knowledge was based on subject natter knowledge, pedagogical content knowledge for topics and pedagogical content knowledge for the disciplinary practices. How educative curriculum materials might promote the teacher learning was supported by heuristics. Educative materials serve as a cognitive tool that was placed in teachers' practices.

Drake and Sherin (2006) examined how teachers used reform-based curriculum and particularly how they adopt the reform-based curriculum before, during and after instruction. This study was a part of a larger study which was investigated teachers usage and teachers' learning from the reform based curriculum. Each classroom was supported by the curriculum which covered student activity books, guide for teachers daily lesson descriptions which were prepared in detail, extra practice materials, a little manipulatives, and end-of-unit assessments. Researchers found that teachers had models of curriculum use, which helped to explain teachers' approach toward adopting curriculum. Moreover, teachers' narrative identities as learners and mathematics teachers helped to frame understanding of these approaches. Researchers developed understanding of relationship between teacher narratives and mathematic teachers' practices.

Stevens et al. (2009) reported on an effort to design and evaluate activities. Activities focus on mathematics knowledge for teaching and self-efficacy. Teachers' perceptions about different teaching strategies and materials were evaluated by using exploratory factor analysis and Q methodology. According to study, self-efficacy statement teachers' preferences for certain learning statements did not consistent across the type of content, which were taught at the classroom. Teachers were grouped to three different factors according to their self-efficacy and self-efficacy groups related to degree of content application preferred and teaching experience at K-12.

Telese (2012) compared the effect of degree of that teachers took reform oriented professional development activities on students mathematics achievement. The data of Grade 8 from National Association of Educational Progress, 2005 were used. Researcher found that teachers who participated fewer professional development activities had students with higher mathematics scores than those students' whose mathematics teachers reported either in more professional development activities. The possible reasons of this result should be studied deeply. Possible answer would be Desimone's (2009) conceptual framework. Conceptual framework includes the teachers' beliefs, and teachers' attitudes. These two constructs were not analyzed in

this study. The link between professional development activities and these two constructs should be analyzed to find the answer of this relation.

2.2.4 De-privatization (Professional Community-Reflective Dialogue)

Professional community is related with shared ideas, development of instruction; support each other, sharing of practices. During the academic year, these factors are so deeply inserted that teachers are often not conscious about them. When teacher talk about the quality of students learning and collaborative work, they implemented teaching practices to improve students' learning. Teachers have to learn how successfully interact.

Da costa and Riordan (1996) analyzed the relationship between teachers' willingness to engage in collaborative relationships with their colleagues in their school and teachers' self-efficacy. Their study confirmed the positive relationship between teachers' willingness to engage in collaborative relationships with their colleagues in their school and teachers' self-efficacy

Little (2002) searched that how teacher community serves as a resource for teacher development. It was a qualitative study which was done in 2 years in two urban school. First school participated in a whole school reform, which sustained high teacher commitment and school level community. On the other hand, school's departments varied disposition and capacity to analyze the problems of teaching and learning and the classroom level. At the second school, at the department level in mathematics innovative teacher communities were established but weak organizational support for teacher development were constituted problems of stress and turnover. Study highlighted the importance of professional communities and challenge of capitalizing on such communities to increase whole-school reform. The study advises complex relationships among institutional reform, organizational context, teacher development, and teacher commitment.

Collective learning is linked positively with the new practices of teachers in the presence of professional community.

2.2.5 De-privatization of Teaching

School Climate is defined as increasing the visibility of mathematics classrooms by observations of teachers and providing feedback to each other at the end of the observation event .Observation of the other teachers mathematics classroom or being observed and taking feedback have an impact on teachers' self-efficacy (Hoy & Woolfolk, 1993; Moore & Esselman, 1994).

Louis & Marks (1998) examined the influence of school professional community on two dimensions of classroom organization. Qualitative and quantitative analytic methods were used. Data were collected from 24 nationally selected, restructuring high, middle, elementary schools. Professional communities in these schools were strongly related with the dimensions of classroom organization. Researchers stated that the organization of teachers' work in ways that promote professional community has a significant positive relationship with the organization of classrooms for learning and the academic performance of students.

Little (2003, cited in Wahlstrom, Louis, 2008) emphasized that inviting colleagues in to observe a lesson would be expected and normal behavior of the teachers.

Courneya et al. (2008) study, studied practices of peer observation of teaching and certain approaches. Teachers as participants observed and free form evaluated the effectiveness of two different teaching scenarios. Teaching scenarios were evaluated both before and after identifying teachers' own dominant perspective on teaching. Teachers were attending a workshop about five perspectives on teaching which were explained in detail. Teachers were requested to observe their colleagues. Teachers reflected on their own teaching practices in an effort to encourage meta-cognition for the observing colleagues. Though, instead of think through opportunities to change their practices, most teachers who observed colleagues identified what was "good" about the teacher in the observed classroom. Instead of adjusting their self-perception of teaching practice, teachers had a habit of to score colleagues higher if they saw similarities between their own teaching styles and observed teaching style.

Kennedy & Smith (2013) analyzed the relationship between practices in school on teachers' self-efficacy and school organizations. Surveys were administered to 661 teachers from 42 schools in the United States. Surveys measured both individual sources of teachers' self-efficacy and their schools organizational behavior. Findings of the study supported literature that stated a relationship between self-efficacy and collaborative organizational culture. Self-efficacy has a positive relationship to the organizational behavior.

2.2.6. Teacher- teacher Feedback

Behavior is changed or structured when feedback is receive from colleagues. Teachers also change their teaching practices when compared with personal goals (Kluger & DeNisi, 1996; Carver & Scheier, 1982 as cited in Goldring, 2014).

Goldring et. al. (2014) explored adjustment and enactment of principals to multisource feedback on their effectiveness as instructional leaders.14 principals were interviewed 2 times in a year at the Southeast of America. Qualitative analysis was conducted to examine reactions to their feedback. Their study was found that principals often experience cognitive dissonance when feedback from different data sources compared. This finding could be result in a motivation to reduce dissonance by either providing explanations and excuses, or making actual changes that result in professional improvement. Goldring et. al. (2014) stated that feedback facilitates communication and provides unique perspectives and serves a reliable source of information.

2.2.7. Collaboration

Teacher collaboration is defined as a means for instructional activities, introducing a lesson, classroom management, grouping students, supporting students, and conducting whole class discussions can contribute to teachers' self-efficacy (Guskey, 1987 as cited in Shachar & Shmuelevitz, 1997).

Shachar & Shmuelevitz (1997) examined the effects of a year-pong in-service teacher training program on cooperative learning methods with four scales teachers' self-efficacy of a year-long in-service teacher-training program on cooperative

learning methods with four scales. Teacher self-efficacy questionnaire and a questionnaire assessing teachers' collaboration were administered to 121 teachers from 9 junior high school in Israel. The data were analyzed at three different frequencies with which teachers implemented cooperative learning in their classrooms. Regression analyses were run. Results of the study pointed to that teachers who implemented cooperative learning most frequently expressed a higher level of self-efficacy in promoting the learning of slow students than did other teachers in their school. Moreover, teachers who reported a higher level of collaboration with their colleagues at their school also expressed a higher level of general teaching efficacy and self-efficacy in enhancing students' social relations, than did teachers who reported a low level of collaboration with their colleagues. In addition, frequency of implementing cooperative learning and collaboration with their colleagues explained the largest portion of the variance in teachers' self-efficacy, while teachers' background variables accounted for only negligible amounts of variance in teachers' self-efficacy.

Da Costa and Riordan (1996) examined the implication of teacher trust, collaboration and efficacy. A qualitative study of 10 teachers who worked as five days in multiple cycles of collaborative consultation during one school year was performed. The study showed a significant correlation between trust, efficacy, and collaboration. When trust was evident in the relationship between the members, the collaboration proved to be more effective. Da Costa and Riordan's review of the literature indicated that teacher trust was considered fundamental due to the risk-taking involved in effective collaboration. Trust was critical and facilitated, collaboration was received with an open mind and was effective; it was not always deemed necessary if the teachers involved in the collaboration efforts all were highly efficacious teachers. According to researchers, highly efficacious teachers even in the absence of trust are less likely to avoid collaboration because they believe in their personal capabilities.

Coburn & Russell (2008) investigated the role of policy in the nature and configuration of teachers' social networks. Data from a longitudinal study, which were funded by the National Science Foundation, were analyzed from two urban

school districts. Data was collected concerning the interaction among district human and social capital, reform strategies, and the implementation of ambitious mathematics curricula in two urban school districts. Researchers concluded that social networks were potentially important for curriculum implementation. The first reason was that teachers provided opportunities for social capital transactions; Second reason was that teachers provided access to information. Last reason is that teacher was proficiency to support learning, and fostered the depth of interaction that might be necessary for teachers to grapple with new approaches in ways. These ways might help them to question their assumptions and reconfigure their instructional practice over time.

Penuel et. al. (2008) analyzed social network analysis. Data was collected through with interview and questionnaire from two elementary schools as a case study approach over two years. Research was analyzed how the formal and informal aspects of a school's social context were aligned. Researchers estimated the relative effect of formal and informal processes on patterns of advice giving in each school by fitting multilevel social selection models to longitudinal social network data, which were collected from questionnaires. Researchers suggested to endorse formal collaboration can and do diverge in teachers success in ways that were evident from social network analyses.

Moolenear (2012) examined the relationship between student achievement and teacher networks and the mediating role of teachers' collective efficacy. Data were gathered from 53 elementary schools in Netherlands. Multiple regression analysis and social network analysis were used to analyze data. Researcher analyzed data of student achievement and teacher survey. Researcher found well-connected teacher networks were related with strong teacher collective efficacy. Strong teacher collective efficacy was implied supported student achievement.

2.3 School Related Factors

Literature, which is associated with school reform, has regularly recommended that creating effective schools needs that principals become instructional leaders

(Camburn, Rowan, & Taylor, 2003). To accomplish being an instructional leader, principals should entangle in instructional process, should assist teachers in their problems, should be accountable to teachers in instructional process, and should provide feedback. They must understand how their behaviors and their personal characteristics affect teacher efficacy. These functions are grouped as principal feedback to teacher, principal assist to teacher, teacher trust in principal, instructional leadership, and teacher accountability to teacher.

2.3.1 Principal Feedback to Teacher

Behavior is altered or regulated when teachers get feedback and when teachers compared these feedbacks with their goals (Kluger & DeNisi, 1996; Carver & Scheier, 1982 as cited in Goldring, 2014).

Principals can observe a mathematics lesson; they can provide helpful feedback to mathematics teachers. Frequent observations of principals have been clearly linked to improved instructional capacity of the school so improved teacher self-efficacy.

Supovitz and Poglinco (2001) noted that effective monitoring requires not only that principals spend more time in classrooms, but also that they focus closely on what is happening during instruction, listening to what students are saying for indications about how well students understand their work.

Goldring et al. (2014) searched how principals orient and react to multisource feedback on their effectiveness as instructional leaders and how principals interpret gaps between their self-assessments of their leadership effectiveness and their teachers' ratings of their leadership effectiveness. Data were collected from 14 principals through interviewing in the southeast of Unites States and two points in time. Qualitative analysis was run to analyze principals' reactions and orientations to their feedback. Findings indicated that principals often experience cognitive dissonance when feedback from different data sources. If, principals' feedback continued to become more ordinary in school environment, it would become increasingly essential to form capacity around the processes of receiving and giving

feedback. Research stated that feedback facilitates communication and provides unique perspectives and serves a reliable source of information.

2.3.2 Principal Assist Teacher

Tschannen-Moran and Woolfolk-Hoy (2007) found that there is a positive correlation between level of teachers' self-efficacy and seeking others in the organization for the support.

Wahlstrom and Louis (2008) explored the principal assist teacher factors that affect teachers' self-efficacy. Data for their study was from a national research project 4165 elementary and secondary school teachers participated in. Teacher self-efficacy has modest effect on principal assist teacher, and has a significant effect on instructional leadership.

2.3.3 Teacher Trust in Principal

In their study, the effect of teachers' trust on the principal become less important once principal shares the leadership activities with teachers in the school and teachers feel that school has a professional environment.

Hoy et al. (2006) conceptualized and applied the construct of trust which was defined as mindfulness to schools. They searched trust as a school condition which fosters mindful actions in the school. 126 teachers from 75 middle schools were selected to participate to study. Data were collected through administering survey instruments by researchers in regular faculty meetings. Data was analyzed using exploratory factor analysis, correlational, and regression. School mindfulness and faculty trust looked as if essential conditions for each other. Every school administrator should understand and practice the school mindfulness. a culture of trust appeared compulsory to achieve both the ends of understanding and practice. School principal can have profound effects on school mindfulness by encouraging faculty to play with ideas, to feel safe to take reasonable risks, to create novelty in their classrooms, to experiment, and to be resilient.

Tschannen-Moran (2009) hypothesized that the degree of teacher professionalism in a school would be linked to the faculty trust evident among teachers and principals in

the school community. Survey was administered to 80 middle school teachers in mid-Atlantic state. Five construct were constituted based on survey data. One of these was teacher professionalism which was assessed using subscale of the School Climate index. Rest of the five constructs were the professional orientation of principals and faculty trust on principals, their colleagues, and their clients (parents and students). Teacher professionalism was linked with professional orientation of school administrators and faculty trust.

2.3.4 Instructional Leadership

Hipp and Bredeson (1995) claimed that "the principal is the key to facilitating decisions that affect not only the working conditions of the school, but also those professionals who work in it".(p.141). Instructional leadership is identified by three general functions: managing curriculum and instruction, defining the school's mission, and promoting a positive school culture (Hallinger, Murphy, Weil, Mesa, and Mitman 1983 cited in Marzano, 2005).

Hipp (1996) analyzed the relationships between principals' leadership and teacher self-efficacy in middle schools of Wisconsin. Researcher administrated the survey to 10 principals and 280 teachers from 10 middle schools for the phase one (quantitative part) and interviewed with 10 principals and 34 middle school teachers for phase 2 (qualitative part). She found that principal behavior was significantly related to the personal teaching self-efficacy. Quantitative part confirmed that instructional leadership sustain and reinforce teacher efficacy. The study revealed that direct principal behaviors and indirect figurative forms of instructional leadership impacts teachers' work and its outcomes.

Nelson & Sassi (2005, cited at Katterfeld, 2013) conducted in-depth study of a small number of elementary school principals' leadership practices. They found that principals support teachers' effective use of high quality of mathematics tasks.

Walker and Slear (2011) studied the effects of principal behaviors on teacher efficacy levels. They defined first role of the school principal as influencing teachers' self-efficacy at their school. After reviewing the literature, they found a common theme

that encompassed 11 specific characteristics that may affect teacher efficacy. The scale allows teachers to rate their principals on how important they feel each characteristic is. Their results showed statistically significant relationships between teacher self-efficacy and three out of the 11 principal behaviors. Three of these eleven principals behaviors that significantly affected teacher self-efficacy were modeling instructional communication, expectations, and providing contingent rewards. Modeling instructional communication and expectations were positively linked to teacher self-efficacy on the other hand providing a contingent reward be negatively related.

Dale et al. (2011) examined the influences of instructional leadership, transformational leadership and the mediating effects of teacher self-efficacy. Researchers monitored third grade through fifth grade students' mathematics achievement on the Maryland School Assessment. 177 elementary mathematics teachers participated to study and mediated regression was used. They found that teacher self-efficacy was not significantly predicted by instructional leadership. However, instructional leadership positively and significantly predicted mathematics achievement and teacher self-efficacy had a significant and direct impact on students' mathematics achievement. Instructional leadership was not mediated by teacher self-efficacy when applied to elementary students' mathematics achievement.

Katterfeld (2013) investigated how principals' instructional leadership predicted the expectations that middle school mathematics teachers perceive for classroom practice. She used data from four urban school districts. Middle school mathematics teachers' data was analyzed by a hierarchical generalized linear (HGLM) model. She showed that principals' work to frame instructional vision, and principal's own vision, both of them predicted perceived mathematics instruction.

Nelson & Sassi (2005) conducted in-depth study of a small number of elementary school principal leadership practices. They found that principals support teachers' effective use of high quality mathematical tasks and questioning strategies that help students to make connections between mathematical ideas.

Rew (2013) studied that how school principals' instructional leadership practices influenced by the teachers' self-efficacy beliefs. Data came from 2007-2008 Teaching and Learning International Study of OECD. It was a secondary analysis of teachers' data. Twenty-one countries participated to study at 297-2008 academic year. Research indicated that school characteristics, teacher characteristics, instructional characteristics and cross-level interactions had statistically significant relations with the teachers' self-efficacy beliefs of teachers across countries.

Brewster and Klump (2005) write, "The instructional leadership model attempts to draw principals' attention back to teaching and learning, and away from the administrative and managerial tasks that continue to consume most principals' time" (p.5). Stewart stated that (2006) "Instructional leaders focus on how administrators and teachers improve teaching and learning" (p.4). Kruger, Witziers, and Sleegers (2007), stated that instructional leaders are characterized by the number of activities that are positively connected to student achievement, such as "emphasis on basic subjects, coordination of instructional programs, and orientation towards educational development and innovation" (p. 2).

Sahin (2011) examined instructional leadership and school culture. His research tried to determine whether instructional leadership explains the culture of the school environment. This was a quantitative investigation. The surveys which were "Instructional Leadership Inventory" and "Inventory of School Culture" were used to collect data. The surveys were administrated to 157 urban elementary schools. The schools were six Curriculum Laboratory Schools (CLS) in İzmir. The results of the study confirmed that teachers inclined to perceive the instructional leadership style of their principals and the culture of their schools positively. There is a positive and high-level relationship between the principals' instructional leadership style and culture of school. The results indicated that instructional leadership statistically has a statistically significant influence upon all factors of school culture.

Goldring et. al. (2014) explored principals' orientations. Data were collected through interviews with 14 principals in America. The study was qualitative study. TO

measure principals' orientations, a researcher examined how principals interpret breaks their self-assessments of their leadership effectiveness and teachers' ratings of principals' leadership effectiveness. Four principals' self-ratings were lower than their teachers' self-ratings. Three of four principals were positive, open to giving feedback. Seven principals' self-ratings were equal to their teachers' self-ratings. Six of those principals' were positive and receptive or neutral and curious. Three principals'' self-ratings were greater than their teacher was' self-ratings. Two of them were defensive and negative. Teachers' views of their principal's leadership related to effective teaching practices in their classrooms.

2.3.5 Teacher Accountability to Principal

Nelson & Sassi (2005) conducted in-depth study of a small number of elementary school principals' leadership practices. They found that principals support teachers' effective use of high quality mathematical tasks and questioning strategies that help students to make connections between mathematical ideas.

Tschannen-Moran and Gareis (2004) who studied the variables of efficacy as related to principals and teachers by analyzing the relationships between efficacy as well as principal leadership characteristics and trust.

Walker and Slear (2011) used the principal trust scale developed by Gareis and Tschannen-Moran in 2005 and the Faculty Trust Scales developed by Tschannen-Moran and Hoy in 1999. Walker and Slear (2011), correlated with characteristics found in faculty trust and principal trust. The characteristics include communication, consideration, empowering staff, and inspiring group purpose.

Wahlstrom and Louis (2008) explored the principal account teacher factor that affects teachers' self-efficacy. Data for their study was from a national research project 4165 teachers participated in. Teacher self-efficacy has significant effects on principal account teacher. Wahlstrom and Louis (2008) found that when a school possesses a high level of trust, the efficacy of teachers is minimally affected by a principal's behavior; and when a school possesses low trust levels, efficacy of teachers is more

affected by a principal's behavior. This suggests that there is a complex balance of impacting relationships in a school.

Ryan (2007) used the TSES-long form to measure teacher efficacy. Jantzi and Leithwood's principal leadership questionnaire (PLQ) was used measure leadership qualities. Research tried to assess the characteristics that influence teacher self-efficacy (Ryan, 2007). The researcher found no significant relationship between teacher self-efficacy and leadership characteristics with regard to middle school level teachers.

Van Maele & Van Houtte (2009) used Tschannen-Moran & Hoy's (1999) faculty trust scale to determine the organizational characteristics that influenced teacher efficacy; however, the data could not explain the relationships between faculty trust and the principal characteristics. It was suggested that individual characteristics possessed by the principal determine trust, rather than organizational factors (Van Maele & Van Houtte 2009). The gaps in the study are recognized as the absence of collecting data related to specific principal leadership characteristics.

Tanya (2013) analyzed the relationship between four variables: principal leadership characteristics, principal trust, faculty trust, and teacher self-efficacy to create a more complete picture of how different relationships affect one another in middle schools. There are positive links between principal leadership characteristics, levels of teacher efficacy, and trust. Sample was middle school teachers from a rural district in southern California. Survey was used to collect data. Responses from 24 teachers and 1 principal were analyzed to determine whether specific principal behaviors affected teacher efficacy as a group and by gender. Analyses examined the correlations between principal leadership characteristics, teacher efficacy, principal trust in teachers, teacher trust in the principal and teacher trust in each other. Findings of the study implied that the variables examined are significantly related and vary based on gender.

Supovitz, Sirinides, and May (2010) found that principal leadership centering on instruction, trust, and a clearly communicated school mission was associated positively with teachers' self-reported instructional changes in both English language

arts and mathematics. Researchers further made connections between principals' leadership practices, teachers' instructional changes.

2.4 Cross- Cultural Studies

Much of the research on the teacher self-efficacy and relation between components has been structured in Western countries. However, parallel results of relation between teacher self-efficacy and relation have been observed in Eastern Asian countries. Eastern culture is different from western culture. Eastern culture is more collective culture dominates all teaching profession factors. Cross-cultural research about teacher self –efficacy and relation between self-efficacy and teacher related factors and school related factors in different cultural are going to summarize in this section.

Ho and Hau (2004) compared Australian and Chinese teachers' self-efficacy in guidance, instruction, discipline, and beliefs about exterior influences. Two staged studies were directed. 316 Australian teachers and 411 Hong Kong Chinese teachers were participated to study. Multiple-group confirmatory factor analyses were run Research was indicated highly comparable factorial structures of teacher self-efficacy for Australian and Chinese teacher but personal guidance self-efficacy was more differentiated from personal instruction and discipline efficacy among Australian teachers. For further research, more evidence was need to incorporate cultural factors into future teacher self-efficacy studies.

Klassen et al. (2010) examined whether teachers' collective efficacy, job stress, and the cultural dimension of collectivism were predicted teachers' job satisfaction. Canada, United States and Korea (South Korea or Republic of Korea) were participated to study. Sample was 500 teachers from these countries. Data was analyzed using multi-group path analysis. Analysis results were indicated that cultural dimension of collectivism was significantly related to job satisfaction for Korean teachers. On the other hand, cultural dimension of collectivism was not predicted the job satisfaction of American teachers. Cultural context influences were understood and stated the motivational beliefs in diverse school settings.

Lee, Zhang and Hongbiao (2011) explored the connections between the professional learning community, collective efficacy, trust in colleagues, and teachers' commitment to students. Data was collected through Professional Learning Communities Assessment (PLCA) from Chinese teachers. Data was analyzed with Exploratory Factor Analysis (EFA). According to results of EFA, three components were extracted from the data collected through PLCA. These components were trust in colleagues, collective efficacy and teachers' commitment to students. Multilevel analyses were directed to indicate the relations between school–related variables and components of PLCA. Trust in colleagues, collective efficacy and collective learning in application and supportive structures were positively and significantly predicted the school-related factors of teachers' commitment in Chinese schools. Shared and supportive leadership was not a significant predicted teachers' commitment in Chinese schools. Moreover, trust in colleagues has a positive significant relationship with the collective efficacy of teachers about instructional strategies. Collective efficacy on students' discipline was predicted by trust in colleagues and collective learning and application.

Law (2011) investigated how teachers developed distributed curriculum leadership with their efficacy beliefs among themselves in East Asian schools. Teachers meetings which were in a mathematics curriculum development team were videotaped and their meetings were analyzed with discourse analysis. Through discourse analyses, teachers learning from each other and leadership behaviors were analyzed. Research found that increased support for teacher leadership increased the teacher learning. Study results implied that schools should cooperate to build leadership. Teachers' development should be important for building leadership in their schools.

Cakiroglu (2008) compared pre-service elementary teachers' sense of mathematics teaching efficacy beliefs across Turkish and American pre-service teachers. Mathematics Teaching Beliefs Instrument was administered to 141Turkish pre-service elementary teachers, and 104 American pre-service elementary teachers. Researcher found that pre-service teachers in Turkey have a tendency o have a stronger belief compared to their American colleagues that teaching can influence

student learning. However, a similar difference was not perceived for personal mathematics teaching efficacy across the cultures.

Çetinkaya and Erbas (2011) analyzed the psychometric properties Mathematics Teacher Efficacy Belief Instrument. Survey was adopted to construct validity of the Turkish adaptation was satisfied for the instrument.. The instrument developed originally by Enochs, Smith, & Huinker (2000) for in-service mathematics teachers. Two dimensions of efficacy beliefs as personal mathematics teaching efficacy and mathematics teaching outcome expectancy for mathematics teachers were investigated. 1355 in-service Turkish elementary and middle school teachers and 368 schools were participated to study. Data was analyzed with exploratory and confirmatory factor analysis Results of the analyses revealed a two-factor structure in Turkish sample. This result was found at the similar studies.

Rew (2013) studied the relation between school principals who were using specific instructional leadership practices self-efficacy beliefs of lower secondary education teachers. The analyses were run by using data of 2007-2008 Teaching and Learning International Study (TALIS) of OECD. It was a secondary analysis teacher data. Twenty-one countries were participated to study. He found that several teacher characteristics, instructional leadership practices, school characteristics and cross-level interactions had statistically significant relations with the self-efficacy of lower secondary education teachers across the countries. Using specific instructional leadership practices was positively and significantly predicted the self-efficacy of lower secondary school teachers across countries.

2.5 Summary of Literature Review

Self-efficacy has been studied from different perspectives in the literature. In general, school climate affects teachers' self-efficacy. School climate pertains teachers' relation, their respect to each other, their collaboration, and their relation with their principals. School climate affects teachers' self-efficacy directly. Mathematics teachers were influenced by the principal's influence beyond the administration and curriculum. They affect teachers' self-efficacy in the classroom and in the school.

Identifying behaviors that linked with teachers' self-efficacy has potential to unlock tremendously positive advances in teachers' self-efficacy. The factors considered in relation to self-efficacy of teachers are all related to school climate, where, the school principals play an important role in educational practices. In general, good leadership displayed by the school principals eventually affects teachers' self-efficacy positively. Naturally, positive efficacy of teachers is expected to foster students learning. In the present study, the results will provide information about the optimal school climate to improve teachers' efficacy beliefs in a cross-cultural setting.

CHAPTER 3

METHODOLOGY

This chapter presents the methodology of the study. Sections in this chapter are research design, population and sampling, instruments, data collection and statistical techniques utilized in the analysis of data and effect sizes.

3.1 Research Design

Aims of the study are: (1) to compare teacher self-efficacy across Turkish and American in-service middle school mathematics teachers, (2) to compare the relationship of teacher and school related factors to mathematics teachers' self-efficacy across Turkey and the USA.

This is a cross-cultural study through which information about middle school mathematics teachers across two countries were collected. In the survey, there are sections about self-efficacy, teacher- teacher respect, collective efficacy, use of tools, de-privatization, teacher-teacher feedback, principal feedback to teacher, principal assist to teacher, teacher trust in principal, instructional leadership, teacher accountable to principal. The survey was administered as a single survey booklet to Turkish in-service middle school mathematics teachers by the researcher. The Turkish in-service middle school mathematics teachers were informed about the administration of the survey by the researcher in advance and the consent forms were obtained. The survey administered in approximately 30 minutes. American in-service teachers who were

volunteers filled the survey online. The American data were taken from the Middle-school Mathematics and the Institutional Setting of Teaching (MIST) project of Vanderbilt University. Researcher of MIST Project collected survey data. The quantitative data were analyzed through Structural Equation Modelling (SEM) and Multivariate Analysis of Variance (MANOVA) statistical techniques. This is a survey research which could be considered as casual comparative and correlational.

3.2 Population and Sample

This is a cross-cultural study using two samples coming from Turkey and the USA. As was stated before, the data in Turkey were collected by the researcher. On the other hand, the USA sample came from MIST project which middle-school mathematics and the institutional setting of teaching are being studied.

In Turkey, the target population is in-service elementary mathematics teachers who were teaching at the grades 5th to 8th at 2013-2014 academic year in Ankara. Six central districts of Ankara were selected for the study. The accessible population includes 1380 in service elementary mathematics teachers in Ankara at 2013-2014 academic year in the six districts. Table 1 indicates the total number of teachers in the six districts and the number of teachers selected for the sample.

Table 1 Statistics of Districts of Ankara and Sample of the Study for Turkey

Name of District	**Number of Mathematics Teachers in Ankara**		**Number of Mathematics Teachers in the sample**	
Çankaya	353	16.90%	73	19.26%
Etimesgut	168	8.04%	80	21.10%
Keçiören	341	16.33%	97	25.59%
Pursaklar	63	3.01%	48	12.66%
Sincan	173	8.28%	33	8.70%
Yenimahalle	282	13.50%	44	11.60%
			4	1.05%
Total	1.380	100 %	379	100 %

As seen in Table 1, 379 selected middle school mathematics teachers is almost 27 % of the total number of teachers in Ankara, Turkey. In selecting the middle school mathematics teachers for the sample of the study, the researcher first got permission from the administration of each school to apply the survey. Schools were selected

randomly. After getting permission from the school administration, the survey was administered individually to all in-service middle school mathematics teachers who were volunteers to fill the survey in the selected school. The Table 1 above indicates the number of in-service middle school mathematics teachers who were willing to fill out the survey and return the survey to the researcher during the data collection process.

Detailed statistics of the target Turkish population of all middle school teachers of the study were given at Appendix A according to Ministry of National Education Statistics (2013). Researcher determined these districts of Ankara, Turkey purposively. These districts were main districts of the Ankara, Turkey. Their locations were easily reachable by the researcher. Population and sample were given in detail at the above Table 1. Turkish sample was 379 in-service middle school mathematics teachers teaching at Ankara, the capital city of Turkey, during the 2013-1014 academic year. The sample was selected using a purposive sampling method. Teacher Survey was administered to 400 middle school mathematics teachers in six urban districts of Ankara: Çankaya, Keçiören, Pursaklar, Yenimahalle, Etimesgut, and Sincan. Some of the in-service middle school mathematics teachers did not want to fill the survey. The response rate was approximately 95%. Representativeness of the districts in the population and sample districts were given at Table 1.

Detailed statistics of the target USA population off all middle school tachers of the study were given in Appendix A according to U.S. Department of Education, National Center for Education Statistics (2010) (as cited in Rosenquist, 2014).USA sample were determined by Middle-school Mathematics and the Institutional Setting of Teaching (MIST) project. It is a longitudinal mathematics education study of institutional supports for improved middle school mathematics instruction in four urban school districts (Cobb & Smith, 2008). Within each of the four large urban school districts, six to ten middle schools were selected purposefully to construct a sample of middle schools which reflected the school-level variation of student demographics and achievement within each district (Rosenquist, in press) The project then randomly selected up to five mathematics teachers at each school and invited their participation (Katterfeld, 2013). Each district contributed approximately

the same number of teachers. Teachers recruited for participation in the project. When a teacher left the school or study, another teacher from the same school was chosen at random and recruited to maintain the same number of participants (Rosenquist, in press). Teacher Survey administered to 245 middle school mathematics teachers electronically. Data were collected in 2007-2013 academic years.

The analysis of the study based on 379 Turkish in-service middle school mathematics teachers and 245 American in-service middle school mathematics teachers. The gender distribution of the samples was documented in the Table 2. As seen in Table 2, with respect to gender two samples have similar distributions.

Table 2 Gender Distributions of USA and Turkey in-service middle school mathematics teachers

	Turkey		**USA**	
Gender	**Frequency**	**Percentage %**	**Frequency**	**Percentage %**
Female	279	73.2	171	69.8 %
Male	100	26.2	69	28.2 %
Total	379	100	245	100

Age distributions of teachers were given at Table 3 to show that these two samples have similar properties. For Turkish sample, 340 (89.7 %) teachers wrote their age 39 (10.3%) of them did not write their age and for USA sample, 237 (96.7%) of teachers wrote their age at survey but 8 (3.3%) of them did not write their age. As seen in Table 3, age properties of the samples are similar to each other.

Table 3 Age Distributions of Turkey and USA in-service middle school mathematics teachers

Age Interval	**Turkey**		**USA**	
	Frequency	**Percentage %**	**Frequency**	**Percentage %**
Between 20-28	96	38.35 %	35	14.76 %
Between 30-39	150	44.17 %	97	40.92 %
Between 40-49	74	21.76 %	74	31.22 %
Between 50-59	5	1.47 %	38	16.03 %
Between 60 and older	15	4.41 %	13	5.48 %

3.3 Instrumentation

As was stated previously, this research aims at comparing Turkish and American middle school in-service mathematics teachers' self-efficacy, and the relationship of teacher related factors, such as teacher-teacher respect, collective efficacy, use of tools, de-privatization, teacher-teacher feedback, collaboration and school related factors such as principal feedback to teacher, principal assist to teacher, teacher trust in principal, instructional leadership, teacher accountable to teacher with the self-efficacy measure of the in-service middle school mathematics teachers. The Middle-school Mathematics and the Institutional Setting of Teaching (MIST) scale was designed for the American in-service middle school mathematics teachers and assesses the levels of teachers' participation in learning communities and informal networks, their propensity to seek instructional advice, the degree to which interactions between teachers in these learning communities and networks focus on central mathematical ideas, the degree to which teachers informal and formal leaders have a shared vision for mathematics instruction and the degree to which instructional leadership is distributed among informal and formal leaders and the professional development that teachers have received in support of improved instructional practices in mathematics ("MIST dissemination", 2015). Thus, the scale seems covering the variables considered in the present study. It was decided to have the scale translated into Turkish language and culture for the comparisons between American and Turkish teachers.

The survey which was used for data collection was translated and adopted version of the MIST Teacher Survey which was developed by researchers who conducted MIST project. Demographic part was added by the researcher to Turkish version of MIST teacher survey.

3.3.1 Development of MIST Teacher Survey

MIST teacher survey designed to assess teacher related factors and school related factors as stated above. Researchers of MIST project developed the teacher survey based on the existing literature. They conducted a comprehensive review of existing surveys but they were able to identify only a small number of items that are appropriate for the MIST project purposes. In the literature, teacher surveys were

divided into 2 two categories (Cobb and Smith, 2008). These are surveys developed by mathematics educators, and surveys developed by researchers in policy and leadership. Surveys developed for mathematics teachers basically focus on instructional practices on the other hand, some of the surveys developed to focus on institutional practices. Thus, MIST team developed a new instrument which covered instructional practices and institutional practices as leadership, policy implications at the same time.

MIST team both took some of the items previously used in other studies and produced new items in order to match the theoretical framework and the items in the dimensions of self-efficacy, teacher-teacher respect, collective efficacy, use of tools, de-privatization, teacher-teacher feedback, collaboration, principal feedback to teacher, principal assist to teacher, teacher trust in principal, instructional leadership, teacher accountable to principal, professional development. These dimensions and items of these dimensions were evaluated by external reviewers. External reviewers went through six iterations as they culled and revised the items. They submitted the items to rounds of review. They conducted cognitive interviews with mathematics teachers and experts to inform the improvements of the items After all these processes; teacher survey was administered to teachers in USA.

3.3.2 Turkish version of MIST Teacher Survey

MIST teacher survey was used at the study to collect data from Turkish in-service mathematics teachers. Before translating the MIST teacher survey into Turkish language, couple of different changes has been made. The original scale includes items related to teachers' relations with mathematics coaches. In addition, in the original scale there are questions about having teacher certificate or not and taken courses related to mathematics. Since these are not valid in the Turkish educational system, they were not considered in the translation and adaptation process. Instead some additional questions were added to the Turkish version, such as level of education, years of experience, years of experience at the school, level of working condition, grades taught, number of working hours to demographic information part. These background items were adapted from OECD's TALIS study.

The original MIST scale is a multidimensional instrument assessing various teacher and administration related variables. The first dimension contains items about teachers' gender, age, years of experience, level of education, and weekly teaching hours of in-service middle school mathematics teachers. Second dimension which is named as self-efficacy is the modified short version of Teachers Sense of Self-efficacy Scale (TSES) (Tschannen-Moran & Woolfolk- Hoy, 2001). The TSES is a Likert-type scale with 9 point response categories as, not at all, very little, somewhat, quite a little, a great deal. Self-efficacy consists of "efficacy for instructional strategies" (SE for IS), "efficacy for classroom management" (SE for CM), and "efficacy for student engagement" (SE for Engagement). Instructional strategies includes items related weather teachers provide alternative explanations in the classroom and implementation of alternative teaching strategies. Classroom management includes items related to weather teachers control the disruptive behavior in the classroom and calm down the students, student engagement has items related to weather teachers motivate students in their classroom. There are 12 items in these dimensions respectively. Items modifications made based on domain-specific as mathematics.

Third general dimension is related "teacher-teacher respect" (respect), "collective efficacy" (positive CE and negative CE), and "use of tools" (tools). Items of the "teacher-teacher respect" and "collective efficacy" are Likert-type scales with 5-point response categories such as strongly agree, agree, neither agree nor disagree, disagree, strongly disagree. Items of the "use of tools" are frequency scale with 5-point response categories such as never, 1-2 times, 3-5 times, 6-10 times, more than 10 times. There are 6 items at the teacher-teacher respect dimension. There are 11 items at the collective efficacy dimension. These items of "use of tools" were common core mathematics program 2 student book, common core mathematics program 2 teacher's Manual, Unit planning Guide, Curriculum maps, RTI maps, Curriculum Frameworks. There are 6 items at use of tools dimension.

Fourth general dimension is about in-service middle school mathematics teachers' interactions with other mathematics teachers in their schools. Dimensions related to this dimension as "de-privatization" and "teacher-teacher feedback". Items of the de-

privatization are Likert-type scale with 5-point response categories such as strongly agree, agree, neither agree nor disagree, disagree, strongly disagree. There are 5 items at this dimension. Items of the "teacher feedback" is a frequency scale with 5-point response categories such as never, 1-2 times, 3-5 times, 6-10 times, more than 10 times. There are 4 items at this dimension.

Fifth general dimension is related to in-service middle school mathematics teachers' interaction with their administrator. Dimensions related to this dimension are "principal feedback to teacher", "principal assist to teacher", "teacher trust in principal", "instructional leadership", "teacher accountable to principal". "Principal feedback" (Feedback) to teacher is a frequency scale with 6 point response categories as never, 1-2 times, 3-5 times, 6-10 times, 11-20 times, more than 20 times. There are 7 items at this dimension. "Principal assist to teacher" (Assist) is a frequency scale with 4 point response categories as never, rarely, sometimes and often. There are 13 items at this dimension. "Teacher trust in principal" (Trust) and "instructional leadership" (Leadership) are Likert-type scale with 5-point response categories such as strongly agree, agree, neither agree nor disagree, disagree, strongly disagree. There are 14 items at the "Teacher trust in principal" dimension and there are 10 items at the "instructional leadership" dimension. "Teacher accountable to principal" (Account) is a frequency scale with 4-point response categories as not at all, to a small extent, to a moderate extent and to a great extent. There are 11 items at the "Teacher accountable to principal" dimension.

Sixth general dimension is about in-service middle school mathematics teachers' professional development. First item (S27) of that part has two dimensions as "topic addressed" and "topic impacted my instruction" with 4-point scale, not at all, to a small extent, to a moderate extent and to a great extent. This item has 12 sub-items but at total there is 24 sub-items. These items were related with "professional development" dimension. "Professional development" is a frequency scale with 4-point response categories as not at all, to a small extent, to a moderate extent and to a great extent. Second item (S28) of that part was related with "quality of professional development" which was attended by in-service middle school mathematics teachers during the academic year. These eight sub-items is 5-point Likert scale as strongly disagree, disagree, neither disagree nor agree, agree, strongly agree.

Seventh dimension is about in-service middle school mathematics teachers' professional network in their school. The item (S29) with ten sub items related with the "collaboration" dimension. "Collaboration" (CollaInst, CollaStudent and CollaClass) is a dichotomous scale with 2 point response categories as yes and no. There are 10 items at collaboration dimension.

The seven dimensions explained above could be grouped under two overarching dimensions such as teachers' perceptions about themselves and others (TPTO), and teachers' perceptions about school administration (TPSA). In the statistical analysis in order to keep the sample size large enough, these two dimensions were treated separately. Thus, the dimensions of teacher-teacher respect, use of tools, collective efficacy, de-privatization, teacher-teacher feedback and collaboration were treated under TPTO, and dimensions of principal feedback to teacher, principal assist to teacher, teacher trust in principal instructional leadership, teacher accountable to principal were treated under TPSA.

3.3.3 Translation of MIST Teacher Survey

MIST teacher survey developed by MIST team in English. MIST teacher survey was used to collect data in the study. To make comparison across cultures with two different languages, the scale was translated into Turkish. The original scale was developed with 70 subscales; but, due to the suitability of the questions to the nature of the cross-cultural comparisons, 29 sub-scales with 141 items were used in the study. Translation fidelity of the scale is important for a fair comparison across the cultures (Hambleton, 1993; 1994). Thus, for achieving translation fidelity a strict iterative process was used by the researcher. In the translation process, the forward translation method was used. In this method, the original scale is translated into the target language and then bilinguals are asked to compare the original version with the adapted version (Hambleton, 1993; 1994). In the present study, the source language is English and the target language is Turkish. In line with the forward translation method, the following steps were followed during the translation process. International Test Commission's (ITC) Guidelines for Translating and Adapting Tests were used during the translation process. ITC guidelines were given at Appendix J.

3.3.3.1 The steps of the Translation Process

1. Three independent academicians translated the MIST survey from English to Turkish independently. The first academician is the researcher herself. One of the translators was a doctoral student at one of the leading Turkish universities where the medium of instruction is in English. She was English language teacher with master degree from Foreign Language Education Program of one of the leading university at in Turkey. She is bilingual researcher and familiar with the characteristics of both American and Turkish cultures. She was working as an instructor at English language teaching department at the one of leading public universities. Second translator was also at in the doctoral program at one of the leading universities in Turkey and she is working as an instructor at elementary education department of the one of the leading private universities. She completed her master study at the in elementary education department. Her undergraduate study was in English. She is bilingual researcher and familiar with the characteristics of both American and Turkish cultures.(Guidelines D1 and D5)
2. The translated items were evaluated by another instructor. In this evaluation, the translated items produced by three independent translators were evaluated with respect to the original versions. The items with the closest meanings to the original scale were identified during this process. In this evaluation, several modifications were carried out in line with the content of the Turkish version of MIST survey. (Guidelines C2, D1, D2, D5 and D8)
3. Some of the terminologies were not used at the Turkish version because their content was not appropriate to Turkish education system. These were; (1) Mathematics coach is not available at Turkish Education System. Instead of that terminology, chair of mathematics department, which was "matematik zümre başkanı", was used. (2), instead of using CMP2, which is a curriculum based on common core standards at USA, researcher used curriculum. The reason of this change is that Turkish Education System is a centralized national system with national curriculum frameworks. At the middle schools, course books were written by the Ministry of National Education and there is

a standard book which whole schools are using a student book, students' workbook, teacher book. There are some supplementary books which were written by the writers and teachers, teachers are free to use these supplementary materials at their classrooms. Instead of using CMP2 textbook, researcher used "ders kitabı". CMP2 Teachers' Manual was translated as "Öğrenci Çalışma Kitabı". "Curriculum Frameworks" as "müfredat" and "Curriculum Based Assessments" as "yardımcı kitaplar" and "Öğretmen Kitabı". Lastly, "Professional Development" was translated as "hizmet içi eğitim, seminer". (3) The item 6f, "Drug and alcohol abuse in the community make learning difficult for students here." and math coach part (items 11, 12, 13, 14, 15) were deleted. The reason of deleting these items is that there is no report showing drug and alcohol abuse at the elementary schools and there is no math coach at the elementary schools. (4) At the demographic information part, the item related to ethnicity was deleted and the teachers' demographics information part was taken from the OECD Teaching and Learning International Study (TALIS) study which covers teachers working hours, working status, occupation years, working years at the same school, education level, gender. (Guidelines D4, C1, C2)

4. After revising the item translations and use of terminologies, the final version of the Turkish version of MIST teacher survey was further evaluated by a group of twenty experts with respect to language, grammar, sentence, and appropriateness of the content to in-service middle school mathematics teachers in Turkey. In this process, there had been still some minor modifications about the clarity of sentences, grammar and punctuation. (Guidelines D5)
5. In the final step of translation fidelity, cognitive interviews with 6 in-service mathematics teachers were carried out to check whether there were problems in line with the meanings of items. No modifications were made after cognitive interviews. Cognitive interviews were carried out by the researcher. (Guidelines D5)
6. The final version of the Turkish MIST survey was adequate for the pilot study. (Guidelines D8)

3.3.4 Piloting the Turkish version of MIST Teacher Survey

Ethics board of the METU checked Turkish version of the survey and then got the permission for the administration of the survey was taken firstly from Ethical Board of the METU and then from the National Ministry of Education. The pilot data were obtained through internet. The researcher prepared the online version of the Turkish MIST survey and 120 volunteer teachers filled out the survey at 2012- 2013 academic year. These teachers were members of middle school mathematics teaching electronic group. Volunteer teachers of that group filled the survey through online system (suvey.metu.edu.tr. The reliability of the test scores on 141 items was found as 0.81 in the pilot study. Reliability of the Turkish MIST teacher survey was considered as good so no modifications were made. Turkish version of MIST teacher survey was used to collect data for main study.

The Cronbach's alpha reliability for Turkish version of MIST was 0.947 and in American sample, the reliability was 0.95. In general, an adequate Cronbach's alpha is in the range of .70 to .79, a good Cronbach's alpha is in the range of 0.80 to .89, an excellent Cronbach's alpha is in the range of 0.9 to 1.0 (Cohen, 1988). Thus, survey generated acceptable internal consistencies to perform further analysis.

According to pilot study, percentage of attending professional development for Turkish mathematics teachers was so low. Almost, half of the teachers did not take any professional development. The items at that dimension were satisfied the conditions so these items were not deleted.

3.3.5 Item and Construct Equivalence

Item equivalence means that construct which is being measured is essentially same or parallel across both translation forms for each culture (Martin & Berberoğlu, 1991). If item equivalence cannot be established, researcher must argue that there are two separate tests, one for each culture (Hui, Triandis, 1985, p.184). Whenever sufficient numbers of the items equivalent across cultures, then meaningful comparisons may be made based on the test scores from the two translations of the

survey (Candell & Hulin, 1986, p.148). Therefore, researcher does not has to satisfy equivalency of all the items of a translated test across cultures.

Hui and Triandis (1985, p.133) stated that constructs with conceptual/ functional equivalence may be meaningfully discussed in both cultures. The requirements of the conceptual/ functional equivalence are exploratory factor analysis, item level analysis and measurement invariance analysis. The first group of analyses focuses on the factor structures of the MIST teacher survey across the samples by exploratory factor analysis. Second group analysis focuses on the item level analysis of the survey by item analysis. Last analysis is measurement invariance analysis that is run only for the self-efficacy construct of the survey.

3.4 Data Collection and Analysis

The Turkish MIST survey was administered by the researcher to volunteer Turkish in-service middle school mathematics teachers in the selected schools Ankara, Turkey. In-service middle school mathematics teachers were informed about the purpose of the study and data protection and ethics codes of the study.

USA data were collected via online web site in 4 different districts. In-service mathematics teachers were informed about the study and data collection and ethics codes of the study. As in the case of the Turkish sample, in the USA volunteer teachers were responded to the English MIST survey. This data were collected by the MIST study group during 2007-2013 academic years.

The data gathered from the MIST teacher survey was analyzed by SPSS and LISREL. First, data were coded into a SPSS file by researcher. Data were scanned for potential wrong entries. Descriptive statistics and frequency tables of the all items were checked for unusual values (wrong data entries). Missing value analysis was conducted. All missing values of the survey items were replaced by the mean of each item since the missing rates of the items were less than 20 % in Turkish and USA samples. Missing data of the teachers' background information section such as gender, birth date were not substituted by any value.

In cross-cultural research studies, there is a need to exploratory factor analysis to show that both the survey and constructs being measured are operating in the same way across the samples (Byrne & Van de Vijver, 2010). The data was analyzed through numerous exploratory factor analyses to find factor structure of the MIST survey across the samples.

A bivariate regression analysis was conducted using TSES (student support and classroom management) total scores as the dependent variables and the other scores as the independent (or predictor) variables to determine the relationship between the in-service middle school mathematics teacher self-efficacy scores, and the teacher perceptions about themselves and other and teachers' perceptions about school administration variables.

MANOVA checks the hypothesis that the population means for the dependent variables are equal for all levels of factors across all groups (Green & Salkind, 2007). Multivariate analysis of variance (MANOVA) was run to determine the effect of teacher perceptions about themselves and others and teacher perceptions about school administration on the self-efficacy scores of in-service mathematics teachers across samples.

3.5 Missing Data Analysis

Missing values were scattered randomly at the survey except sixth general dimension of MIST teacher survey. Items missing rate were below 20 % at samples. To deal with missing responses two methods were applied to data: mean replacement and linear trend at a point. Results of the methods were almost same, descriptive tables of the countries were given at Appendix H. Therefore, researcher decided to replace missing values by mean of each item.

Sixth general dimension of the MIST teacher survey was professional development. There are 30 items related to professional development of mathematics teachers. Turkish sample-missing responses were non-randomly (Tabachnick, Fidell, 2007) so sixth general dimension was not used in study due to the high non-randomly missing rate.

3.6 Effect Sizes

Effect size indicates the degree of relationships among two or more variables (Stevens, 2002). The squared multiple correlation coefficients (R^2) are used for measuring effect sizes in correlational studies. The classification for effect sizes in terms of R^2 as; R^2 = 0.001 is small, R^2=0.09 is medium, and R^2=0.25 is large effect size which was suggested by Cohen (1988). The classification for standardized path coefficients (R) for interpreting the effect sizes of the relationships where absolute values of the path coefficients that are less than 0.10 are considered small, 0.30 as medium and greater than 0.50 as large effect sizes (Cohen, 1988).

CHAPTER 4

RESULTS

This chapter presents the apriori analyses for the equivalency of the scale used across the countries and the main results of the study. The equivalency includes item level analyses to prove that the scale functions similarly across the countries. In this respect item level data were studied for construct and item equivalencies. The results contain mean comparisons for the middle school mathematics teachers' self-efficacy between Turkey and USA and regression analysis.

4.1 Apriori Analysis of Construct and Item Equivalencies

4.1.1 Exploratory Factor Analysis (EFA) of MIST Teacher Survey

MIST was designed to "measure the levels of teachers' participation in informal networks and learning communities, their propensity to seek instructional advice, the degree to which interactions between teachers in these learning communities and networks focus on central mathematical ideas, the degree to which teachers informal and formal leaders have a shared vision for mathematics instruction and the degree to which instructional leadership is distributed among informal and formal leaders and the professional development that teachers have received in support of improved instructional practices in mathematics" (MIST dissemination, 2015).

141 items of MIST teacher survey, which were appropriate for Turkish culture, were used in the study. These items can be grouped under two sections within each

section, there are also sub-dimensions dealing with teachers' perceptions about themselves and other teachers, and teachers' perceptions about school administration.

Within each part, MIST has different sub-dimensions. In the first part, There are 12 items about self-efficacy of teachers with respect to (instructional strategies, student engagement and classroom management), 6 items about teacher-teacher trust, 11 items about collective efficacy (positive collective efficacy and negative collective efficacy), 6 items about "use of tools", 5 items about "de-privatization", 4 items about "teacher-teacher feedback", 8 items about "collaboration for student development" and "collaboration for instruction". In the second part, there are 7 items about "principal feedback to teacher", 13 items about "principal assist teacher", 14 items about "teacher trust in principal", 10 items about "instructional leadership" and 11 items about "principal account to teacher". In the present study, these dimensions were treated as sub traits of MIST teacher survey.

This study aims to compare teacher efficacy across Turkish and American in-service middle school mathematics teachers. The comparisons across cultures require the scales which should function in the similar way across the USA and Turkey. The first group of analyses focuses on the factor structures of the MIST teacher survey across the samples (Jöreskog, 1971; Byrne & van de Vijver, 2010).

As was said before, MIST teacher survey has two sets of items. The first set of items are related with teachers' perceptions about themselves and their colleagues at their school. The second set of items are related with teachers experience with the school administration. EFA was conducted separately for two set of items as teacher related items and school administration related items. The first main reason of dividing MIST teacher scale into two parts is that sample size for running EFA was not enough for Turkey and USA. Second reason is that conceptually MIST teacher survey items can be grouped under two main parts. MIST teacher survey assesses teacher perceptions about themselves and other and their perceptions about school administration (formal and informal instructional leaders).

EFA was employed to determine the dimensions of MIST teacher survey based on the conceptual framework of the MIST. To determine dimensions of self-efficacy, teacher-teacher trust, collective efficacy, use of tools, de-privatization, teacher-teacher feedback, and collaboration EFA analyses were run for TPTO, which is teacher perceptions about themselves and others. Dimensions, principal assist teacher, principal account teacher, teacher trust in principal, instructional leadership and teacher accountable to principal were used for running EFA for TPSA, which is teacher perceptions about school administration.

Principal axis factoring method with Varimax rotation was carried out by the computer program SPSS 22.0 for Windows to group and lessen the number of observed variables with respect to the common shared variance.

4.1.1.1 EFA of Teacher Perceptions about Themselves and Others (TPTO) of MIST Teacher Survey for Turkey

MIST TPTO, teacher perceptions about themselves and others, has 54 items. Due to having more than 20 % missing rate, 8 items (Deprivati_b, Tools_c, d, e, f, Feedback_d, and Colla_i, J) were not included in the EFA. Remaining 46 of the items except the deleted 8 items was included in the exploratory factor analysis. These items' stems, response alternatives with their numerical descriptions, and descriptive statistics were given at the Appendix D for the 379 Turkish in-service middle school mathematics teachers.

The Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were examined whether the data gathered were suitable for EFA. KMO index was 0.872 which is in the range of 0.80 and 0.89 and defined as meritorious (Kaiser, 1974). The Bartlett's Test of Sphericity was 7910.733 ($p=0.000$, $p< 0.05$). The indexes showed that the data were suitable for running EFA since distribution is multivariate normal and correlation matrix is not an identity matrix (George & Mallery, 2001).

The dimensionality of TPTO in MIST scale in the Turkish sample was studied by Scree test. As seen in Figure 2, TPTO of the MIST scale revealed at least 11 factors as endued by the Kaiser Criterion and the point where the scree plot levels off. Thus, based on the Scree test results 11 factors were interpreted in the Turkish sample.

Table 5 indicates the factor loadings of the items in the first part of the MIST scale in the Turkish sample.

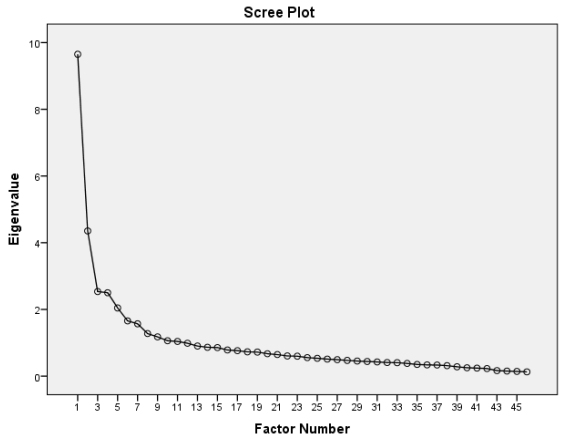


Figure 2 Scree Plot of Factors of TPTO of MIST Teacher Survey in Turkey

The eigenvalues, the percentage, and the cumulative percentages of these ten factors were given in Table 4. In total, the eleven factors with 46 items accounted for 51.561 % of the total variance.

Table 4 Rotation Sums of Squared Loadings of TPTO of the MIST Teacher Survey in Turkey

	Rotation Sums of Squared Loadings		
Name of Constructs	**Eigenvalue**	**% of Variance**	**Cumulative %**
Teacher-Teacher Respect	4.812	10.460	10.460
Student Support	3.977	8.646	19.107
Positive Collective Efficacy	2.422	5.266	24.373
Teacher-teacher Feedback	2.214	4.813	29.186
Negative Collective Efficacy	2.002	4.353	33.539
Classroom Management	1.868	4.060	37.599
De-privatization	1.777	3.862	41.462
Collaboration for Student Development	1.619	3.520	44.981
Use of Tools	1.427	3.102	48.084
Collaboration for Instruction	1.094	2.378	50.462
	.506	1.099	51.561

The 10 factors were interpreted in line with the conceptual framework and the content of the items. As seen in Table 5, factor loadings support the conceptual framework of the MIST teacher survey in TPTO.

Table 5 Factor Loadings of TPTO of the MIST Teacher Survey in Turkey

Item	**Factor Loadings**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
T_respect_c	**.868**	.142	.101		.148			.146			-.151
T_respect_b	**.866**							.112			
T_respect_a	**.862**		.148				.124				
T_respect_f	**.764**	.128			.115		.206	.121			.207
T_respect_e	**.753**						.255		.102		.213
T_respect_d	**.731**						.181	.118			
SSupport _k	.134	**.664**	.284								-.101
SSupport_d		**.654**	.177			.135					-.140
SSupport_g	.130	**.629**	.177	.134		.169	.106				
SSupport_j		**.599**			.152						.151
SSupport_i		**.592**	.162			.208	.118				
SSupport_l		**.558**	.270	.123		.142					
SSupport_e	.116	**.519**			.223						.150
SSupport_b		**.454**	.238	.108		.283	.184				
PositiveCE _a	.118	.194	**.701**								-.132
PositiveCE _e		.217	**.591**	.102							
PositiveCE _b	.180	.198	**.586**								.137
PositiveCE _j	.151		**.480**		.254		.228				.113
PositiveCE _d		.113	**.437**		.194	.117					
T_Feedback _a			.130	**.892**							
T_Feedback_c				**.891**							
T_Feedback_b		.124		**.705**							
NegativeCE _i	.168	.147			**.655**	.212	.150				
NegativeCE _k	.191	.209			**.593**		.184				
NegativeCE_g			.146		**.483**						
NegativeCE_h		.176	.192		**.471**	.113	.280				-.123
PositiveCE_f		.273	.353		**.375**		.152			.116	
PositiveCE_c	.311	.155	.320		**.343**		.187				**.322**
ClassMan_a		.324	.121			**.660**		-.128		.119	
ClassMan_h	.178	.471	.129		.102	**.638**					
ClassMan_f		.447			.188	**.606**					
ClassMan_c		.377	.125		.173	**.520**		.148			

Table 5 (Continued)

Item	Factor Loadings										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Deprivati_d	.340	.222	.158		.235		**.585**			.106	
Deprivati_a	.373	.150	.114		.115	.117	**.570**	.144			
Deprivati_c	.385	.116	.130		.188		**.559**				
Deprivati_e	.205	.116					**.470**	.132			
CollaStudent _b								**.634**			
CollaStudent _e								**.620**		.121	
CollaStudent _d								**.333**			
CollaStudent _a	.187				.164		.201	**.312**		.165	
CollaStudent _c	.113							**.311**		.158	
Tools _a									**.854**		
Tools _b			.102					.103	**.762**		
CollaInst _g								.288		**.667**	
CollaInst _h								.318	.148	**.472**	.196
CollaInst _f								.375		**.467**	-.138

10 the factors represents the dimensions of "teacher-teacher respect" (T_respect), "student support" (SSupport), "positive collective efficacy" (PositiveCE), "teacher feedback"(T_Feedback), "negative collective efficacy" (NegativeCE), "de-privatization" (Deprivati), "classroom management", (ClassMan) "collaboration for student management" (CollaStudent), "use of tools" and "collaboration for instruction" (CollaInst). As seen in Table 5, only one item (PositiveCE_c) loaded in the 11th factor with a moderate loading. This particular item is also loaded on factor 5. This item treated as loaded on factor 5 because of that reason 11th factor was not named.

4.1.1.2 EFA Teacher Perceptions about Themselves and Others (TPTO) of MIST Teacher Survey for USA

MIST TPTO, teacher perceptions about themselves and others, has 54 items. Due to having more than 20 % missing rate, 8 items (Deprivati_b, Tools_c, d, e, f, Feedback_d, and Colla_i, j) were not included in the EFA. Remaining 46 of items except the deleted 8 items was included in the analysis. These items' stems, response alternatives with their numerical descriptions, and descriptive statistics were given at

the Appendix E for the 245 American in-service middle school mathematics teachers.

The Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were examined whether the data gathered were suitable for EFA. KMO index was 0.845, which is in the range of 0.800 and 0.89 and defined as meritorious (Kaiser, 1974). The Bartlett's Test of Sphericity was 6046.339 ($p=0.000$, $p< 0.05$). The indexes showed that the data were suitable for running EFA since distribution is multivariate normal and correlation matrix is not an identity matrix (George & Mallery, 2001).

The dimensionality of the TPTO of the MIST scale in the American sample was studied by Scree test. As seen in Figure 3, TPTO of the MIST scale revealed at least 11 factors as based on Kaiser Criterion and the point where the scree plot levels off. Thus, based on the Scree test results 11 factors were interpreted in American sample. Table 7 indicates the factor loadings of the items in the first part of the MIST scale in the American sample.

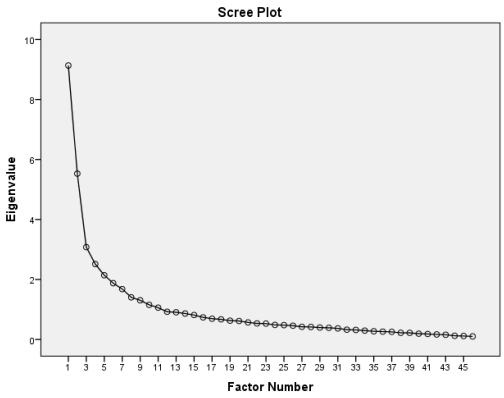


Figure 3 Scree Plot of Factors of TPTO of MIST Teacher Survey in USA

The eigenvalues, the percentage, and the cumulative percentages of these eleven factors were given at Table 6. In total, the eleven factors with 46 items accounted 57.114 % of the total variance.

Table 6 Rotation Sums of Squared Loadings TPTO of MIST Teacher Survey in USA

Name of Constructs	Eigenvalue	% of Variance	Cumulative %
Teacher-teacher Respect with De-privatization	5.783	12.571	12.571
Student Support	4.544	9.878	22.449
Classroom Management	2.664	5.791	28.240
Positive Collective Efficacy	2.595	5.642	33.882
Collaboration for Instruction	2.059	4.477	38.358
Negative Collective Efficacy	1.951	4.241	42.599
Use of Tools	1.775	3.859	46.458
Teacher-teacher Feedback	1.750	3.803	50.262
Collaboration for Student Development	1.179	2.563	52.824
	1.016	2.209	55.033
Collaboration for Classroom	.971	2.111	57.144

The 10 factors were interpreted in line with the conceptual framework and the content of the items. As seen in Table 7 factor loadings support the conceptual framework of the MIST teacher survey in TPTO.

Table 7 Factor Loadings of TPTO of MIST Teacher Survey in USA

	Factor Loadings										
Item	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
T_respect_c	**.876**					.170					
T_respect_b	**.876**										
T_respect_f	**.840**			.120		.100				.111	
T_respect_e	**.838**					.173					
T_respect_a	**.818**					.109			.117		
T_respect_d	**.771**									.135	
Deprivati_c	**.645**				.164	.279			.168	.345	
Deprivati_a	**.479**					.177		.124	.105	.288	
Deprivati_d	**.446**			.203	.119		.123			.411	
SSupport_g		**.727**	.276	.199	.185					.169	
SSupport_d		**.722**	.179	.318	.117						
SSupport_i		**.721**				.122			.233	-.145	
SSupport_j	.121	**.712**	.147	-.102		.173				-.133	
SSupport_l		**.666**	.116			.162		-.132		.107	
SSupport_b		**.664**	.257	.287		-.105					
SSupport_k		**.622**		.124			.151		.107	.187	

Table 7 (Continued)

Item	Factor Loadings										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
SSupport_e		**.509**	.291			.229					
ClassMan_a		.307	**.802**	.122							
ClassMan_f		.373	**.730**	.250							
ClassMan_c		.324	**.728**	.129							
ClassMan_h		.510	**.619**	.169				-.106			
PositiveCE_a	.112		.195	**.812**							
PositiveCE_d		.114	.193	**.612**		.135					
PositiveCE_b	.257			**.566**			.110	.108			
PositiveCE_c	.346	.259		**.478**	.166	.281		.220			
PositiveCE_f	.236	.205		**.476**	.181	.275					-.134
PositiveCE_e		.134	.121	**.356**		-.108					
CollaInst_h		.113			**.760**						
CollaInst_g	.129				**.742**				.232		
CollaInst_f					**.648**				.110		.266
NegativeCE_k	.280		.102			**.652**		.104			
NegativeCE_i	.261	.166	.113	.206		**.529**				.141	
PositiveCE_j	.278	.101		.194	.163	**.509**	.110			.119	
NegativeCE_h	.305	.181				**.476**					
NegativeCE_g			.292	.176		**.295**				.118	.223
Tools_a						.107	**.940**				
Tools_b	-.105			.170			**.862**				
T_Feedback_a								**.840**			
T_Feedback_c								**.669**			
T_Feedback_b								**.601**			.101
CollaStudent_a					.108				**.593**		
CollaStudent_c		.153			.146				**.519**		.146
CollaStudent_b					.307				**.416**		.158
Deprivati_e	.208					.224			.147	**.582**	
CollaStudent_d			-.136		.198			.190	.172		**.627**
CollaStudent_e					.297				.239		**.541**

10 factors represents the dimensions of “teacher-teacher respect with deprivatization” (T_respect and Deprivati), “student support” (S_Support), “classroom management” (ClassMan), “positive collective efficacy” (PositiveCE), “collaboration for instruction” (CollaInst), “negative collective efficacy”

(NegativeCE), “use of tools” (Tools), “teacher teacher feedback” (T_Feedback), “collaboration for student development” (CollaStudent) and “collaboration for classroom” (CollaStudent). As seen in Table 7, only one item (Deprivati_e) loaded in the 10th factor with a moderate loading, this factor was not named and used since there is only one item at this factor.

4.1.1.3 EFA of Teacher Perceptions about School Administration (TPSA) of MIST Teacher Survey for Turkey

MIST TPSA, teacher perceptions about school administration, has 55 items. Due to having more than 20% missing rate, 3 items (Leadership_b, Leadership_e, Account_d) were not included in the EFA. Remaining 52 of these items, except deleted three items, were included in the analysis. These items’ stems, response alternatives with their numerical descriptions, and descriptive statistics were given at the Appendix F for the 379 Turkish in-service middle school mathematics teachers.

The Kaiser-Meyer-Olkin (KMO) and Bartlett’s Test of Sphericity were examined whether the data gathered were suitable for EFA. KMO index was 0.934 that is above the value 0.900 and defined as excellent (Kaiser, 1974). The Bartlett’s Test of Sphericity was 14933.484 ($p=0.000$, $p< 0.05$). The indexes showed that the data were suitable for running EFA since distribution is multivariate normal and correlation matrix is not identity matrix (George & Mallery, 2001).

The dimensionality of the TPSA of the MIST scale in the Turkish sample was studied by the Scree test. As seen in Figure 4, TPSA of the MIST scale revealed at least nine factors as based on Kaiser Criterion and the point where the scree plot levels off. Thus, based on the Scree test results nine factors were interpreted in the Turkish sample. Table 9 indicates the factor loadings of the items in the second part of the MIST scale in the Turkish sample.

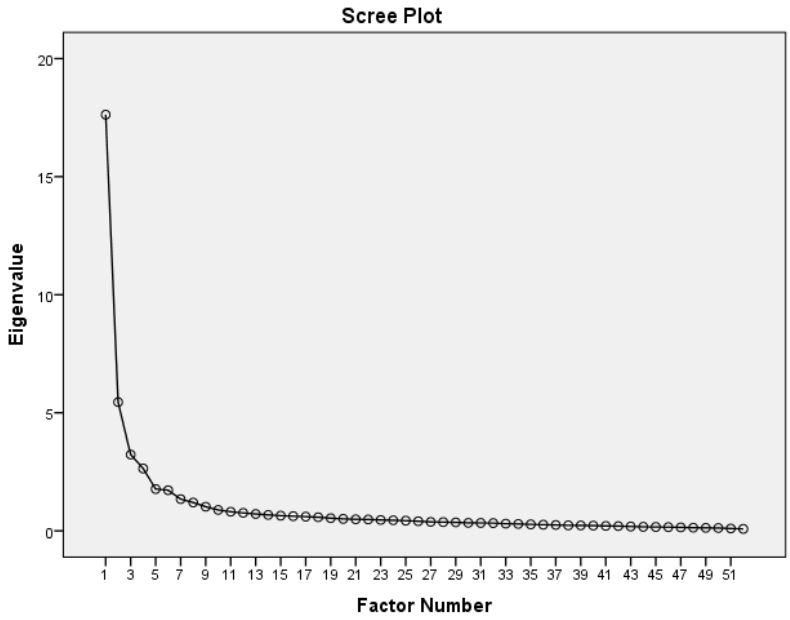


Figure 4 Scree Plot of Factors of TPSA of MIST Teacher Survey in Turkey

The eigenvalues, the percentage and the cumulative percentages of these nine factors were given in Table 8. In total, the nine factors with 52 items accounted for 62.951% of the total variance.

Table 8 Rotation Sums of Squared Loadings of TPSA of MIST Teacher Survey in Turkey

Name of Constructs	Eigenvalue	% of Variance	Cumulative %
Teacher Trust Principal	7.454	14.334	14.334
Principal Assist Teacher	6.687	12.860	27.193
Principal Feedback Teacher	4.400	8.461	35.655
Instructional Leadership	3.704	7.124	42.779
Teacher Account to Principal	3.230	6.211	48.990
Principal Observation	2.982	5.734	54.724
Teacher Account to Principal for Instruction	2.284	4.393	59.117
	1.088	2.093	61.210
	.905	1.741	62.951

The nine factors were interpreted in line with the conceptual framework and the content of the items. As seen in Table 9, factor loadings support the conceptual framework of the MIST teacher survey in TPSA.

Table 9 Factor Loadings of TPSA of MIST Teacher Survey in Turkey

	Factor Loadings								
Item	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Trust_i	**.868**				.173	.135			
Trust_j	**.864**	.110				.139			
Trust_l	**.837**	.142				.141	.110		
Trust_g	**.803**				.148	.171			
Trust_h	**.795**	.118		.108	.121	.176			
Trust_n	**.791**	.159		.190	.140	.146			
Trust_k	**.759**	.129	.101	.220	.105	.215		.126	
Trust_m	**.636**	.181	.101	.355		.258	.111		
Leadership_i	**.545**	.156		.502	.215	.123			
Leadership_j	**.459**	.193		.377	.192				
Assist_g	.140	**.813**	.159	.155					-.305
Assist_h	.132	**.810**		.137	.112				-.295
Assist_f		**.789**	.216			.115	.169		
Assist_c		**.737**	.251						.318
Assist_e		**.710**	.236			.127	.145		
Assist_i	.179	**.662**	.161		.167			.127	-.208
Assist_b		**.658**	.253			.116	.194		**.406**
Assist_d	.165	**.636**	.209						.157
Assist_m	.236	**.573**	.133	.252	.196	.141		.318	
Assist_k	.138	**.564**	.166	.168	.122	.127		.521	
Assist_a	.196	**.558**	.235	.150				.188	.296
Assist_l	.162	**.521**	.168	.242		.125	.110	.488	
Feedback_c		.142	**.803**						
Feedback_f	.124	.300	**.744**		.105				.144
Feedback_g		.324	**.733**	.118					.150
Feedback_e		.281	**.712**			.125	.102		.180
Feedback_b			**.711**			.133	.106	.180	-.159
Feedback_d	.119	.253	**.702**	.153				.143	-.124
Feedback_a		.237	**.548**	.131					
Leadership_g	.238	.126	.152	**.703**	.139	.158	.223	.129	
Leadership_c	.394	.166	.126	**.672**	.178	.195			
Leadership_h	.356	.192	.199	**.600**	.158		.117	.121	
Leadership_d	.195	.175	.134	**.600**	.215	.275	.144		.103
Leadership_a	.397	.131	.102	**.533**	.231	.152			
Leadership_f	-.128		.179	**.334**	.274	.211			.153
Account_a	.190				**.707**			.110	
Account_b	.285			.235	**.653**	.157	.102	-.109	

Table 9 (Continued)

Item	Factor Loadings								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Account_c	.284	.149		.258	**.614**	.154	.244		
Account_j	.235	.131	.113	.297	**.535**	.164	.342		
Account_g		.103	.101		**.507**	.140	.199	.149	
Account_k	.188	.122		.257	**.493**	.145	.448		
Account_f	.203	.245		.154	**.442**		.337		.165
Trust_d	.376	.180		.265	.130	**.704**			
Trust_e	.362	.144	.116	.319	.190	**.697**			
Trust_f	.176	.130	.142	.123	.118	**.594**	.188		.112
Trust_c	.412	.172	.119	.179	.138	**.545**			
Trust_b	.199				.130	**.526**		.118	
Trust_a	.290	.179	.167	.189	.134	**.475**			.151
Account_h	.182	.122		.133	.308		**.745**		
Account_i		.131	.254		.148	.183	**.690**	.157	
Account_e		.145		.214	.323	.178	**.572**		.137
Assist_j	.202	.366		.237	.124			**.400**	

Eight factors represent the dimensions of "teacher trust principal" (Trust), "principal assist teacher" (Assist), "principal feedback to teacher" (Feedback), "instructional leadership" (Leadership), "teacher account to principal" (Account), "principal observation" (Trust), "teacher account to principal for instruction" (Account) in line with the conceptual framework. As seen in Table 9, only one item (Assist_j) loaded in the eighth factor with a moderate loading. This particular item also loaded on the second factor with moderate loading. There is only one item loaded on the eighth factor. Thus, this factor was not treated as a separate dimension in the analysis. Similarly, the ninth factor was not treated as a separate dimension and item "Introducing (or launching) a lesson (Assist_b)" which loaded on this dimension was considered in the second factor since the 9th dimension had the eigenvalue below 1.

4.1.1.4 EFA of Teacher Perceptions about School Administration (TPSA) of MIST Teachers Survey for USA

MIST TPSA, teacher perceptions about school administration, has 55 items. Due to having more than 20% missing rate, 3 items (Leadership_b, Leadership_e, Account_d) were not included in the EFA. Remaining 52 of these items, except

deleted three items, were included in the analysis. These items' stems, response alternatives with their numerical descriptions, and descriptive statistics were given at the Appendix G for the 245 American in- service middle school mathematics teachers.

The Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were examined whether the data gathered were suitable for running EFA. KMO index was 0.938, which is above the value 0.900 and defined as excellent (Kaiser, 1974). The Bartlett's Test of Sphericity was 12013.463 ($p=0.000$, $p< 0.05$). The indexes showed that the data were suitable for running EFA since distribution is multivariate normal and correlation matrix is an identity matrix (George & Mallery, 2001)

The dimensionality of the TPSA of the MIST scale in the American sample was studied by the Scree test. As seen in Figure 5, TPSA of the MIST scale revealed at least seven factors as based on Kaiser Criterion and the point where the scree plot levels off. Thus, based on the scree test results seven factors were interpreted in American sample.

Table 11 indicates the factor loadings of the items in TPSA part of the MIST scale in the American sample.

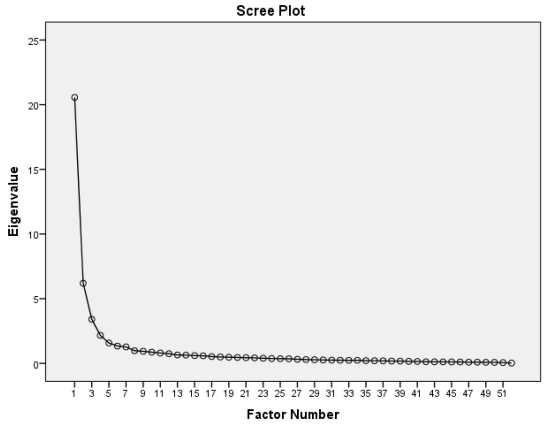


Figure 5 Scree Plot of Factors of TPSA of MIST Teacher Survey in USA

The eigenvalues, the percentage and the cumulative percentages of these nine factors were given at Table 10. In total, the seven factors with 52 items accounted for 65.537 % of total variance.

Table 10 Rotation Sums of Squared Loadings of TPSA of MIST Teacher Survey in USA

Name of Constructs	Eigenvalue	% of Variance	Cumulative %
Teacher Trust Principal and Instructional Leadership	12.110	23.289	23.289
Principal Assist Teacher	9.243	17.775	41.064
Teacher Account to Principal	4.496	8.646	49.709
Principal Feedback to Teacher	3.634	6.988	56.697
Principal Observation	1.923	3.698	60.395
Teacher Account to Principal for Instruction	1.406	2.704	63.099
	1.268	2.439	65.537

Seven factors were interpreted in line with the conceptual framework and the content of the items. As seen in the Table 11 factor loadings support the conceptual framework of the MIST teacher survey in TPSA.

Table 11 Factor Loadings of TPSA of MIST Teacher Survey in USA

	Factor Loadings						
Item	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Trust_i	**.882**	.178		.107			
Trust_j	**.875**	.144	.138	.161			
Trust_l	**.871**	.145	.156	.123			
Trust_g	**.848**				.145		
Trust_n	**.842**	.125	.113	.106			
Trust_k	**.838**	.166	.175	.147			
Trust_m	**.828**	.173	.128	.106	.104		.145
Trust_h	**.802**	.105			.237		
Trust_c	**.734**	.200			.224		
Leadership_c	**.707**	.264	.177	.131	.120	.181	.212
Leadership_i	**.704**	.126	.221	.124	.141	.169	.124
Leadership_h	**.684**	.203	.257	.248		.153	.146
Leadership_a	**.678**	.202	.313		.126	.231	.182
Leadership_d	**.636**	.222	.225		.119	.257	.177
Trust _a	**.630**	.304			.193		
Trust _f	**.626**	.144	.121	.139	.611		
Leadership_j	**.597**	.298		.157		.181	.272
Leadership_g	**.550**	.226	.250		.115	.148	.403

Table 11(Continued)

Item	Factor Loadings						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Assist_h	.185	**.853**	.115	.123	.122		
Assist_g	.175	**.853**	.127	.112	.116		
Assist_f	.172	**.822**	.183	.110	.116		
Assist_i	.133	**.772**		.168			
Assist_b	.144	**.765**		.138			
Assist_e	.113	**.765**	.143			.136	
Assist_a	.154	**.734**	.111	.149			.167
Assist_k	.226	**.725**					.328
Assist_m	.225	**.724**	.148	.198			.202
Assist_c	.177	**.711**		.222		.115	.112
Assist_j	.125	**.609**		.168			.356
Assist_d	.162	**.558**		.125			-.224
Account_j	.287		**.799**	.148		-.196	
Account_c	.102	.187	**.775**				
Account_i	.157		**.751**				.105
Account _b	.120	.117	**.706**			.140	
Account _a			**.607**			.179	
Account _g	.105		**.533**	.168	.208	.189	
Account _h	.248	.231	**.496**			.376	.152
Account _k	.260	.313	**.448**			.217	
Leadership_f	.371	.146	**.376**	.217	.306	.337	.251
Feedback_c	.221	.281	.112	**.783**	.173		
Feedback_b	.179	.153	.120	**.730**	.140		
Feedback_e	.162	.531		**.639**		.120	
Feedback_f	.184	.480	.130	**.631**		.202	
Feedback_g	.153	.551	.153	**.596**		.172	
Feedback_d	.116	.451	.174	**.539**			.199
Feedback_a	.291	.220		**.530**		-.104	.115
Trust_d	.561	.158	.164	.130	**.648**		
Trust_e	.614	.121	.112	.122	**.615**		
Trust_b	.219				**.427**		
Account_e	.300	.169	.233			**.551**	
Account_f	.379	.413	.314			**.456**	
Assist_l	.201	.490	.101	.213			**.498**

Six factors represent the dimensions of "teacher trust principal and instructional leadership" (Trust and Leadership), "principal assist teacher" (Assist), "teacher account to principal" (Account), "principal feedback to teacher" (Feedback), "principal observation" (Trust) and "teacher account to principal for instruction" (Account). As seen in

Table 11, only one item (Assist _l) loaded in the seventh factor with a moderate loading, this particular item also loaded on factor 2.There is only one item loaded at seventh factor because of this reason this factor was not named.

4.1.1.5 Summary of EFA results of Teacher Perceptions about Themselves and Others (TPTO) Part of MIST Teacher Survey

As it is seen in the sections above, there are similarities and differences in the factor analysis results across Turkish and American samples.

The self-efficacy produced similar factor structure across the two samples. As it is seen in Tables 4 and 6, two dimensions were defined for the self-efficacy measures. These are efficacy of classroom management and efficacy of students support strategies. Similarly, use of tools, teacher-teacher feedback and collaboration for instruction dimension was identified as the same across the samples. Thus, since self-efficacy is the dependent variable of the study, similar structure obtained across the cultures will make the comparisons of the means in the subscale level possible across the two samples.

As was seen in the factor analysis, there were differences across the samples in some of the dimensions.

"Teacher-teacher respect" and "de-privatization" were defined as two orthogonal factors in the Turkish sample. On the other hand, these two dimensions were correlated in the American sample. Similarly, collective efficacy items were loaded as negative and positive collective efficacy with different items across the Turkish and American samples. However, majority of the items defined under this sub-dimension were loaded on the same factors across the samples. Collaboration

(collaboration for student development, collaboration for instruction and collaboration for classroom management) is another sub-dimension, which functioned differently across the samples. In the Turkish sample, it was possible to define two different subscales with different items as collaboration for student development, collaboration for instruction. However, in the American sample, collaboration dimension was defined 3 sub-scales with different items as collaboration for instruction and collaboration for student development and collaboration for classroom management.

As a result, even though the comparison of cultures on self-efficacy measures is possible because of the similar factor structures obtained for this sub-dimension, because of the differences in the factor structure for the other dimensions. The regression analysis will be carried out for the Turkish and American samples separately.

4.1.1.6 Summary of EFA results of Teacher Perceptions about School Administration of MIST Teacher Survey

As it is seen in the sections above, there are similarities and differences in the factor analysis results of the Turkish and American samples.

The teacher perceptions about school administration part of MIST Teacher Survey produced the similar factor structure across the two samples. As it seen from the tables 8 and 10, "principal assist teacher" and "principal feedback to teacher" were defined and these factors were similar across the two samples.

As was seen in factor analysis, there were differences across the samples in some of the dimensions. "Teacher trust to principal" and "instructional leadership" were defined as orthogonal factors in the Turkish sample. On the other hand, these dimensions were correlated in the American sample. "Teacher account to principal" was functioned differently across the cultures. In the Turkish sample, it was possible to define a subscale as "teacher account to principal for instruction". Similarly, some of the "teacher account to principal" items were loaded on a different factor and named as "teacher account to principal for instruction". Moreover, "teacher trust to principal" items were loaded as "teacher trust to principal" and "principal

observation" with different items across the Turkish and American samples. However, majority of items defined under this sub-dimension were loaded on the same factors across the samples. "Principal assist teacher" dimension was mainly similar but one item was loaded differently across the cultures.

In sum, as in the cases of the teacher perception about themselves and others in the teacher perception about school administration the regression analysis will be carried out for the Turkish and American samples separately.

4.1.2 Item Equivalence

Hulin stated "Differences in point biserial correlations between item responses and total scale scores between the different language versions of the scales are assumed to reflect psychometric differences introduced by the translation from the source to the target language." (1987, p.115). Appendix K indicates item score and test score correlation coefficients across Turkish and English versions of the scale. Figure 6 indicates distribution of item discrimination indexes (correlation coefficients) across two language versions of the scale as r_{tr} and r_{usa}. These correlations were transformed into z by Fisher's z transformation. The significant tests flagged three items with significantly different discrimination indexes.

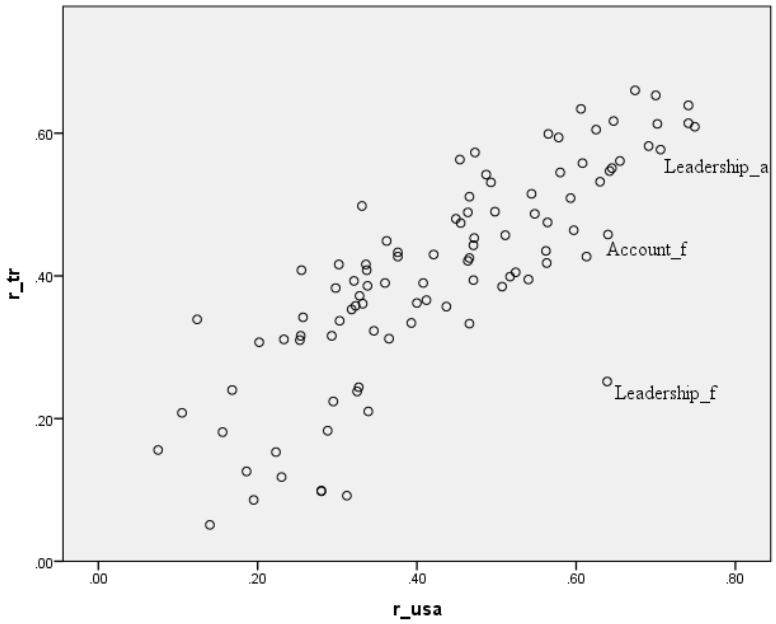


Figure 6 Scatter Diagram of Discrimination Indexes of Items of TR and USA

As it is seen from the Figure 6, two items are in “instructional leadership” dimension and one item is in “teacher accountability to principal” dimension. (Detailed analysis table of the all items were given at Appendix K, TableK1, K2 and K3). When closely evaluated, these 3 items gave different discrimination indexes across the two versions. Table 12 indicates the item content and the result of the test statistics.

Table 12 Items with Different Discrimination Indexes

Item	**Item**	**Mean TR**	**Mean USA**	**r_{tr}**	**r_{usa}**	**z_{tr} (Fisher z for TR r)**	**z_{rusa} (Fisher z for USA r)**	**Z_d (z_tr-z_usa/ s_zr)**
Makes clear to the staff his or her expectations for meeting instructional goals in mathematics (Leadership_a)	Matematik öğretim hedeflerinin karşılanmasına yönelik beklentilerini net bir şekilde ifade eder.(Leadership_a)	3.718	3.967	.609	.749	0.707	0.970	-2.567**
Presses mathematics teachers to implement what they have learned in professional development (Leadership_f)	Matematik öğretmenlerinin hizmet içi eğitim (seminer) sırasında öğrendiklerini uygulamaları yönünde baskı yapar.(Leadership_f)	2.476	3.900	.252	.639	0.257	0.756	-4.859**
Use him/her/hem as a resource when instructional problems arise (Account_f)	Öğretimsel problemlerle karşılaştığımda kendisini kaynak olarak kullanmamı.(Account_f)	2.584	2.544	.458	.640	0.495	0.759	-2.574**
*p<.05. two tailed test z_{crit} = +-1.960 **p<.01. two tailed test z_{crit} = +-2.575								

According to Table 12, the first item, which functions differently across the cultures with respect to item discrimination index, is related with instructional leadership construct. This difference could be explained by the differences in educational practices across the countries. In Turkey, administrators are not responsible for instructional process and they are not responsible for instructional goals. This is a consequence of centralized education system in Turkey. On the other hand, in the USA the educational system is not centralized thus administrators are responsible for the instructional goals at their schools. They should clarify the instructional goals to teachers. The second item which functions differently across the cultures with respect to item discrimination index is related with also instructional leadership construct. In both cultures, teachers reported that they do not feel a pressure about applying the things they learned during the professional developments. In Turkey, teachers attend a few or none professional development during their professional life. However, American teachers attended professional development sections regularly, but they do not feel pressure about applying the things they learned during professional development in their schools. The reason of the differences in the discrimination parameters on this item could be explained by a translation problem. The word used for "pressure" in the Turkish language rather emphasizes a stronger action which may have the meaning of "forcing the teachers to implement what they have learned in professional development". When the frequencies of the responses across the alternatives are compared, it was observed that in the Turkish sample there was less agreement in the responses of the teachers on this item compared to the USA sample. The last item, which functions differently across the cultures with respect to item discrimination index, is related with the construct "teacher accountability to principal".

Table 13 indicates the summary of item statistics of the MIST scale. The mean of item test score correlations of Turkish mathematics teachers (M= 0.4031, SD= 0.14720) were smaller than the mean of item correlations of American sample. (M=0.4318, SD= 0.16506). Moreover, as seen in Table 13, item means of Turkish mathematics teachers (M=3.322, SD=1.84) were slightly smaller than item means of American mathematics teachers (M=3.412, SD=1.63). These statistics point out no major differences across the samples in the item level statistics.

Table 13 Summary of Item Statistics for MIST Teacher Survey

	TR					USA				
	Item Means	Item Variances	Inter-Item Covariances	Inter-Item Correlations	Means of Fisher's z	Item Means	Item Variances	Inter-Item Covariances	Inter-Item Correlations	Means of Fisher's z
Mean	3.322	.917	.155	.172	.4396	3.412	1.038	.194	.196	.4819
Minimum	.253	.158	-.200	-.176	.05	.371	.088	-.456	-.284	.08
Maximum	7.902	2.970	1.585	.866	.79	7.585	3.232	1.703	.960	.97
Range	7.650	2.812	1.785	1.042	.74	7.214	3.144	2.159	1.244	.90
Maximum / Minimum	31.258	18.782	-7.913	-4.928	15.8	20.428	36.564	-3.738	-3.380	12.125
Variance	3.401	.238	.024	.023	.032	2.685	.300	.042	.030	.046
N of Items	98	98	98	98	98	98	98	98	98	98

Figure 7 below indicates the scatter diagram of the item means across the two cultures. The correlation coefficient between the item means across the cultures is same across the cultures.

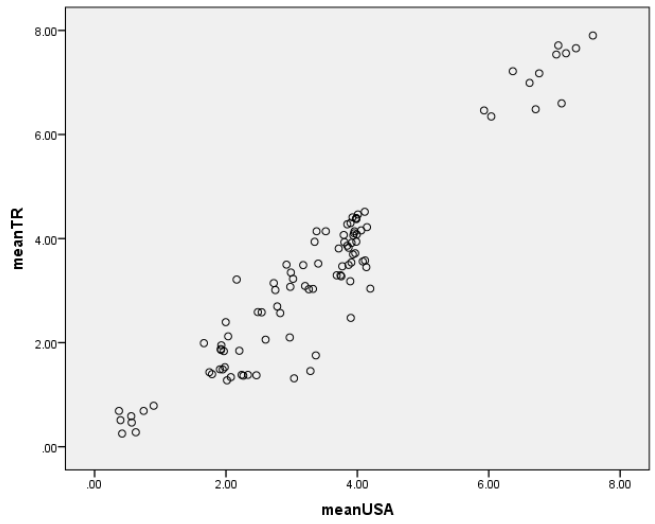


Figure 7 Scatter Diagram of Item Means

Figure 7 shows that item means are closely same across the cultures. Distribution of item means is linear but grouped at different regions of the graph. The reason of this grouping is that, sub-scales of the items have different number of option in the Likert scales format. For example, self-efficacy items have 9-point response categories; collaboration items have 2-point response categories.

In summary, the item level analyses with respect to item test score correlations, item means and factor analysis indicated that Turkish version and English version of the MIST teacher survey were not completely equivalent. There are dimensions which provided similar structure with the same questionnaire items across Turkish and English versions of the scale, such as efficacy of classroom management strategies, efficacy of student support strategies, use of tools, collaboration for instruction, principal assist to teacher and principal feedback. On the other hand, the dimensions of teacher-teacher respect, de-privatization, positive collective efficacy, negative collective efficacy, collaboration for student development, collaboration for classroom, teacher trust principal, instructional leadership, teacher account to principal, principal observation, and teacher account to principal for instruction, have

different structures across the forms. This study aims to compare the efficacy measures of the mathematics teachers. As explained above, this particular sub-dimension functions similarly across the cultures. However, mean a comparison in the efficacy measures requires scalar equivalence. Thus, in the following section, the results of the measurement invariance for the self-efficacy scale are presented.

4.2. Measurement Invariance for Self-Efficacy Scale Scores across Turkey and USA

Measurement invariance was conducted to get evidence of comparability of Turkish and English versions of self-efficacy sub-scale of MIST teacher survey. In the measurement invariance, the two dimensions of the self-efficacy measures such as efficacy of classroom management strategies and efficacy of student support strategies were considered in the analysis.

Meredith (1993) defined the measurement invariance, as a person's probability of an observed score does not depend on his group membership. Multi-group confirmatory factor analysis is used to test whether the parameters characterizing a scale's factor structure are invariant or similar across cultures (Cheung & Rensvold, 2002; Oliveri et al., 2012). Measurement invariance testing was conducted by comparing the fit of a series of increasing restrictive nested models to determine the extent to which model parameters were similar across cultures. There are four levels of measurement invariance to compare the scale scores across the cultures, such as, i) configural invariance, ii) weak invariance, iii) strong invariance and iv) strict invariance (Meredith, 1993 as cited in Wu, Li, & Zumbo, 2007). Wu, Li & Zumba defined these factorial tests as "Configural invariance requires that the same factor model specification holds across groups. In addition to configural invariance's equality constraints, weak invariance requires the cross-group equality in the factor loadings, strong invariance requires the cross-group equality in the loadings and intercepts, and strict invariance requires the cross-group equality in the loadings, intercepts, and residual variances." (Wu, Li & Zumbo, 2007, page 4).

Multi group (MG) confirmatory factor analysis (CFA) is the most common way to investigate factorial invariance (Jöreskog & Sörbom, 1993). The decision rule for measurement invariance relies upon whether the added constraints make a significant

improvement to the model fit (Wu, Li & Zumbo, 2007, page 5). Model fit was evaluated in terms of several fit statistics, such as chi square statistics, goodness-of-fit index (GFI), root mean square error of approximation (RMSEA; Browne & Cudeck, 1993) comparative fit index (CFI; Hu and Bentler, 1999), normal fit index (NFI; Bentler and Hu, 1999), and non-normal fit index (NNFI; Bentler and Hu, 1999). RMSEA values less than .06 were used to indicate good model fit and those less than .08 suggested reasonable fit (Hu & Bentler, 1999). The CFI values above .95 were used to indicate adequate fit (Hu & Bentler, 1999). The chi-square difference statistic of the nested models ($\chi^2_{Difference}$) is known to reject the null hypothesis of equivalent model parameters in measurement invariance testing based on trivial differences in large sample sizes. The incremental changes of the CFI ($\Delta CFI \leq 0.001$) were also used in the tests of measurement invariance (Cheung & Rensvold, 2002; Wu, Li & Zumbo, 2007) Wu, Li & Zumbo (2007) suggested, chi square does not provide practical usefulness in testing configural invariance. Table 14 indicates all the fit indexes obtained for the four levels of invariance in the present study.

Table 12 Measurement Invariance Models across Turkey and USA

Index	**GFI**	**RMSEA**	**CFI**	**NFI**	**NNFI**	**Chi-Square**	**Contribution to Chi-Square**	$\Delta \chi^2$	**ΔCFI (≤0.001)**
Criteria	**>0.9**	**<0.08**	**>0.95**	**≥.95**	**≥.95**				
Configural Model	0.942	0.060	0.987	0.973	0.985	223.26	7.22	---	---
Weak Invariance	0.942	0.055	0.988	0.972	0.988	226.06	7.22	2.8	0.001
Strong Invariance	0.870	0.087	0.962	0.944	0.967	456.65	7.43	233.3	-0.025
Strict Invariance	0.870	0.087	0.962	0.944	0.967	456.34	7.43	233.0	-0.025

First level of the factorial test is configural invariance that requires that the same factor model specification holds across groups. To test whether the conceptual frameworks of the efficacy of student support strategies and efficacy of the classroom management strategies are same across the cultures or not, configural invariance was investigated. RMSEA, GFI, CFI NFI and NNFI values were greater than the criterion values of each index. χ^2 was 223.26 (df =118, p< 0.001). Therefore, configural invariance was satisfied. The same constructs of the efficacy of student support strategies and efficacy of classroom management strategies were measured across the cultures. Further levels of the factorial test could be analyzed.

Second level of the factorial test is weak invariance that requires the cross-group equality in the factor loadings. To test whether the factor loadings of efficacy of student support strategies and efficacy of classroom management strategies were equal across cultures or not, weak invariance was studied. RMSEA, GFI, CFI, NFI, NNFI, values were greater than the criterion values of each index, and $\Delta\chi^2$ was 2.8 (Δdf= 12, p< 0.001) and ΔCFI (ΔCFI ($\leq$0.001)) value was satisfied the criterion value Thus, weak invariance was satisfied. Factor loadings of the efficacy of student support strategies and efficacy of the classroom management strategies were equal.

Third level of the factorial test is strong invariance that requires the cross-group equality in the factor loadings and intercepts. To test whether the intercepts of efficacy of student support strategies and efficacy of classroom management strategies were equal across cultures or not, strong invariance was investigated. CFI and NNFI values were exceeded the criterion values, but GFI, RMSEA and NFI values were not exceeded the criterion values. GFI, RMSEA and NFI values were at the cut-off point. On the other hand, and ΔCFI (ΔCFI ($\leq$0.001) value was smaller than the criterion value. Therefore, mainly based on the CFI and NNFI index values, strong invariance was satisfied. Intercepts of the efficacy of student support strategies and the efficacy of the classroom management strategies were equal.

Last level of the factorial test is strict invariance that requires the cross-group equality in the factor loadings, intercepts, and residual variances. To test whether the regression residual variances for all items were equal across cultures or not, strict

invariance was investigated. The NNFI and CFI values were satisfied. These two index values were greater than the criterion values. GFI value was lower than the criterion value but the value of GFI was so close the criterion value. Similarly, RMSEA and NNFI values were at the border. ΔCFI (ΔCFI (≤0.001) value was smaller than the criterion value which was satisfied the criterion value.

Based on ΔCFI it can be claimed that there is evidence for measurement invariance across the cultures for the self-efficacy measures. Based on this evidence the comparisons on the group means of the constructs of the efficacy can be carried out across the cultures.

4.3 Differences in the Self-Efficacy Measures across Turkish and USA Teachers

In order to test the mean differences in the sub-dimensions of the self-efficacy measures across Turkey and USA one-way multivariate analysis of variance was used. A one-way multivariate analysis of variance (MANOVA) was conducted to determine the mean differences in the middle school mathematics teachers' self-efficacy in the dimensions of classroom management strategies and student support strategies across Turkish and American samples.

As was explained in the factor analysis section, two dimensions were identified in the self-efficacy measures of the MIST scale as similar across the cultures. These dimensions were also tested in terms of measurement invariance in section 4.2. In the first dimension, which was named as efficacy of student support strategies, there are 8 items loaded on a separate factor in the two samples. Similar to the efficacy of student support dimension, there were 4 items loaded on a separate factor which is efficacy of classroom management strategies in the two samples. Thus, two subscale scores were computed for each dimension across the samples. The item scores were added up and divided by the number of items in the respective sub-dimension in calculating the subscale scores. The Cronbach's alpha reliabilities of these dimensions were found as 0.831, 0.844 in the Turkish sample and 0.903, 0.882 in the USA sample for the classroom management and student support dimensions, respectively.

Table 13 indicates the means and the standard deviations of the Turkish and American samples in the sub-dimensions of classroom management strategies and student support strategies

Table 13 Descriptive Statistics of Dependent Variables

	Country	Mean	Std. Deviation	N
ClassMan	Turkey	7.4830	1.01211	379
	USA	7.0751	1.28278	245
	Total	7.3228	1.14270	624
SSupport	Turkey	6.9647	.97698	379
	USA	6.6777	1.09544	245
	Total	6.8520	1.03382	624

As it is seen, in Table 13, in both sub-dimensions the smaller sample which is the USA sample used in this study has greater variances. In comparing group means, this inequality creates problem in Type I error rate. In general, the effect of this inequality is a liberal statistical test result (Stevens, 2002). On the other hand, MANOVA also requires independence of observations, multivariate normality on the dependent variable, equality of variance & covariance matrices across the samples to be compared. This last assumption is hardly achieved in any data set (Stevens, 2002; Tabachnick & Fidell, 2007; Pallant, 2007).

In the present data set, it is likely that these assumptions were not met completely. The major effect of violating these assumptions is on the Type I error and the power of the statistical tests. Thus, as suggested by Stevens (2002), the hypotheses in this particular analysis were tested at a smaller alpha level. In the present study, hypothesis testing with group comparisons were tested at alpha 0.025 and alpha 0.001 level of significance. It is expected that using smaller alpha levels might control the effect coming from the violation of assumptions in MANOVA

Table 14 Tests of Between-Subjects Effects

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	ClassMan	24.765[a]	1	24.765	19.530	.000	.030
	SSupport	12.256[b]	1	12.256	11.664	.001	.018
Intercept	ClassMan	31537.523	1	31537.523	24871.096	.000	.976
	SSupport	27695.022	1	27695.022	26356.207	.000	.977
Country	ClassMan	24.765	1	24.765	19.530	.000	.030
	SSupport	12.256	1	12.256	11.664	.001	.018
Error	ClassMan	788.720	622	1.268			
	SSupport	653.596	622	1.051			
Total	ClassMan	34274.773	624				
	SSupport	29962.683	624				
Corrected Total	ClassMan	813.485	623				
	SSupport	665.852	623				
a. R Squared = .030 (Adjusted R Squared = .029)							
b. R Squared = .018 (Adjusted R Squared = .017)							

The overall multivariate test is significant at both alpha levels. MANOVA produced a significant multivariate test results across the samples. The Wilks's Lambda is significant in this analysis. As it is seen in Table 14, the significant differences are also observed in the sub-dimensions of self-efficacy measures at both alpha levels. The mean differences have effect size values which are between small and medium. In both sub-dimensions, the Turkish mathematics teachers have greater means in self-efficacy. In conclusion, there is significant mean difference in the sub-dimensions of the self-efficacy (efficacy of student support strategies and efficacy of classroom management strategies) measures across the countries. In the next section, the results of bivariate regression analyses are presented.

4.4 The Relationship of Teacher and School Related Factors to Mathematics Teachers' Self-efficacy Across Turkey and USA

Two separate analyses in LISREL were carried out to study the relationships of independent variables with the sub-dimensions of the efficacy measures. Since the

dimensions were different in two cultures, in this particular analysis, regressions were carried out interpreted separately within each culture. Total four regression analyses were carried out in this part of the study. As was explained before, the first group of analyses deals with the sub dimensions in the teacher related factors. The second group of analyses deals with the school related factor. In the Turkish sample, the teacher related factors such as "teacher-teacher respect" (T_respect), "positive collective efficacy" (PositiveCE), "teacher-teacher feedback" (T_Feedback), "negative collective efficacy" (NegativeCE), "deprivatization" (Deprivati), "collaboration for student development" (CollaStudent), "use of tools" (Tools) and "collaboration for instruction" (CollaInst) were treated as the independent variables. In the USA sample, the teacher related factors such as "teacher teacher respect with deprivatization" (T_ResDepri), "positive collective efficacy" (PositiveCE), "collaboration for instruction" (CollaInst), "negative collective efficacy" (NegativeCE), "use of tools" (Tools), "teacher-teacher feedback" (T_Feedback), and collaboration for management (CollaStudent) were used as the independent variables. On the other hand in school related factors, dimensions of "teacher trust principal" (Trust), "principal assist teacher" (Assist), "principal feedback teacher" (Feedback), "instructional leadership" (Leadership), "teacher account to principal" (Account), "principal observation" (Trust), "teacher account to principal for instruction" (Account) were used as independent variables in the Turkish sample, while "teacher trust principal and instructional leadership" (Trust) and (Leadership) , "principal assist teacher" (Assist), "principal feedback teacher" (Feedback), "teacher account to principal", "principal observation" (Trust),, "teacher account to principal for instruction" (Account) dimensions were used as independent variables in the USA sample.

4.4.1. Outlier Analysis

In the regression analysis, outliers may be important and influence the results seriously. In the present study, outlier and influential point analysis were carried before running the regression analyses. In the related literature, there are various indexes proposed for flagging outliers and influential data points. The outlier analyses deals with whether they have influence on the estimation of at least one constant in the regression equation. Cook's distance indicates the combined effect of

the outliers on both dependent variable and the independent variables (Stevens, 2002, p. 126). Any value of 1 and greater than 1 is flagged as the influential data point. As it is seen in Table 15, there seems no influential data point in the samples used for regression analysis. Thus, the regression analyses were carried out without any data deletion.

Table 15 Cook's Distances

			Minimum	Maximum	Mean	S.D.	Sample
TPTO	SSupport	Turkey	.000	.035	.003	.005	379
	ClassMan	Turkey	.000	.109	.003	.008	379
	SSupport	USA	.000	.120	.005	.012	245
	ClassMan	USA	.000	.047	.005	.008	245
TPSA	SSupport	Turkey	.000	.043	.003	.005	379
	ClassMan	Turkey	.000	.108	.003	.007	379
	SSupport	USA	.000	.161	.005	.013	245
	ClassMan	USA	.000	.077	.004	.008	245

Any value of 1 and greater than 1 is flagged as the influential data point. As it is seen in Any value of 1 and greater than 1 is flagged as the influential data point. As it is seen in Table 15, there seems no influential data point in the samples used for regression analysis. Thus, the regression analyses were carried out without any data deletion.

Table 15 there seems no influential data point in the samples used for regression analysis. Thus, the regression analyses were carried out without any data deletion.

4.4.2 Assumptions of Multiple Linear Regression

In multiple linear regression, multicollinearity is an important requirement. In the present study, multicollinearity was evaluated by the use of Tolerance and Variance Inflation factor (VIF) (Stevens, 2002). The VIF indexes which are below 10, is used as evidence of no dependency among the independent variables (Stevens, 2002; Tabachnick & Fidell, 2007; Pallant, 2007). The distributions of these indexes are presented in Table 16.

Table 16 VIF and Tolerance Values of Independent Variables

			Min	**Max**	**Range**	**Median**
USA	TPTO	Tolerance	.664	.929	.266	.766
		VIF	1.076	1.507	0.430	1.306
	TPSA	Tolerance	.382	.618	.236	.534
		VIF	1.618	2.620	1.001	1.874
Turkey	TPTO	Tolerance	0.563	0.962	0.339	0.737
		VIF	1.039	1.776	0.737	1.356
	TPSA	Tolerance	0.437	0.675	0.518	0.238
		VIF	1.481	2.286	1.932	0.805

As it is seen in Table 16, there is no multicollinearity problem.

Multiple linear regression also has some strong assumptions. As was stated in Stevens (2002), errors are independent and follow a normal distribution with constant variance (Stevens, 2002, page 110). For testing the assumptions of the multiple linear regression, the scatter diagram of the standardized residuals versus the predicted value of the dependent variable is visually evaluated. It is expected to have a random distribution of the points in the scatter diagram if the assumptions are tenable (Stevens, 2020, page 110). The normality of the distributions of residuals is also used as a support for meeting the assumptions of the regression analysis.

As it is evidenced by scatter diagrams presented in Table 17 and 18, there seems to be no violation of the assumptions of the regression analysis.

Table 17 Normal P-P Plot of Regression Standardized Residual of Turkey

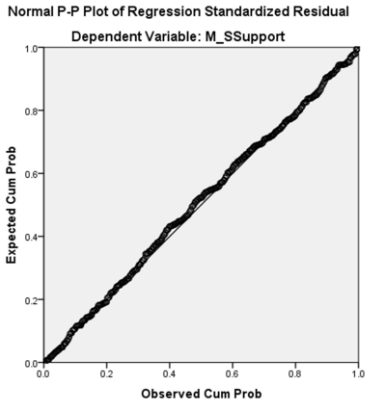
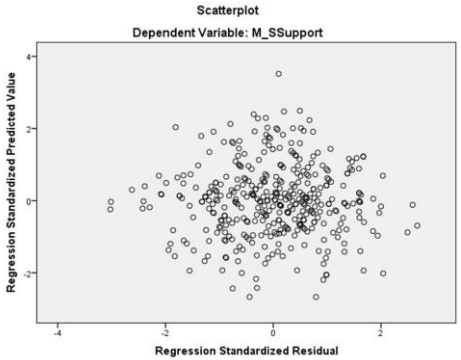
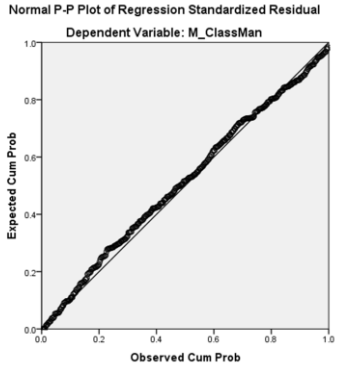
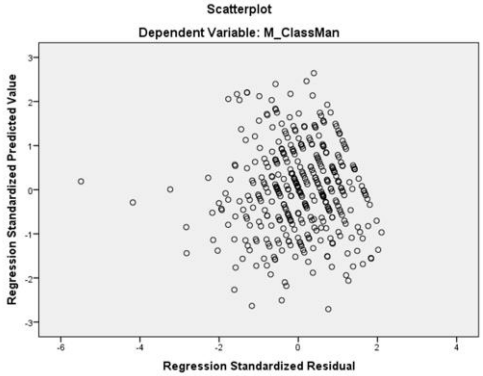
Turkey		**Normal P-P Plot of Regression Standardized Residual**	**Scatterplot of the Standardised Residuals**
TPTO	SSupport		
	ClassMan		

Table 17 (Continued)

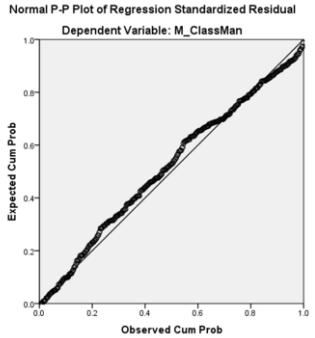
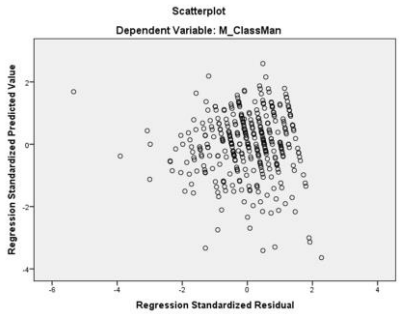
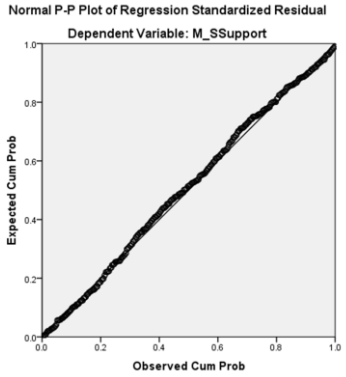
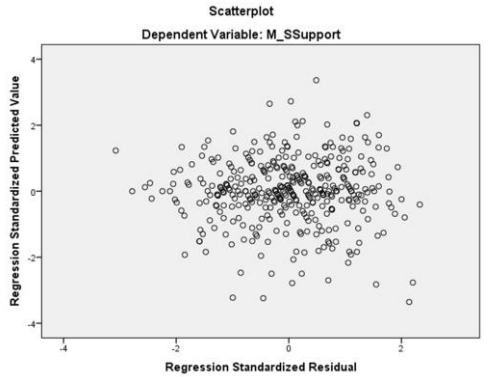
Turkey		Normal P-P Plot of Regression Standardized Residual	Scatterplot of the Standardised Residuals
TPSA	ClassMan		
	SSupport		

Table 18 Normal P-P Plot of Regression Standardized Residual of USA

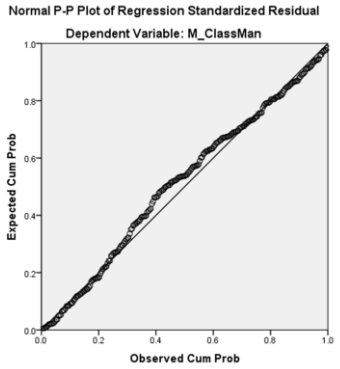
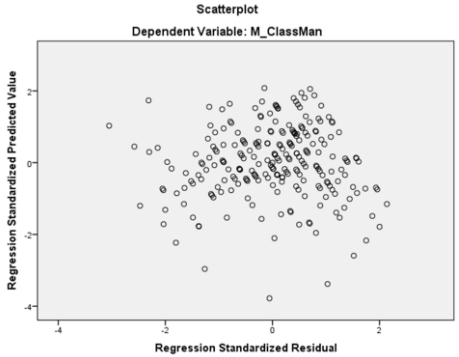
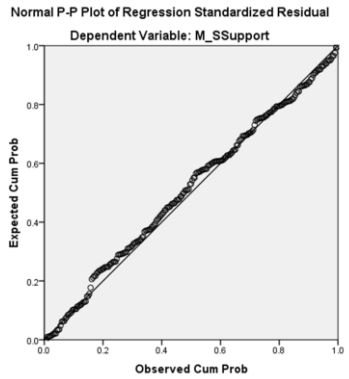
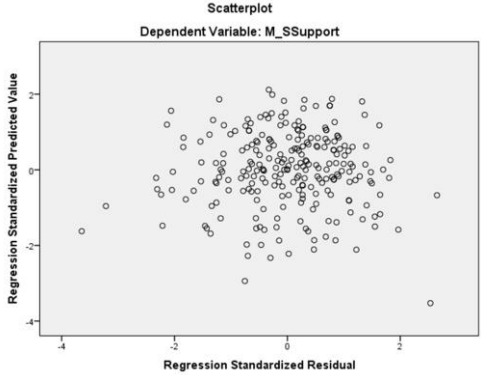
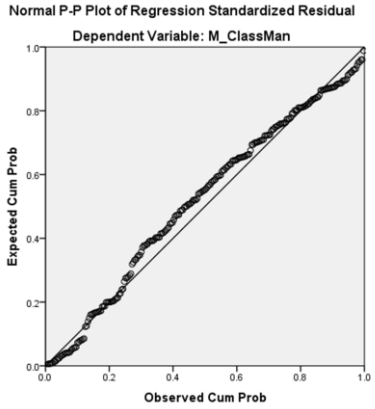
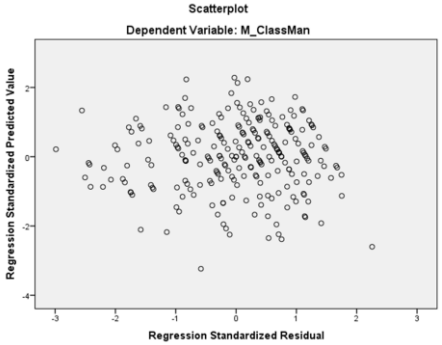
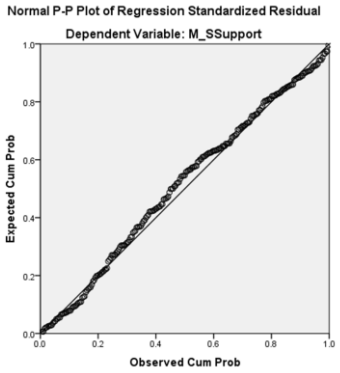
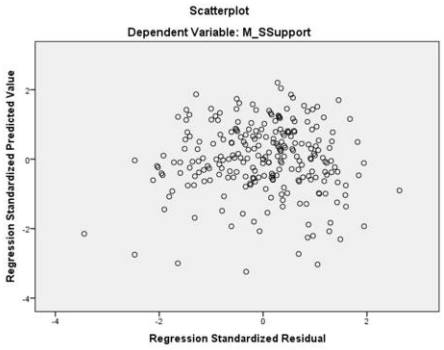
USA		Normal P-P Plot of Regression Standardized Residual	Scatterplot of the Standardised Residuals
TPTO	ClassMan		
	SSupport		

Table 18 (Continued)

USA		Normal P-P Plot of Regression Standardized Residual	Scatterplot of the Standardised Residuals
TPSA	ClassMan		
	SSupport		

As was explained before, the efficacy measures of the middle school mathematics teachers provided two orthogonal sub-dimensions. Thus, bivariate regression was used to analyze the variables that were related to the self-efficacy measures of the middle school mathematics teachers in both samples through LISREL package program (Jöreskog & Sörbom, 2003).

4.4.3 The Relationship between Teacher Related Factors and Self-efficacy in Turkey

Bivariate linear regression was conducted to evaluate how well the self-efficacy measures are predicted by teacher related factors. Estimates and standardized solution were given in Figure 8 and 9 respectively. Figure 10 presented in significance of the t values obtained for each relationship. The regression equations and the multiple R for this particular analysis are given in Equation 1 at Appendix M.

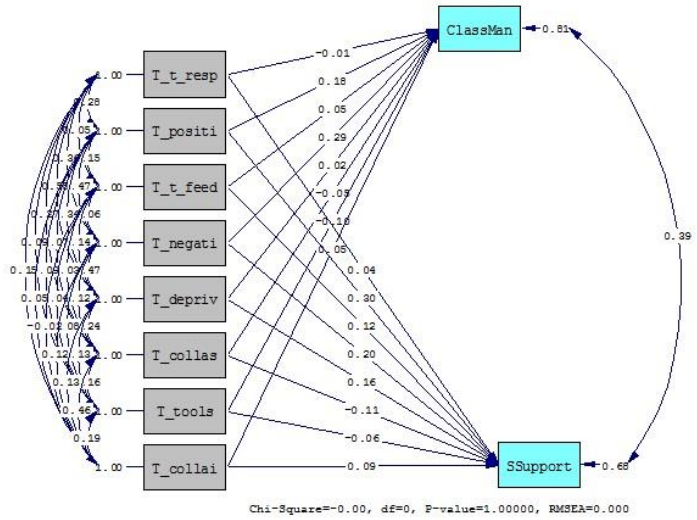


Figure 8 Estimates of TPTO of Turkish Teachers

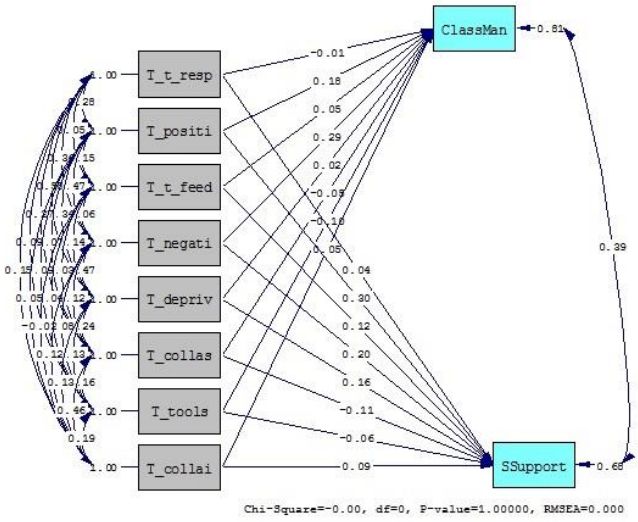


Figure 9 Standardised Solution of TPTO of Turkish Teachers

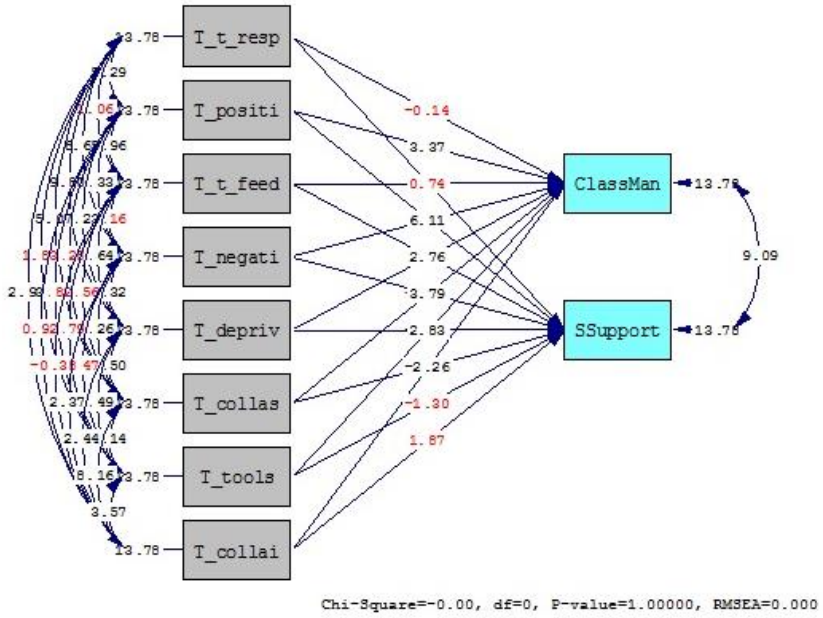


Figure 10 t values of TPTO of Turkish Teachers

In this particular analysis, “positive collective efficacy”, “teacher-teacher feedback”, “negative collective efficacy”, and “de-privatization” had a positive relationship with the student support strategies of Turkish middle school mathematics teachers. “Collaboration for student support” had a negative relationship with the student support strategies of Turkish middle school mathematics teachers. “Collaboration for

instructional strategies", "Teacher respect" and "use of tools" did not have a relationship with student support strategies of Turkish middle school mathematics teachers. "Positive collective efficacy" and "negative collective efficacy" had a positive relationship with the classroom management strategies of Turkish middle school mathematics teachers. "Use of tools" had a negative relationship with classroom management strategies of Turkish middle school mathematics teachers. "Teacher respect", "teacher-teacher feedback", "de-privatization", "collaboration for student support", "collaboration for instructional strategies", did not have a relationship with classroom management strategies of Turkish middle school mathematics teachers. The R square values are 32.3 % for efficacy of student support strategies and 18.6% for efficacy of classroom management, respectively.

4.4.3 The Relationship between Teacher Related Factors and Self-efficacy in the USA

Bivariate linear regression was conducted to evaluate how well the self-efficacy measures of USA middle school mathematics teachers are predicted by teacher related factors. Estimates and Standardized solution were given at Figure 11 and 12 respectively. Figure 13 presented the significance of the t values. The regression equations and the multiple R for this particular analysis are given in Equation 2 at Appendix N.

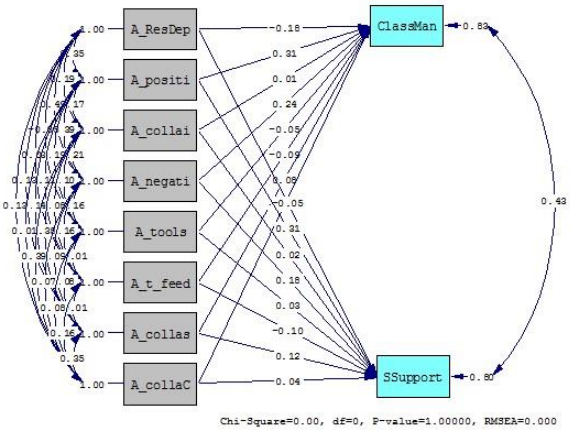


Figure 11 Estimates of TPTO for USA Teachers

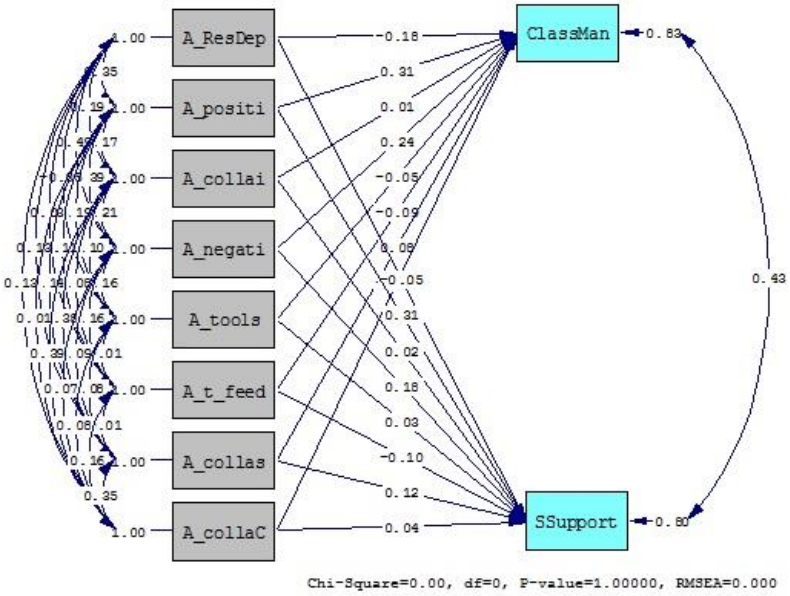


Figure 12 Standardised Solution of TPTO for USA Teachers

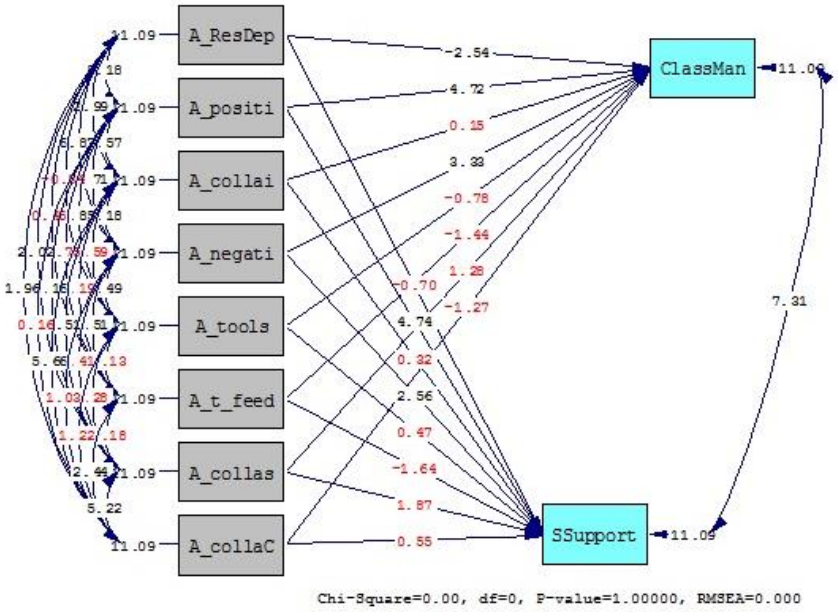


Figure 13 t values of TPTO for USA Teachers

In this particular analysis, “positive collective efficacy” and “negative collective efficacy” had a positive relationship with the student support strategies of American middle school mathematics teachers. “Teacher respect with de-privatization”,

“collaboration for student development” “collaboration for instruction”, collaboration for management, “use of tools” and “teacher feedback” did not have a relationship with student support strategies of American middle school mathematics teachers. “Positive collective efficacy” and “negative collective efficacy” had a positive relationship with the classroom management strategies of American middle school mathematics teachers. On the other hand, “teacher respect with de-privatization” had a negative relationship with the classroom management strategies of American middle school mathematics teachers. “Collaboration for student development” “collaboration for instruction”, collaboration for management, “use of tools” and “teacher feedback” did not have a relationship with the classroom management strategies of American middle school mathematics teachers. The R square values are 19.6 % for efficacy of student support strategies and 17.2 % efficacy of classroom management, respectively.

4.4.4 Summary of Relationship between Teacher Related Factors and Self-efficacy Across Countries

Table 19 summarizes the significant predictors, p-values, β_i and R^2 values for the regression analyses.

Table 19 Summary of Relationship between Teacher Related Factors and Self-efficacy Across Countries

Country	Dependent Variable	Predictor	p-value	β_i	R^2
TR	ClassMan	Positive collective efficacy	0.001	0.181	0.186
		Negative collective efficacy	0.000	2.94	
		Use of tools	0.036	-0.101	
	SSupport	Positive collective efficacy	0.000	0.300	0.323
		Teacher Feedback	0.006	0.119	
		Negative collective efficacy	0.000	0.198	
		Deprivatization	0.005	0.159	
		Collaboration for student Development	0.026	-0.111	
USA	ClassMan	Respect & Deprivatization	0.013	-0.178	0.171
		Positive collective efficacy	0.000	0.1312	
		Negative collective efficacy	0.001	0.237	
	SSupport	Positive collective efficacy	0.000	0.309	0.196
		Negative collective efficacy	0.012	0.179	

4.4.5 The Relationship between School Related Factors and Self-efficacy in the Turkey

Bivariate linear regression was conducted to evaluate how well the self-efficacy measures of Turkish middle school mathematics teachers are predicted by school related factors. Estimates and Standardized solution were given at Figure 14 and 15 respectively. Figure 16 presented the significance of the t values. The regression equations and the multiple R for this particular analysis are given in Equation 3 at Appendix O.

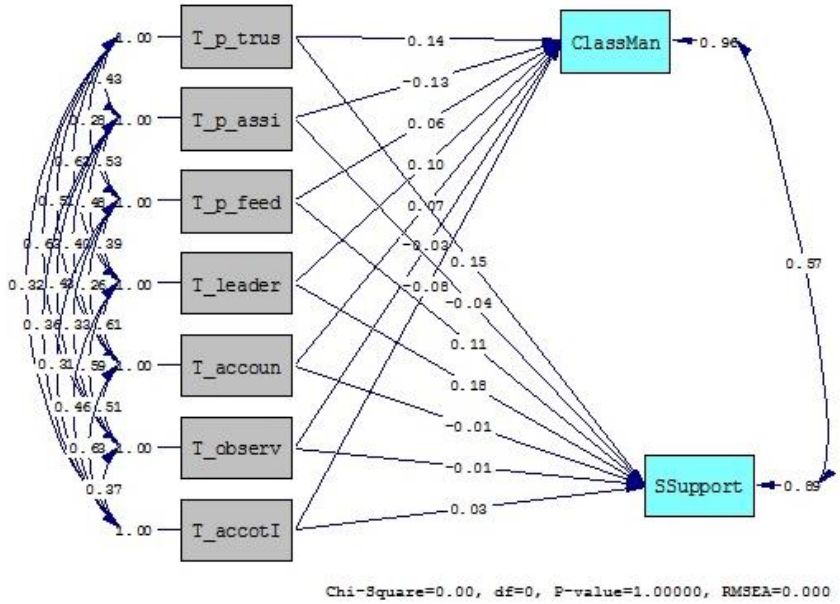


Figure 14 Estimates of TPSA for Turkey

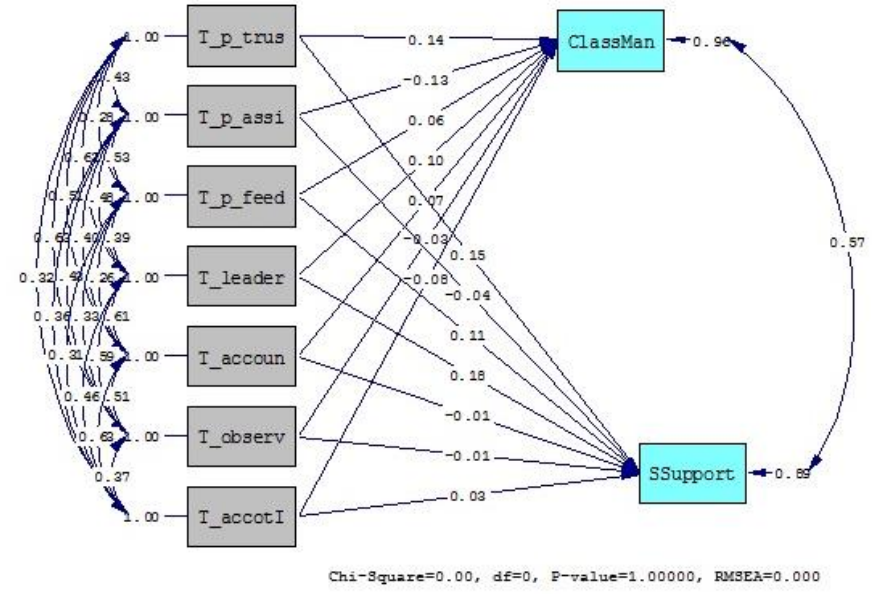


Figure 15 Standardised Solution of TPSA for Turkey

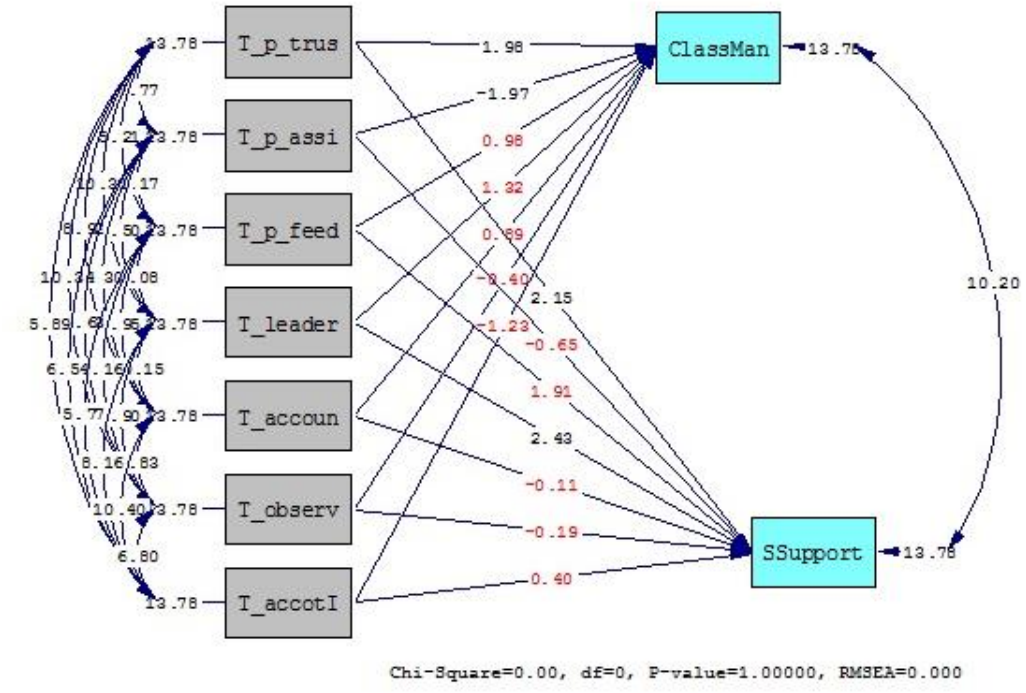


Figure 16 t values of TPSA for Turkey

In this particular analysis, “Teacher trust principal” and “instructional leadership” had a positive relationship with the student support strategies of Turkish middle school mathematics teachers. “Principal assist teacher”, “principal feedback teacher”, “teacher account to principal”, “principal observation”, and “teacher account to principal for instruction” did not have a significant relationship with student support strategies of Turkish middle school mathematics teachers. None of the school related factors has a relationship with the classroom management strategies of Turkish middle school mathematics teachers. The R square values are 10.4% for efficacy of student support and instructional strategies.

4.4.6 The Relationship between School Related Factors and Self-efficacy in USA

Bivariate linear regression was conducted to evaluate how well the self-efficacy measures of American middle school mathematics teachers are predicted by school related factors. Estimates and Standardized Solution were presented at Figure 17 and 18 respectively. Figure 19 presented the significance of the t values. The regression equations and multiple R for this particular analysis are given in Equation 4 at Appendix P.

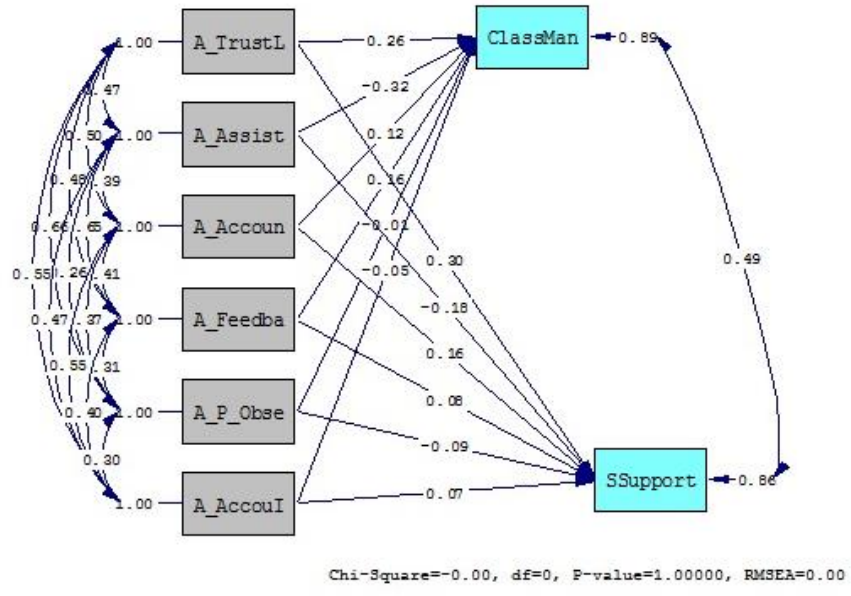


Figure 17 Estimates of TPSA for USA

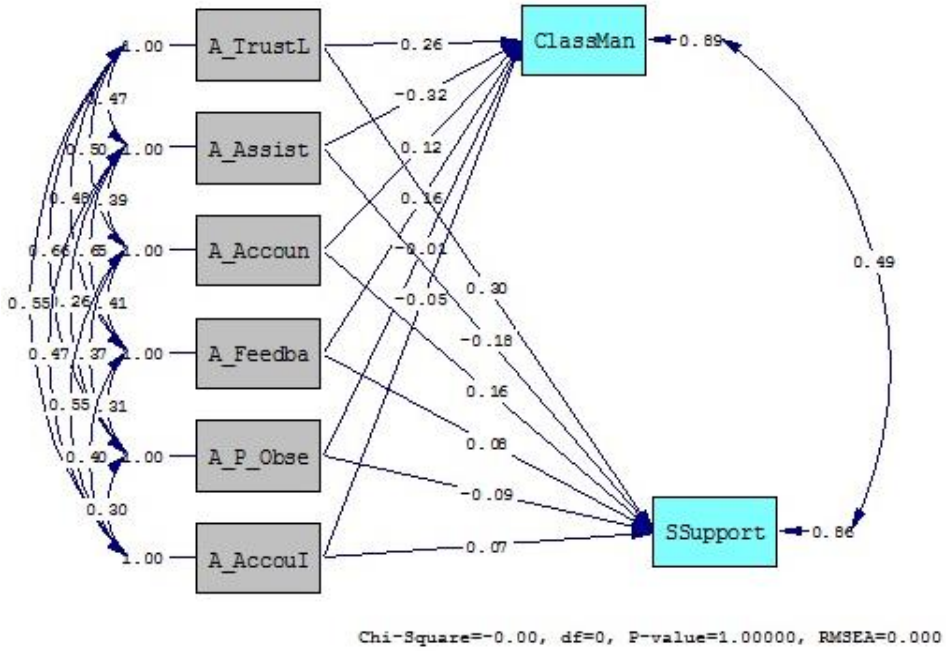


Figure 18 Standardised Solution of TPSA for USA

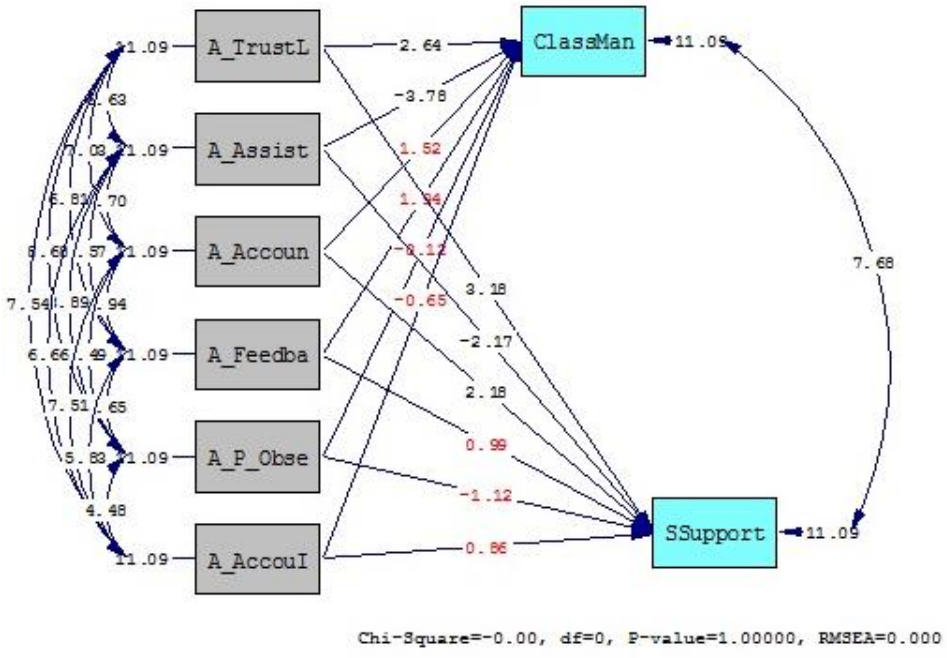


Figure 19 t values of TPSA for USA

In this particular analysis, “teacher trust principal and instructional leadership”, “teacher account to principal” had a positive relationship with the student support strategies of American middle school mathematics teachers. “Principal assist teacher” had a negative relationship with the student support strategies of American middle school mathematics teachers. “Principal observation”, “teacher account to principal for instruction” did not have a relationship with student support strategies of American middle school mathematics teachers. “Teacher trust principal and instructional leadership” had a positive relationship with the classroom management strategies of American middle school mathematics teachers. “Principal assist teacher” had a negative relationship with the classroom management strategies of American middle school mathematics teachers. “Principal feedback teacher”, “teacher account to principal”, “principal observation”, “teacher account to principal for instruction” did not have a relationship with classroom management strategies of American middle school mathematics teachers. The R square values are 14.3 % for efficacy of student support and instructional strategies and 10.7% for efficacy of classroom management strategies, respectively.

4.4.7 Summary of Relationship between School Related Factors to Self-efficacy Across Countries

Table 20 summarizes the significant predictors, p-values, intercept values and R^2 values for the second groups of regression analyses.

Table 20 Summary of Relationship between School Related Factors and Self-efficacy Across Countries

Country	Dependent Variable	Predictor	p-value	β_i	R^2
TR	ClassMan	-----	-----	-----	-----
	SSupport	Principal Trust	0.033	0.149	0.108
		Instructional Leadership	0.016	0.178	
USA	ClassMan	Teacher trust principal and instructional leadership	0.009	0.258	0.107
		Principal assist to teacher	0.000	-0.317	
	SSupport	Teacher trust principal and instructional leadership	0.002	0.304	0.143
		Principal assist to teacher	0.032	-0.179	
		Principal account to teacher	0,032	0.164	

4.4.8 Effect Size of the of Results of the Relationship between Teacher and School Related Factors to Self-efficacy Across Countries

Cohen (1988) defined effect size in the regression analysis as the square of the partial correlation coefficient. The values of small, medium and large effect sizes are defined as 0.02, 0.13, and 0.26 respectively. Square of partial correlation values of the significant constructs were estimated. Square of partial correlation values gives the effect sizes of the constructs. Table 21 gives the effect sizes of significant variables in the regression analyses. According to Table 21, only positive collective efficacy has medium effect size, rest of the variables have small effect size values.

Table 21 Effect Sizes of Variables

Country	Scale	Dependent Variable	Variables	Correlation	
				Partial Correlation	Square of Partial Correlation
TR	TPTO	Classman	Positive collective efficacy	.170	0.029
			Negative collective efficacy	.255	0.065
			Use of tools	-.108	0.012
		Ssupport	Positive collective efficacy	.299	0.090
			Teacher Feedback	.140	0.020
			Negative collective efficacy	.191	0.036
			Deprivatization	.144	0.021
			Collaboration for student development	-.115	0.013
	TPSA	Ssupport	Principal Trust	.110	0.012
			Instructional Leadership	.123	0.015
USA	TPTO	Classman	Respect & Deprivatization	-.160	0.025
			Positive collective efficacy	.288	0.083
			Negative collective efficacy	.208	0.043
		Ssupport	Positive collective efficacy	.289	0.084
			Negative collective efficacy	.161	0.026
	TPSA	Ssupport	Teacher trust principal and instructional leadership	.199	0.040
			Principal assist to teacher	-.137	0.019
			Principal account to teacher	.138	0.019
		Classman	Teacher trust principal and instructional leadership	.166	0.028
			Principal assist to teacher	-.234	0.055

4.5 Summary of the Results

The following results were obtained in the present study.

1. The self-efficacy dimensions are the same across the two cultures such as efficacy of classroom management strategies, efficacy of student support strategies.
2. In the teacher related factors, there are differences across the USA and Turkish samples. In Turkey, MIST scale items of the "teachers perceptions about themselves and others" were constituted "positive collective efficacy", "negative collective efficacy", "de-privatization", "collaboration for student support", and "teacher-teacher respect" orthogonal constructs. On the other hand, in the USA sample "teacher -teacher respect with de-privatization", "positive collective efficacy", "collaboration for student development" and "collaboration for instruction", "collaboration for classroom", "negative collective efficacy", "use of tools", "teacher-teacher feedback" were constituted as orthogonal constructs.
3. In the school related factors, there are differences across the USA and Turkish samples. In Turkey, MIST scale items of the "teachers' perceptions about school administration" were constituted "teacher trust principal", "principal assist teacher", "instructional leadership", "teacher account to principal", "principal observation", and "teacher account to principal for instruction" orthogonal constructs. On the other hand, in the USA sample "teacher trust principal and instructional leadership", "principal assist teacher", "teacher account to principal", "principal observation", "teacher account to principal for instruction" were constituted orthogonal constructs.
4. In the teacher related factors, in general "use of tools", and "teacher feedback" and "collaboration for instruction" are similar orthogonal factors across two cultures.
5. In school related factors, the dimensions of "principal feedback to teacher" and "principal assist teacher" are similar orthogonal factors across two cultures.

6. Turkish middle school mathematics teachers indicated higher efficacy levels than the teachers in the USA. The mean differences in this particular analysis provided small to medium effect size values.
7. In teacher related factors "positive collective efficacy", "teacher-teacher feedback", "negative collective efficacy", "de-privatization" dimensions indicated positive relationships and , "collaboration for student support" indicate a negative relationship with the efficacy of student support strategies of Turkish middle school mathematics teachers.
8. In teacher related factors, "positive collective efficacy" and "negative collective efficacy" have positive relationship with the efficacy of classroom management strategies of Turkish middle school mathematics teachers. On the other hand, use of tools has negative relationship with the efficacy of classroom management strategies of Turkish middle school mathematics teachers.
9. In teacher related factors, "positive collective efficacy" and "negative collective efficacy" have a positive relationship with the efficacy of student support strategies of American middle school mathematics teachers.
10. In teacher related factors, "positive collective efficacy" and "negative collective efficacy" have a positive relationship with the efficacy of classroom management strategies of American middle school mathematics teachers. On the other hand, "teacher-teacher respect with de-privatization" has a positive relationship with the efficacy of classroom management strategies of American middle school mathematics.
11. In school related factors, "teacher trust principal" and "instructional leadership" indicate a positive relationship with efficacy of student support strategies of Turkish mathematics teachers.
12. In school related factors, none of the constructs indicates a relationship with efficacy of classroom management strategies of Turkish mathematics teachers.
13. In school related factors, "teacher trust to principal with instructional leadership" has a positive relationship but "principal assist to teacher" has a

negative relationship with efficacy of student support strategies and efficacy of classroom management strategies of USA mathematics teachers.

14. In the school related factors, “principal account to teacher” have a positive relationship with the efficacy of student support strategies of USA mathematics teachers.
15. The amount of variance explained in the regression analysis provided small to medium effect size values. The contribution of each variable to the explanation of the variance on the self-efficacy measures provided small effect size values, except positive collective efficacy variable in the Turkish sample which could be considered as medium.

CHAPTER 5

DISCUSSION, CONCLUSIONS AND IMPLICATIONS

This section is devoted to the discussions of the results and suggestions for the further research.

5.1 Discussions of the Results

The purposes of this study are (1) to compare Turkish and American middle school mathematics teachers' self-efficacy (2) to compare teacher and school related factors and their relation to self-efficacy of the teachers in Turkey and USA.

In the related literature, there were very few studies comparing the middle school mathematics teachers' self-efficacy across Turkish and American middle schools and how self-efficacy explained by school and teacher related factors. The present study investigated equivalency of the MIST teacher scale used across the countries as a priori analysis. The cross-cultural comparisons require valid and reliable scales in two languages. Thus, in the present study, since it is aimed to compare two cultures in English and Turkish languages, equality of the instrument becomes a crucial issue. The equivalency requires construct and item equivalence to prove that scale functions similarly across countries (van de Vijver, Tanzer, 2004). In this respect item level data were studied for item and construct equivalencies. In the self-efficacy measure, two dimensions were similarly extracted in the factor analysis across the two samples. Moreover, there is evidence of scale invariance across the two cultures

based on the multi-group confirmatory analysis. Thus, the means of the middle school mathematics teachers' self-efficacy measures were compared across the samples. On the other hand, in terms of teacher and school related factors there were differences in the dimensionality of the scale across the cultures. Even though most of the dimensions were named similarly for the Turkish and English versions of the scale, the items constituted the dimensions were not the same. Thus, bivariate linear regression was conducted separately for the two samples to evaluate how well the self-efficacy measures are predicted by teacher and school related factors.

5.1.1Self Efficacy

Self-efficacy of teachers revealed the dimensions of efficacy of student support strategies and efficacy of classroom management strategies in both cultures. It means that, in terms of efficacy measures both Turkish and American teachers have similar perceptions about their confidence in dealing with teaching mathematics' and classroom management skills. This finding is supported by a study conducted for the self-efficacy of the mathematics teachers across Turkey and the USA. Çakıroğlu (2008) reported similar efficacy beliefs of the two cultures when pre-service mathematics teachers were concerned. When the items of the scale in this particular construct are analyzed closely the dimension of confidence in teaching mathematics basically deals with motivation of students, teachers' support for students learning and valuing mathematics as well as the effective use of assessment techniques and flexible teaching methods to help students to learn, and communicating with parents to foster learning. In general, teachers' actions about each of these attempts are rated on a frequency scale in this dimension. On the other hand, the dimension of classroom management skills basically deals with controlling disruptive behavior in classroom, calm down a noisy student, get students' to follow classroom rules, and establish classroom management system. Thus, when teachers' efficacy beliefs are concerned in the mathematics subject matter, confidence in teaching and classroom management skills are the two important areas to improve during pre-service education level. The literature especially emphasizes the importance of classroom management skills in improving students learning. In the international studies such as TIMSS and PISA it is clearly seen that teachers' ability to manage the classroom climate has a positive improvement in the mathematical literacy skills and

mathematics achievement of the students (OECD, 2013, Berberoğlu, 2015; Berberoğlu, 2014). The disciplinary climate index of the PISA is similar to efficacy of classroom management strategies. PISA defines the disciplinary climate index from students' reports on how often the following situation happens in the classroom such: i) students don't listen to what the teacher says; ii) there is noise and disorder; iii) the teacher has to wait a long time for the students to "quieten down"; iv) students cannot work well; and v) students don't start working for a long time after the lesson begins. This index's higher values indicate a better disciplinary climate. For instance in PISA 2012, the mean of disciplinary climate index for mathematics literacy skills is -0.009 which is below the OECD average. It is also known that the Turkish pre-service science teachers have low classroom management skills in mathematics in Turkey (Gencer & Cakıroglu, 2007).

The first dimension of the self-efficacy is supporting students learning in mathematics classes. As was stated above, this dimension in general deals with how often teachers support students learning in mathematics classes and deal with learning difficulties, use of assessment techniques properly and the communicating with students' parents. As in the cases of classroom management in TIMSS 2012, for those students whose teachers more emphasize and value success in the classroom, achievement in science and mathematics scores are increased (Mullis et al. 2012). It seems that teachers who are more oriented toward students improvement in terms of success, interest and motivation may foster academic success in their classroom. As in the cases of classroom management skills, this dimension also proves the importance of pedagogical development of teachers in dealing with students' interest, motivation and academic success.

In the present study, the dimensions of teachers' self-efficacy measures were compared across the countries. There are significant mean differences in both dimensions. The mean difference in students support dimension is in favor of Turkish mathematics teachers. However, that difference has small effect size values which means that it has no practical value. In general, the means of two samples are around 6 on a 9-point scale. This finding is rather contradictory with respect to the findings reported by Cakiroglu, Cakiroglu, and Boone (2005). They reported that pre-service elementary teachers in the USA had significantly more positive beliefs in

their ability to influence student learning in science than their peers in Turkey. It seems that teacher support is slightly greater in the Turkish sample compared to the USA sample. Having slightly higher mean in the Turkish sample might be coming from the ongoing emphasize on students learning in mathematics, since being successful in mathematics classes is a socially approved behavior. Individual differences could be emphasized in the pedagogy courses, in the private tutoring institutions and within the family as well. Even it is emphasized in almost every environment; it cannot have any practical implication on students' achievement as evidenced by the low students' performance in the TIMSS and PISA studies. The educational system is highly competitive in Turkey because of the high stake examinations at the end of 8^{th} grade level. Students learning speed is important because of the national selection examinations are usually administered as speeded tests. Thus, students learning pace if it is slower than the peer group could be a handicap in the classroom. Thus, helping students in this respect seems taking care of all the individual development in the mathematics classroom. This is rather a perception among the mathematics teachers that they should perform every effort possible listed in this particular dimension of the scale to improve student learning.

In the second dimension of the self-efficacy measure which is named as efficacy for classroom management strategies, the mean of Turkish middle school mathematics teachers is higher than the mean of American colleagues. In this dimension, it is basically assessed to evaluate the teachers' perception about themselves in terms of confidence in establishing a classroom climate where they can easily control disruptive behaviors, noise in the classroom. As it was explained above in the international assessment program about mathematics literacy, in Turkey classroom climate is below the mean of the OECD countries (PISA, 2012). This result clearly points out a problem among Turkish mathematics teachers in terms of providing the disciplinary climate in their classrooms. When the mean difference is considered for this comparison, the effect size value is small. Thus, compared to the teachers in the USA, there seems a wider problem in classroom management skills of the teachers. It seems that disciplinary environment in the classroom is related to the socioeconomic and cultural status of the parents (OECD, 2012; Mullis et al. 2012).

Turkey in general is below the average of OECD countries in the socioeconomic and cultural status indexed (ECSC). Based on this fact, it could be claimed that the Turkish mathematics teachers have to deal with lower socioeconomic status compared to the USA teachers and as a consequence of this, they have to deal with more disruptive behaviors in the classroom compared to the USA context. This could be the result of significant and important mean differences in this particular sub dimension.

Having higher means in both dimensions of the self-efficacy measures for the Turkish teachers could be the results of social desirability as well. Having classroom management skills high enough to control the disciplinary climate is definitely a socially desirable behavior for the Turkish teachers. It is also the expectation of the school administrators. It is also known that the Turkish society might have more social desirability since the approval by others is still quite an important thing to achieve (Crowne & Marlowe, 1960). In fact, in the present study, social desirability could be statistically controlled. It is one of the major limitations of the present study. For the further studies to be conducted for the Turkish teachers in line with self-efficacy measures, this particular interfering variable should be controlled.

In general, self-efficacy dimensions consist of the skills which could be developed through pedagogical formation provided by the school of education. Based on the findings of the present study, there is an obvious problem in the classroom management skills among the middle school mathematics teachers in Turkey. As was explained before, this particular variable explains an important portion of the variance in the PISA mathematics literacy score. Thus, in the teacher training programs in Turkey, developing mathematics teachers' classroom management skills should have a priority in order to establish a classroom environment that supports students learning.

5.1.2 Self-efficacy and Teacher Related Factors

In the regression analysis, bivariate regression was used in the Turkish and the USA samples. Even though the factors were similarly labeled in the analyses, since the items loaded on the factors were different across the samples, the regression analyses were carried out separately for the Turkish and USA samples for teacher related factors.

When teacher related factors were considered, the R-square values indicate low effect size values for different subscales of self-efficacy. In the Turkish sample, when teacher related factors were considered the R-square is 0.323 for efficacy of student support strategies and 0.186 for the efficacy of classroom management strategies. On the other hand, in the USA sample R-square value 0.196 for efficacy of student support strategies and 0.171 for efficacy of classroom management strategies. In the teacher related factors, teacher-teacher feedback, positive collective efficacy, negative collective efficacy, use of tools, de-privatization and collaboration for student development were the significant variables entered in the regression equations in the Turkish sample. Teacher respect and deprivatization, positive collective efficacy and negative collective efficacy were the variables entered in the regression equation in the USA sample. However, almost all the effect sizes obtained for each of the variables entered in the equation were within the limits of low effect size values.

In teacher related factors, the two dimensions entered into the regression equations in both cultures are the positive collective efficacy and negative collective efficacy. These two dimensions predicted both efficacy of classroom management strategies and efficacy of student support strategies.

In teacher related factors, positive collective efficacy and negative collective efficacy are two significant variables related to efficacy of student support strategies in both countries. Teacher efficacy of student support strategies is related to their positive expectations about student learning, teachers' confidence about taking care of their students. That is natural expectation to emphasize in any learning community. If teachers think that their students learn, they have high efficacy of student support strategies. This finding is supported by the other studies in the related

literature (Goddard & Goddard, 2001; Knoblauch and Hoy, 2008; Kurz and Knight, 2004; Lew and Koslowsky, 2009; Wahlstrom & Louis, 2008; Takahaski, 2011)

Negative collective efficacy is significantly and positively related with efficacy of student support strategies and classroom management strategies in both countries as well. In this particular dimension negative statements were reverse coded where disagreement with the negative collective efficacy and agreement with the positive collective efficacy indicate that teachers disagreed with negative statements and agreed with positive statements. Thus, as teachers disagree with difficulties of student learning, teachers' unconsciousness about unmotivated students and inability of teachers in dealing with diversity of student learning, their score in this respective sub-dimension increases. On the other hand, when reversely interpreted as teachers consider about motivation of their students and strive for student learning they have higher level of self-efficacy in terms of classroom management skills and student support strategies. This is an expected finding which has a strong support from the literature (Goddard & Goddard, 2001; Knoblauch and Hoy, 2008; Kurz and Knight, 2004; Lew and Koslowsky, 2009; Wahlstrom & Louis, 2008; Takahaski, 2011)

In the dimension of collaboration as was stated before, three sub-dimensions were defined in Turkish sample because of exploratory factor analysis. In fact, collaboration is defined as uni-dimensional construct in the original scale. In USA, all the items in this dimension were loaded at the two different construct. The reason of having different sub-dimensions of collaboration could be related to content of questions. When closely evaluated, items in this dimension were grouped under collaboration for student development, collaboration for instruction, and collaboration for classroom. The items in the collaboration for student development are basically related to whether teachers discuss launching a lesson, classroom management, goals of mathematic class, and instructional activities of mathematics classroom. This dimension is negatively related to efficacy of student support strategies in Turkish sample. Items related to whether teachers discuss supporting students in collaboration for instruction were loaded at a separate construct in the Turkish sample. The unexpected result is the negative relation of collaboration for student development in Turkish sample. This particular sub-dimension has 0 and 1

scoring where 1 stands for yes and 0 stands for no. In the Turkish sample, as teachers claim that they collaborate the activities such as introducing a lesson, grouping students in the classroom, classroom management, mathematical goals of a lesson and instructional activities with other teachers in their school, they have less efficacy in students support strategies. One explanation of this finding could be that as teachers suffer from low efficacy in terms of student support strategies they need more collaboration with other teachers in line with the activities covered in this particular sub-dimension. This could be also true for the use of tools sub-dimension. As teachers feel less efficient they stick with a certain textbook and teachers' manual to use in the classroom. This could bring more safety to mathematics teachers where using different teaching learning materials might require more self-confidence and consequently more self-efficacy.

For efficacy of student support strategies in addition to variables mentioned above teacher feedback, de-privatization dimensions are positively and collaboration for student development is negatively related to efficacy of student support strategies in Turkey. This is quite an expected result while providing teacher feedback from their colleagues and improving collaboration among teachers enhance their efficacy of student support strategies. This is a result, which is supported by previous studies as teachers' sense of self- efficacy is improved by observing successful models of teachers with similar teacher characteristics (Gorrel & Capron, 1988; Schunk, 1981, 1983, 1987; Schunk & Zimmerman, 1997, Goddard & Hoy and Hoy, 2004).

In addition to positive collective efficacy and negative collective efficacy in the USA sample, teacher-teacher respect with de-privatization is significantly related to efficacy of classroom management strategies. De-privatization and teacher-teacher respect were defined as two separate dimensions for the Turkish sample. On the other hand, these dimensions were somehow related to each other in the American sample where items in these respective dimensions were loaded on the same factor. The unexpected result is the negative relationship of this dimension with the student support strategies. This is rather a contradictory result with the literature (Hoy and (Tschannen-Moran, 1999; Da Costa and Riordan, 1996; Ball, 2010; Little, 2002; Hoy and Tarter, 2011). On the other hand there is one qualitative study which supports

this finding. Okpogba (2011) reported that neither enabling structure nor collegial trust was related to teaching self-efficacy and this result was supported by interview responses. Another explanation could be the requirement of more teacher respect and de-privatization could be the result of low self-efficacy among the American teachers in student support strategies. As they need more support in terms of student support strategies in the classroom which is reflected as low efficacy score for this particular sub-dimension, they need to have more support and interaction with the other teachers in their school and agree with the statements in respect and de-privatization dimension.

5.1.3 Self-efficacy and School Related Factors

When school related factors were considered, the R-square values indicate low effect size values for different subscales of self-efficacy. In the Turkish sample, when school related factors were considered the R-square is 0.108 for efficacy of student support strategies. No variable was found to be significant for classroom management skills in the Turkish sample. On the other hand, in the USA sample R-square value 0.143 for efficacy of student support strategies and 0.107 for efficacy of classroom management strategies. In the school related factors, teacher trust to principal and instructional leadership were the significant variables entered in the regression equation in Turkey. "Teacher trust to principal and instructional leadership", "principal assist to teacher", and "principal account to teacher" were the variables entered in the regression equation in the USA. However, almost all the effect sizes obtained for each of the variables entered in the equation were within the limits of low effect size value.

In school related factors, teacher trust to principal and instructional leadership are significant variables related to efficacy of student support strategies in both countries. Teachers' efficacy of student support strategies is related to their feeling about administration, their trust on their administration about mathematics knowledge, whether they can get help for instruction, getting feedback about instruction. If teachers think that they monitored by their administration about their mathematics instruction and ty feel safety at their school environment, they have high efficacy of student support strategies. This finding is supported by Nelson &

Sassi (2005). They found that principals support teachers' effective use of high quality mathematical tasks and questioning strategies that help students to make connections between mathematical ideas.

Instructional leadership is significantly related with efficacy of student support strategies in Turkey. If teachers think that their administrators have mathematical capability to monitor the instruction at the classrooms, set standards to increase mathematics knowledge and monitor students' progress, their efficacy of student support strategies increases. Instructional leadership is associated with managerial aspects of the teaching as feedback, accountability and assist processes to improve instruction. Teachers can judge their teaching profession to focus their efforts on what counts in educational process. This judgments increase their efficacy of student support strategies.

The construct teacher trust to principal and instructional leadership is positively related to efficacy of student support strategies. The positive relationship is expected in this sub-dimension, this finding is supported at the literature by Wahlstrom, and Louis (2008) found that teacher self-efficacy has modest effects on principal assist teacher, and teacher self-efficacy has a significant effect on instructional leadership.

For efficacy of student support strategies in addition to variables mentioned above principal assist to teacher and principal account to teacher dimensions are related to efficacy of student support strategies in USA. Principal account to teacher dimension is positively related to efficacy of student support strategies in USA. Teachers feel account to their principals since they feel confident about the mathematics knowledge of principals. School environment has a high level of trust, the efficacy of teachers is minimally affected by the principals' behavior, and when school environment has a low level trust, efficacy of teachers is more affected by the principals' behavior (Wahlstrom and Louis, 2008; Walker an d Slear, 2011, Tschannen-Moran and Gareis, 2004).

Principal assist to teacher dimension is negatively related to efficacy of student support strategies and efficacy of classroom management strategies in USA. The negative relationship between principal assist to teachers and the two self-efficacy

dimensions in the USA sample could be the results of having (receiving) more support from the principals for the teachers with lower efficacy beliefs.

In sum, there are differences in the results of the regression analyses as well as similarities. The results could be interpreted in terms of effective school climate in enhancing teachers' self-efficacy measures. This is a survey study and causational interpretations are hard to achieve. Thus, there is a need to elaborate the significant findings reported in the present study under experimental conditions.

The following inferences could be made for the Turkish educational system as a result of the findings of the present study:

1. It seems that the Turkish mathematics teachers have high self-efficacy beliefs. This could be partly the result of social desirability, but on the other hand, it could be claimed that teachers were in general confident about themselves with respect to classroom management and supporting students' learning in Turkey. Thus, this potential could be directed to a better student learning in mathematics classrooms. The Turkish MONE may produce policies in reflecting higher efficacy measures teachers to higher achievement among Turkish students. Higher efficacy beliefs could create a baseline for teachers to implement more effective teaching methods in the classrooms. Since they have confidence with respect to classroom management skills, more students oriented and hands on activities could be employed in the classroom without any disciplinary problem. The MONE can initiate effective student centered activities in the mathematics classroom.
2. It seems that a positive interaction among teachers in school is related to self-efficacy measures of the mathematics teachers. Moreover, the quality of school principal may positively change the teachers' efficacy beliefs. In the Turkish educational settings, effective school principals who deal with the classroom activities in mathematics in line with valuing and tracing student learning, cooperate with mathematics teachers in their preparation for the instructional activities can enhance teachers self-efficacy beliefs. This is more effective when there is

respect and support among the mathematics teachers in school. It seems that the school principal is the key person to create a positive climate in school settings to foster higher efficacy beliefs among the teachers. The Turkish MONE should seriously plan training for the school administrators with high standards who may deal with not only administrative duties, but also subject matter specific issues in mathematics as well. The leadership model which could be seen as effective here is an interactive school principal who supports the mathematics teachers in their attempts to develop a better classroom environment in their school. The Turkish MONE should develop higher standards for the school principals.

3. It seems that Turkish teachers who are less confident about themselves in classroom management and student support strategies use the textbooks as a support material more than the confident teachers do. This makes the content of the mathematics textbooks and teachers' guide more important. As in the case of training leaders, the Turkish MONE should improve the standards for textbooks used in the mathematics classrooms. This is rather the reflection of the methodology used in the classrooms. As was suggested in the first item above, when combined with the student centered mathematics activities in schools, the MONE should seriously consider the teaching method used in textbook writing. It is expected that the high quality textbooks written in line with an effective teaching methodology can be a good source for the mathematics teachers whose self-efficacy beliefs are not as high as the ones who do not go through with a single textbook in the mathematics classroom.
4. Teachers' observation of other teachers in the classroom seems an effective strategy for higher self-efficacy beliefs among the mathematics teachers. The Turkish MONE should develop a policy strategy to implement classroom observation among teachers in schools. The criteria for an effective observation should also be developed and suggested by the MONE.

5.2 Suggestions for the Further Research

- The Turkish sample size is 379 middle school mathematics teachers and the American sample size is 245 middle school mathematics teachers. These sample sizes are enough to generalize the results but using larger samples could be beneficial.
- Self-efficacy dimension was examined with the school related factors and teacher related factors but school characteristics and teachers background characteristics were not used in the analysis. School characteristics and teachers' background characteristics could be added to regression analysis to predict self-efficacy of teachers.
- Teachers' survey could be administered to different regions of the countries to analyze whether there is a regional difference of predicting self-efficacy of mathematics teachers across countries.
- How teachers self-efficacy predicts the students' mathematics achievement is a further question to analyze the relation between teachers self-efficacy with students' mathematics achievement.
- Social desirability was not controlled in the present study. In the developing countries, social desirability may play an important role in self-reported measures. The researcher in the present study suspected that this variable interfered with the teachers' efficacy measures. Thus, in the further studies about teachers' self-efficacy, this particular variable should be controlled in the analyses especially when different groups from different cultures are compared.
- MIST scale could be revised with respect to its' psychometric characteristic for the further studies. This may include revising the item content for a better reflection of the psychological construct being assessed, as well as the alternative options of the some parts of the questionnaire. Especially for dichotomous alternatives may restrict the variance in the item level that may hinder the statistical analysis.

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APPENDIX A

POPULATION AND SAMPLE DETAILS

Table A. 1 2013-2014 Academic Year Middle School Statistics of Selected Districts of Ankara (Public and Private)

Name of District	Number of Schools	Number of Grades	Number of Class	Number of Total Students			Number of Teachers		
				Male	Female	Total	Male	Female	Total
Çankaya	92	1682	1597	20416	19025	39441	748	2446	3194
Etimesgut	38	949	592	13771	12774	26545	405	1135	1540
Keçiören	74	2030	884	26136	24781	50917	930	1810	2740
Pursaklar	17	341	161	4829	4716	9545	176	267	443
Sincan	46	1266	606	17353	16599	33952	581	1049	1630
Yenimahalle	83	1532	1630	17751	17170	34921	724	1819	2543
Total	350	7800	5470	100256	95065	295620	2840	8526	12090

Table A.2 Population of preK-12 enrollments of USA districts for 2007-2008 school year. Source: U.S. Department of Education, National Center for Education Statistics (2010) (Rosenquist, 2014)

	Dist. A	**Dist. B**	**Dist. C**	**Dist. D**	**US School District (avg.)**	**All US Large Urban School Districts (avg.)**
Schools	100	150	250	200	7.0	60.6
Teachers	2,000	5,000	12,000	6,000	220	2,201
Students	30,000	80,000	160,000	100,000	3,469	36,220

APPENDIX B

ETHICAL PERMISSION

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
Yenilik ve Eğitim Teknolojileri Genel Müdürlüğü

Sayı : 81576613/605/942808 13/05/2013
Konu: Anket Uygulama İzni

ORTA DOĞU TEKNİK ÜNİVERSİTESİNE

İlgi: 10.05.2013 tarih ve 54850036-300-2294 sayılı yazı.

İlgi yazı ile Bakanlığımıza göndermiş olduğunuz Orta Doğu Teknik Üniversitesi Ortaöğretim Fen ve Matematik Alanları Eğitimi Ana Bilim Dalı doktora öğrencisi Sevim SEVGİ'nin "The Analyses of Mathematics Teachers's Characteristics and Their Relations to Students" konulu tezinde kullanılmak üzere oluşturduğu veri toplama araçlarına yönelik izin talebi, Genel Müdürlüğümüz tarafından incelenmiştir.

Onaylı bir örneği Bakanlığımızda muhafaza edilen, uygulama sırasında da mühürlü ve imzalı örnekten çoğaltılan 15 sayfa 34 sorudan oluşan veri toplama araçlarının, gönüllülük esas olmak kaydıyla, örneklem seçilen okullarda uygulanmasında bir sakınca görülmemektedir.

Bilgilerinizi ve gereğini rica ederim.

Mustafa KOÇ
Bakan a.
Genel Müdür

EK: Veri toplama aracı (15 Sayfa)

Güvenli Elektronik İmzalı
Aslı ile Aynıdır
14/05/2013

Bu belge, 5070 sayılı Elektronik İmza Kanununun 5 inci maddesi gereğince güvenli elektronik imza ile imzalanmıştır
Evrak teyidi http://evraksorgu.meb.gov.tr adresinden efd5-ae82-3ea6-924e-2dd2 kodu ile yapılabilir.

Atatürk Blv. 06648 Kızılay/ANKARA
Elektronik Ağ: www.meb.gov.tr
e-posta: adsoyad@meb.gov.tr

Ayrıntılı bilgi için: Ad SOYAD Ünvan
Tel: (0 312) XXX XX XX
Faks: (0 312) XXX XX XX

APPENDIX C

TURKISH VERSION OF MIST TEACHER SURVEY

Orta Doğu Teknik Üniversitesi
Orta Öğretim Fen ve Matematik Alanları Eğitimi Bölümü

Ortaokul Matematik Öğretmen Anketi

Ortaokul Matematik Öğretmen Anketi

Sevgili Öğretmenim,

Bu anket ortaokul matematik öğretmenlerinin, matematik öğretimi hakkında deneyimlerinini, okul ortamını, okul yönetici ile ilişkilerini, katıldıkları hizmet içi eğitimleri, ve diğer öğretmenler ile ilişkilerini araştırmak amacıyla hazırlanmıştır. Lütfen, aşağıda size yöneltilen soruları yanıtlarken, *aksi belirtilmediği sürece*, mevcut öğretim yılındaki (geçtiğimiz yaz tatili dahil) deneyimlerinizi düşünün. Ankette doğru ya da yanlış cevap yoktur. Anketteki soruların boş bırakılmaması çalışmamız açısından önemlidir. Verdiğiniz bilgiler kesinlikle gizli tutulacak ve sadece bilimsel araştırma amacıyla kullanılacaktır.

Araştırma Görevlisi
Sevim Sevgi

Bu anketin tamamlanması yaklaşık 40 dakika sürecektir.

Bölüm 1: Demografik bilgiler

Bu bölümde size ait demografik bilgilerinize ilişkin sorular sorulacaktır.

1 Adınız- Soyadınız:.....

2 Cinsiyetiniz:

- ☐ Kadın
- ☐ Erkek

3 Doğum Tarihiniz:.....

4 Öğretim düzeyiniz nedir?

- ☐ Lise
- ☐ Ön lisans (Yüksek okul, 2-3 yıllık)
- ☐ Lisans (Fakülte)
- ☐ Yüksek lisans
- ☐ Doktora

5 Kaç yıldır öğretmenlik yapıyorsunuz?.....

6 Bu okulda kaç yıldır öğretmenlik yapıyorsunuz ve okulunuzun adı nedir?
.....

7 Öğretmen olarak istihdam şekliniz nedir?

- ☐ Tam zamanlı
- ☐ Yarı zamanlı (tam zamanlı çalışmanın %50-90'ı kadar)
- ☐ Yarı zamanlı (tam zamanlı çalışmanın %50' sinden daha az)

8 Bu okulda öğretmen olarak istihdam şekliniz nedir?

☐ Kadrolu

☐ Bir eğitim-öğretim yılından daha uzun süreli sözleşmeli

☐ Bir eğitim-öğretim yılından daha kısa süreli sözleşmeli

9 Bu yıl hangi sınıf düzeylerinde ders veriyorsunuz?

Lütfen uygun olan tüm seçenekleri işaretleyiniz:

☐ 5.Sınıflar

☐ 6.Sınıflar

☐ 7.Sınıflar

☐ 8.Sınıflar

10 Bu okul dışında 5, 6, 7, veya 8. sınıf matematik öğretmeni olarak çalışmakta olduğunuz başka bir okul var mı?

☐ Evet

☐ Hayır

11 Bu okul dışında kaç okulun 5, 6, 7 veya 8. sınıflarında matematik dersine girdiğinizi belirtiniz.

……..

12 Bu okulda aşağıdaki çalışmalara bir haftada tahmini olarak kaç saat ayırdığınızı belirtiniz.

Okul içinde ders verme (tüm sınıfa, gruplar halinde ya da bire bir) ☐

Okul içinde veya dışında yapılan ders hazırlığı ve/ ve-ya planlaması (öğrenci çalışmalarını notlandırılması dahil) ☐

Okul içinde veya dışında gerçekleştirdiğiniz idari görevler ☐

Diğer (lütfen belirtiniz) ☐

Bölüm 2: Matematik Öğretmeni

Bu grupta sorular, öğretmenlerin okulda karşılaşabilecekleri sorunları daha iyi anlamamıza yardımcı olmak için tasarlanmıştır.

13 Lütfen, Sizin düşüncelerinizi en iyi yansıtan numarayı işaretleyiniz.

	1 Hiç	2	3 Az	4	5 Biraz	6	7 Sık sık	8	9 Bir çok
Matematik sınıfında sınıf ortamını bozan davranışları ne ölçüde kontrol edebilirsiniz?	○	○	○	○	○	○	○	○	○
Matematik dersine az ilgi gösteren öğrencilerinizi derse karşı ne derece motivasyonlarını sağlayabilirsiniz?	○	○	○	○	○	○	○	○	○
Matematik sınıfınızın ortamını bozan ve gürültü yapan bir öğrenciyi ne derece sakinleştirebilirsiniz?	○	○	○	○	○	○	○	○	○
Öğrencilerinizin matematik öğrenmeye değer vermelerine ne derece yardım edebilirsiniz?	○	○	○	○	○	○	○	○	○
Öğrencilerinize matematik alanındaki yeterliliklerini ölçen iyi sorular sormayı ne ölçüde becerebilirsiniz?	○	○	○	○	○	○	○	○	○
Öğrencilerinizin sınıf kurallarına uymasını ne ölçüde sağlayabilirsiniz?	○	○	○	○	○	○	○	○	○
Öğrencileri matematiği başarabileceklerine ne derece inandırabilirsiniz?	○	○	○	○	○	○	○	○	○
Öğretmenlik yaptığınız sınıflarda sınıf yönetimi sistemini ne derece sağlayabilirsiniz?	○	○	○	○	○	○	○	○	○

	1 Hiç	2	3 Az	4	5 Biraz	6	7 Sık sık	8	9 Bir çok
Matematik öğretimi yaptığınız sınıflarda farklı ölçme değerlendirme yaklaşımlarını ne ölçüde kullana bilirsiniz?	○	○	○	○	○	○	○	○	○
Öğrencilerin kafaları karıştığında onlara alternatif açıklamalar veya örnekler ne ölçüde sunabilirsiniz?	○	○	○	○	○	○	○	○	○
Öğrencilerin matematikte daha iyi olmaları için ailelere ne ölçüde destek olabilirsiniz?	○	○	○	○	○	○	○	○	○
Sınıfınızdaki her bir öğrencinin seviyesine uygun olarak dersinizi ne ölçüde uyarlayabilirsiniz?	○	○	○	○	○	○	○	○	○

Aşağıdaki soruları cevaplarken okulunuzdaki BÜTÜN MATEMATİK ÖĞRETMENLERİNİ düşünerek cevaplayınız.

14 Aşağıdaki ifadelere ne ölçüde katılıp katılmadığınızı belirtiniz.

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Bu okuldaki matematik öğretmenleri birbirlerine gerçekten önem verir.	○	○	○	○	○
Bu okuldaki matematik öğretmenleri birbirlerine saygı duyar.	○	○	○	○	○
Bu okuldaki matematik öğretmenleri birbirlerine güvenir.	○	○	○	○	○
Bu okuldaki diğer matematik öğretmenleri ile onların endişelerini, duygularını ve hayal kırıklıklarını paylaşmak mümkündür?	○	○	○	○	○

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Bu okuldaki matematik öğretmenleri okul gelişimine öncülük eden öğretmenlerin çabalarına saygı duyar.	○	○	○	○	○
Bu okuldaki matematik öğretmenleri kendi alanlarındaki uzmanların yeterliliklerine saygı duyar.	○	○	○	○	○

15 Aşağıdaki ifadelere ne ölçüde katılıp katılmadığınızı belirtiniz.

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Öğrencilerimiz okula öğrenmeye hazır olarak gelir.	○	○	○	○	○
Bu toplumda sunulan fırsatlar öğrencilerimizin matematik öğrenmelerini sağlamaya yardım eder.	○	○	○	○	○
Bu okuldaki matematik öğretmenleri öğrencilerinin motivasyonlarını sağlayacaklarına yönelik özgüvene sahiptir.	○	○	○	○	○
Bu okuldaki öğrencilerin matematik öğrenmeye karşı motivasyonları yoktur.	○	○	○	○	○
Aileler öğrencilerin öğrenmelerine katkı sağlar.	○	○	○	○	○
Bu okuldaki matematik öğretmenleri zor öğrencilerle baş eder.	○	○	○	○	○
Bu okuldaki öğrenciler güvenlikleri hakkında endişelendikleri için öğrenmeleri daha güçtür.	○	○	○	○	○
Bu okuldaki matematik öğretmenleri, eğer öğrenci öğrenmek istemiyorsa, o öğrenci ile ilgilenmeyi bırakır.	○	○	○	○	○
Bu okuldaki matematik öğretmenleri öğrencilerin disiplin problemleriyle başa çıkma becerisine sahip değillerdir.	○	○	○	○	○
Bu okuldaki matematik öğretmenleri her öğrencinin gerçekten öğrenebileceğine inanır.	○	○	○	○	○
Bu okuldaki matematik öğretmenlerinin öğrencilerin anlamlı öğrenmelerini yönlendirecek becerileri yok.	○	○	○	○	○

16 Normal bir okul haftasında günlük planlarınızı yaparken aşağıdakileri hangi sıklıkta kullanıyorsunuz?

	Hiç	1-2 Defa	3-5 Defa	6-10 Defa	10 Defadan Fazla
Ders Kitabı	○	○	○	○	○
Öğrenci Kitabı	○	○	○	○	○
Müfredat	○	○	○	○	○
Yardımcı Kitaplar	○	○	○	○	○
Öğretmen Kitabı	○	○	○	○	○
İnternet	○	○	○	○	○

Bölüm 3: Önümüzdeki birkaç soru DİĞER MATEMATİK ÖĞRETMENLERİ ile etkileşiminiz ile ilgilidir.

17 Matematik öğrettiğiniz okulun koşullarını düşünürseniz, aşağıdaki ifadeler sizin okulunuzdaki koşulları ne kadar yansıtmaktadır?

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Bu okuldaki matematik öğretmenleri düzenli olarak matematik öğretimi hakkındaki fikirlerini paylaşır.	○	○	○	○	○
Matematik öğretmenleri arasında nasıl matematik öğretileceği konusunda çok fazla anlaşmazlık var.	○	○	○	○	○
Matematik öğretiminde yeni fikirleri deneme konusunda diğer öğretmenlerin beni destekleyeceğini düşünürüm.	○	○	○	○	○
Bu okuldaki matematik öğretmenleri diğer sınıf düzeylerindeki eğitim ve öğretim faliyetleri ile koordine olmak için bilinçli çaba sarf eder.	○	○	○	○	○
Matematik öğretmenleri birbirlerinin görüşlerini sorgulamaya isteklidir.	○	○	○	○	○

18 Bu eğitim-öğretim yılı içerisinde şimdiye kadar, okulunuzda aşağıdaki olaylar kaç defa gerçekleşti?

	Hiç	1-2 Defa	3-5 Defa	6-10 Defa	10 Defadan Fazla
Bir matematik öğretmeni ders anlatışımı gözlemledi (en az 10 dakika).	○	○	○	○	○
Bir matematik öğretmeninin ders anlatımını gözlemledim (en az 10 dakika).	○	○	○	○	○
Diğer matematik öğretmenlerinden benim dersimi gözlemledikten sonra geri bildirim aldım.	○	○	○	○	○

Üsteki soruya cevabınız HİÇ ise, lütfen Okul Yönetimi kısmına geçiniz.

	Hiç	Az	Orta	Çok
Diğer matematik öğretmenlerinin gözlemleri sonucu aldığınız geri bildirimler öğretiminizi ne ölçüde etkiledi?	○	○	○	○

Bölüm 4: Önümüzdeki birkaç soru OKUL YÖNETİMİ ile etkileşimininiz ile ilgilidir.

20 Matematik öğretmeni olarak sizin performansınızın değerlendirilmesinden sorumlu okul yöneticisinin (müdür, müdür yardımcısı) adını aşağıdaki kutuya yazınız.

21 Lütfen, aşağıdaki ifadeleri yanıtlarken yukarıdaki yönetici ile geçtiğimiz eğitim-öğretim yılındaki etkileşimizi düşünün.

Önümüzdeki sorular yukarıda adını yazdığınız okul yöneticisi ile etkileşiminiz ile ilgilidir.

Bu eğitim-öğretim yılı içerisinde, aşağıdaki olaylar hangi sıklıkla gerçekleşmiştir?

	Hiç	1-2 Defa	3-5 Defa	6-10 Defa	11-20 Defa	20 Defadan Fazla
Ders anlatımım hakkında bu yönetici ile görüştüm.	○	○	○	○	○	○
Bu yönetici benim ders anlatışımı gözlemledi (en az 10 dakika).	○	○	○	○	○	○
Bu yönetici benim ders anlatışımı gözlemledikten sonra ders anlatışımı geliştirmeye yönelik bana geri bildirim verdi.	○	○	○	○	○	○
Bu yönetici benimle birlikte öğrencilerimin çalışmalarını gözden geçirdi.	○	○	○	○	○	○
Bu yönetici dersin nasıl başlatılması gerektiği konusunda geri bildirim verdi.	○	○	○	○	○	○
Bu yönetici, öğrencilerin çözümlerini tartıştıkları sınıf içi tartışmalarını nasıl sonlandırılacağım konusunda geri bildirim verdi.	○	○	○	○	○	○
Bu yönetici öğrenciler grup çalışması yaparken onların nasıl destekleneceği konusunda (örneğin nasıl soru sorulacağı) geri bildirimde bulundu.	○	○	○	○	○	○

22 Bu eğitim-öğretim yılı içerisinde şimdiye kadar, bu okul yöneticisi aşağıdaki konularda size ne sıklıkta yardımcı olmuştur?

	Hiç	Nadiren	Bazen	Sıklıkla
Kullanılacak matematik görevlerini (tasklarını) veya öğretim etkinliklerini belirlemek.	○	○	○	○
Dersin giriş kısmını tanıtmak.	○	○	○	○
Verilen bir dersin matematiksel hedeflerini anlamak.	○	○	○	○
Sınıf yönetimi.	○	○	○	○
Öğrencileri sınıfta gruplara ayırmak.	○	○	○	○
Grup çalışmalarında öğrencilere yardımcı olmak.	○	○	○	○
Öğrencilerin düşüncelerini açıklamalarını desteklemek.	○	○	○	○
Öğrencilerin birbirlerine düşüncelerini açıklamalarını desteklemek.	○	○	○	○
Öğrencilerin sınıfça tartıştıkları çözümleri sonlandırmaya öncülük etmek.	○	○	○	○
Matematik öğretimi ile ilgili materyalleri edinmek.	○	○	○	○
Müfredatı kazanımlar ile eşleştirmek.	○	○	○	○
Verileri incelemek.	○	○	○	○
Desteğe ihtiyacı olan öğrencilerin sınıftaki etkinliklere düzenli katılımını desteklemek.	○	○	○	○

23 Okul yöneticisini düşünerek, aşağıdaki ifadelere ne ölçüde katılıp katılmadığınızı belirtiniz.

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Bu okul yöneticisinin benim sınıfımı ziyaret etmesinin amacı, öğretim tekniklerimi geliştirmemde bana yardımcı olmaktır.	○	○	○	○	○
Bu okul yöneticisinin benim sınıfımı ziyaret etmesinin amacı resmi olarak öğretimimi değerlendirmektir.	○	○	○	○	○
Bu okul yöneticisi müfredatın etkin kullanılması sırasında yaşanılan zorlukları takdir eder.	○	○	○	○	○
Bu okul yöneticisi öğretimimi gözlemlediği zaman, öğrencilerin matematik hakkında neler söylediklerini dinler.	○	○	○	○	○
Bu okul yönetici öğretimimi gözlemlediği zaman, öğrencilerin kullandıkları matematik etkinliklerine/ görevlerine (tasklarına) dikkat eder.	○	○	○	○	○
Bu okul yöneticisinin benim sınıfımı ziyaret etmesinin amacı, öğrencilere ne tür sorular sorduğumu dinlemektir.	○	○	○	○	○
Bu okul yöneticisi bu okuldaki matematik öğretmenlerine saygı gösterir.	○	○	○	○	○
Bu okul yöneticisi matematik öğretmenlerinin uzmanlıklarına güvenir.	○	○	○	○	○
Bu okul yöneticisinin sözlerine güveniyorum.	○	○	○	○	○
Sorularım ve endişelerim olduğunda bu okul yöneticisine rahatlıkla gidebilirim.	○	○	○	○	○
Matematik öğretmeni yardım istediğinde bu okul yöneticisi yardım etmek için adım adım aşamaları takip eder.	○	○	○	○	○
Bu okulda bu okul yöneticisiyle duygularınızı, endişelerinizi, ve hayal kırıklıklarınızı paylaşmanız sorun olmaz.	○	○	○	○	○
Bu okul yöneticisi matematik öğretmenlerinin mesleki gelişimi ile kişisel olarak ilgilenir.	○	○	○	○	○
Bu okuldaki bu okul yöneticisi okulun sorunsuz çalışmasını sağlayan etkili bir yöneticidir.	○	○	○	○	○

24 Bu okul yöneticisini düşünerek, aşağıdakilerini ne ölçüde yaptığını belirtiniz.

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Matematik öğretim hedeflerinin karşılanmasına yönelik beklentilerini net bir şekilde ifade eder.	○	○	○	○	○
Matematik öğretiminin kalitesini aktif bir şekilde izler.	○	○	○	○	○
Öğrencilerin matematik öğrenme süreçlerini anlar.	○	○	○	○	○
Öğrencilerin matematik öğrenimleri için yüksek kazanımlar belirler.	○	○	○	○	○
Matematik öğretimi için yüksek kazanımlar koyar.	○	○	○	○	○
Matematik öğretmenlerinin hizmet içi eğitim (seminer) sırasında öğrendiklerini uygulamaları yönünde baskı yapar.	○	○	○	○	○
Öğrencilerin matematik dersindeki akademik başarılarını dikkatlice izler.	○	○	○	○	○
Benim sınıfımda neler olduğunu bilir.	○	○	○	○	○
Okulun vizyonu hakkında net bir iletişim kurar.	○	○	○	○	○
Matematik zümresi öğretmenlerinin öğretim planlama toplantılarına katılır.	○	○	○	○	○

25 Bu yönetici aşağıdakilerini ne ölçüde yapmanızı istemektedir?

	Hiç	Az	Orta	Çok
Planlanan öğretim planına bağlı kalmamı.	○	○	○	○
Öğrencilerin çözümlerini sınıf içinde tartışırken sonuca bağlamamı.	○	○	○	○
Öğrencilerin grup çalışması yapmalarını desteklememi.	○	○	○	○
Diğer matematik öğretmenleri ile işbirliği yapmamı.	○	○	○	○
Diğer matematik öğretmenlerinin öğretimlerini gözlememi.	○	○	○	○
Öğretimsel problemlerle karşılaştığımda kendisini kaynak olarak kullanmamı.	○	○	○	○
Ders planlarımı gözden geçirilmek üzere hazır bulundurmamı.	○	○	○	○

	Hiç	Az	Orta	Çok
Diğer matematik öğretmenlerinin öğretimlerini geliştirmek için onlara yardımcı olmamı.	○	○	○	○
Bir ders anlatmamı (veya kısa bir tanıtımı).	○	○	○	○
Desteğe ihtiyacı olan öğrencilerin, sınıftaki etkinliklere düzenli katılımlarını desteklememi.	○	○	○	○
Matematik zümre başkanı ile belirli öğretim uygulamalarını çalışmamı.	○	○	○	○

Bölüm 5: Önümüzdeki birkaç soru katıldığınız HİZMET İÇİ EĞİTİMLER ile ilgilidir.

26 Bu akademik yıl içerisinde (geçtiğimiz yaz tatili dahil) toplam kaç saatinizi matematik veya matematik eğitimi ile ilgili çalıştay, hizmet içi eğitim veya seminerlere ayırdınız?

27 Hizmet içi eğitim sırasında aşağıdaki konular ne ölçüde ele alındı, eğer ele alındıysa bu konular sizin öğretiminizi ne ölçüde etkiledi? (Her ifade için bir seçeneği işaretleyiniz, eğer konu ele alınmadıysa ikinci bölümü boş bırakınız.)

	Konu İşlendi				Öğretimi Etkiledi			
	Hiç	Az	Orta	Çok	Hiç	Az	Orta	Çok
Kazanımlara veya ölçme-değerlendirme standartlarına erişim.	○	○	○	○	○	○	○	○
Hangi matematik görevlerinin (tasklarının) veya öğretim etkinliklerini kullanılacağını.	○	○	○	○	○	○	○	○
Bir ders anlatmak (veya kısa bir ders tanıtımı).	○	○	○	○	○	○	○	○
Verilen bir dersin matematiksel kazanımlarını anlamak.	○	○	○	○	○	○	○	○
Sınıf yönetimi.	○	○	○	○	○	○	○	○
Öğrencileri gruplara ayırmak.	○	○	○	○	○	○	○	○

	Konu İşlendi				Öğretimi Etkiledi			
	Hiç	Az	Orta	Çok	Hiç	Az	Orta	Çok
Öğrenciler grup çalışması yaparken onları desteklemek (örneğin: soru sorarak)	○	○	○	○	○	○	○	○
Öğrencilerinin kendi düşüncelerini ifade etmelerini desteklemek.	○	○	○	○	○	○	○	○
Öğrencilerin birbirlerinin düşüncelerini ifade etmelerini desteklemek.	○	○	○	○	○	○	○	○
Matematik alan bilgimi artırmak.	○	○	○	○	○	○	○	○
Öğrencilerin problem çözümlerini sonuçlandıran sınıf içi tartışmaları yönetmek.	○	○	○	○	○	○	○	○
Müfredatın etkin kullanımı.	○	○	○	○	○	○	○	○

28 Bu akademik yıl içerisinde (geçtiğimiz yaz tatili dahil) katıldığınız hizmet içi eğitim hakkında, aşağıdaki ifadelere ne ölçüde katılıp katılmadığınızı belirtiniz. Hizmet içi eğitim:

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Diğer matematik öğretmenleri ile verimli çalışma olanakları sağladı.	○	○	○	○	○
İnanmadığım uygulamaları savundu.	○	○	○	○	○
Tüm öğrencilerin katıldığı, sorguladıkları problem çözme durumlarının uygulanmasına yönelik stratejileri kullanmamı sağladı.	○	○	○	○	○
Hangi öğretim metodunun, öğrencilerim için daha iyi olduğuna dair inanç ve varsayımlarımı sorgulamamı sağladı.	○	○	○	○	○
Çok fazla konuya odaklandı.	○	○	○	○	○
Birbiriyle ilişkili oturumlar birbiri ile başarılı bir şekilde bağlanmıştı (birbirinde bağımsız oturumlar değildi).	○	○	○	○	○

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Öğretim performansının değerlendirilmesi ile tutarlıydı.	○	○	○	○	○
Öğretimim için belirlediğim amaçlarım ile tutarlıydı.	○	○	○	○	○

Bölüm 6: Matematik Öğretmenleri Arası İletişim

29 Okulunuzdaki matematik öğretmenleri için düzenlenen toplantılarda (örneğin, sınıf düzeyinde toplantılar, zümre toplantıları) aşağıdaki konulardan hangilerini tartışıyorsunuz (Sizin için uygun olanları işaretleyiniz)?

- ☐ Hangi öğretim etkinliklerinin veya durumlarının kullanılması
- ☐ Dersin giriş kısmı
- ☐ Belirli bir matematik dersinin kazanımları
- ☐ Sınıf yönetimi
- ☐ Sınıftaki öğrencileri gruplandırma
- ☐ Öğrencileri grup çalışması yaparken destekleme (örneğin soru sorarak)
- ☐ Öğrencilerin düşüncelerini açıklamalarını destekleme (örneğin soru sorarak)
- ☐ Öğrencilerin problem çözümlerini tartıştıkları sınıf içi tartışmaları sonuca bağlama
- ☐ Diğerleri
- ☐ Matematik öğretmenleri için düzenlenen toplantılara katılmadım.

30 Bu toplantılara, genelde kimler katılıyor (Örneğin, bütün 8. sınıf öğretmenleri, okuldaki bütün matematik öğretmenleri, matematik zümre başkanı, idareciler)?

31 Okulunuzda düzenlenen toplantılar dışında matematik öğretimi hakkında konuşabileceğiniz kişiler var mı?

- ○ Evet
- ○ Hayır

32 Düzenli toplantıların dışında matematik öğretimi hakkında konuştuğunuz kişinin isim ve görevi nedir? Lütfen, adını ve soyadını (eğer biliyorsanız) yazınız, ve bu kişinin görevleri ve rolü hakkında detaylı bilgi veriniz (örneğin, benim okulumda öğretmen, başka bir okulda öğretmen, müdür yardımcısı, müdür, matematik öğretmeni). Lütfen bir isim yazınız. Takip eden soruda daha fazla isim yazmak için fırsatınız olacaktır.

İsim:

Görev:

33 Düzenli toplantılar dışında, yukarıda ismini yazdığım kişi ile aşağıdaki konuları konuşurum (Sizin için uygun olanların tümünü işaretleyiniz).

- ☐ Hangi öğretim etkinliklerinin veya durumlarının (tasklarının) kullanılması
- ☐ Dersin giriş kısmı
- ☐ Belirli bir matematik dersinin kazanımları
- ☐ Sınıf yönetimi
- ☐ Sınıftaki öğrencileri gruplandırma
- ☐ Öğrencileri grup çalışması yaparken destekleme (örneğin soru sorarak)
- ☐ Öğrencilerin düşüncelerini açıklamalarını destekleme (örneğin soru sorarak)
- ☐ Öğrencilerin problem çözümlerini tartıştıkları sınıf içi tartışmaları sonuca bağlama
- ☐ Diğerleri
- ☐ Matematik öğretmenleri için düzenli toplantılara katılmadım

34 Yukarıda belirttiğiniz kişi ile düzenli toplantılar dışında hangi sıklıkta görüşüyorsunuz?

- ☐ Günlük veya hemen hemen hergün
- ☐ Haftada bir veya iki defa
- ☐ Ayda bir veya iki defa
- ☐ Yılda birkaç defa

Bu anketin sonuna ulaştınız. Sizin okulunuzdaki matematik öğretimi hakkında daha fazla bilgi edinmemize yardımcı olduğunuz için teşekkür ederiz.

Sorularınız için bize aşağıdaki adresten ulaşabilirsiniz.

Sevim Sevgi

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APPENDIX D

ITEMS OF TPTO AND DESCRIPTIVE STATISTICS FOR TURKEY

Table D1 Items of TPTO and Descriptive Statistics for Turkey (N=379)

Items	**Coding**	**Mean**	***SD***
Lütfen, Sizin düşüncelerinizi en iyi yansıtan numarayı işaretleyiniz			
Matematik sınıfında sınıf ortamını bozan davranışları ne ölçüde kontrol edebilirsiniz?(ClassMan_a)	1=Hiç 2 3=Az 4 5=Biraz 6 7=Sık sık 8 9=Bir çok	7.54	1.257
Matematik dersine az ilgi gösteren öğrencilerinizi derse karşı ne derece motivasyonlarını sağlayabilirsiniz?(SSupport_b)		6.46	1.387
Matematik sınıfınızın ortamını bozan ve gürültü yapan bir öğrenciyi ne derece sakinleştirebilirsiniz?(ClassMan_c)		7.18	1.334
Öğrencilerinizin matematik öğrenmeye değer vermelerine ne derece yardım edebilirsiniz?(SSupport_d)		7.22	1.353
Öğrencilerinize matematik alanındaki yeterliliklerini ölçen iyi sorular sormayı ne ölçüde becerebilirsiniz?(SSupport_e)		7.71	1.183
Öğrencilerinizin sınıf kurallarına uymasını ne ölçüde sağlayabilirsiniz?(ClassMan_f)		7.56	1.157
Öğrencileri matematiği başarabileceklerine ne derece inandırabilirsiniz?(SSupport_g)		6.99	1.292
Öğretmenlik yaptığınız sınıflarda sınıf yönetimi sistemini ne derece sağlayabilirsiniz?(ClassMan_h)		7.66	1.217
Matematik öğretimi yaptığınız sınıflarda farklı ölçme değerlendirme yaklaşımlarını ne ölçüde kullana bilirsiniz?(SSupport_i)		6.60	1.516

Table D1 (Continued)

Items		**Mean**	***SD***
Öğrencilerin kafaları karıştığında onlara alternatif açıklamalar veya örnekler ne ölçüde sunabilirsiniz?(SSupport_j)		7.90	1.058
Öğrencilerin matematikte daha iyi olmaları için ailelere ne ölçüde destek olabilirsiniz?(SSupport _k)		6.35	1.666
Sınıfınızdaki her bir öğrencinin seviyesine uygun olarak dersinizi ne ölçüde uyarlayabilirsiniz?(SSupport_l)		6.49	1.723
Aşağıdaki ifadelere ne ölçüde katılıp katılmadığınızı belirtiniz.			
Bu okuldaki matematik öğretmenleri birbirlerine gerçekten önem verir.(Respect_a)	1=Kesinlikle Katılmıyorum 2= Katılmıyorum 3=Kararsızım 4=Katılıyorum 5=Kesinlikle Katılıyorum	4.38	.770
Bu okuldaki matematik öğretmenleri birbirlerine saygı duyar.(Respect_b)		4.51	.706
Bu okuldaki matematik öğretmenleri birbirlerine güvenir.(Respect_c)		4.39	.786
Bu okuldaki diğer matematik öğretmenleri ile onların endişelerini, duygularını ve hayal kırıklıklarını paylaşmak mümkündür?(Respect_d)		4.30	.850
Bu okuldaki matematik öğretmenleri okul gelişimine öncülük eden öğretmenlerin çabalarına saygı duyar.(Respect_e)		4.41	.723
Bu okuldaki matematik öğretmenleri kendi alanlarındaki uzmanların yeterliliklerine saygı duyar.(Respect_f)		4.46	.698
Aşağıdaki ifadelere ne ölçüde katılıp katılmadığınızı belirtiniz.			
Öğrencilerimiz okula öğrenmeye hazır olarak gelir.(PositiveCE_a)	1=Kesinlikle Katılmıyorum 2= Katılmıyorum 3=Kararsızım 4=Katılıyorum 5=Kesinlikle Katılıyorum	2.70	.945
Bu toplumda sunulan fırsatlar öğrencilerimizin matematik öğrenmelerini sağlamaya yardım eder.(PositiveCE_b)		3.07	1.024
Bu okuldaki matematik öğretmenleri öğrencilerinin motivasyonlarını sağlayacaklarına yönelik özgüvene sahiptir.(PositiveCE_c)		4.14	.744
Bu okuldaki öğrencilerin matematik öğrenmeye karşı motivasyonları yoktur.(PositiveCE_d)		2.77	1.087
Aileler öğrencilerin öğrenmelerine katkı sağlar.(PositiveCE_e)		3.21	1.010

Table D1 (Continued)

Items		**Mean**	***SD***
Bu okuldaki matematik öğretmenleri zor öğrencilerle baş eder.(PositiveCE_f)		3.94	.774
Bu okuldaki öğrenciler güvenlikleri hakkında endişelendikleri için öğrenmeleri daha güçtür.(NegativeCE_g)		1.93	1.023
Bu okuldaki matematik öğretmenleri, eğer öğrenci öğrenmek istemiyorsa, o öğrenci ile ilgilenmeyi bırakır.(NegativeCE_h)		2.06	.923
Bu okuldaki matematik öğretmenleri öğrencilerin disiplin problemleriyle başa çıkma becerisine sahip değillerdir.(NegativeCE_i)		1.73	.768
Bu okuldaki matematik öğretmenleri her öğrencinin gerçekten öğrenebileceğine inanır.(PositiveCE_j)		3.82	.832
Bu okuldaki matematik öğretmenlerinin öğrencilerin anlamlı öğrenmelerini yönlendirecek becerileri yok.(NegativeCE_k)		1.61	.737
Normal bir okul haftasında günlük planlarınızı yaparken aşağıdakileri hangi sıklıkta kullanıyorsunuz?			
Ders Kitabı (Tools_a)	1=Hiç 2=1-2 Defa 3=3-5 Defa 4=6-10 defa 5= 10 Defadan Fazla	3.50	1.141
Öğrenci Kitabı (Tools_b)		3.15	1.155
Matematik öğrettiğiniz okulun koşullarını düşünürseniz, aşağıdaki ifadeler sizin okulunuzdaki koşulları ne kadar yansıtmaktadır?			
Bu okuldaki matematik öğretmenleri düzenli olarak matematik öğretimi hakkındaki fikirlerini paylaşır.(Deprivati_a)	1=Kesinlikle Katılmıyorum 2= Katılmıyorum 3=Kararsızım 4=Katılıyorum 5=Kesinlikle Katılıyorum	4.08	.834
Matematik öğretiminde yeni fikirleri deneme konusunda diğer öğretmenlerin beni destekleyeceğini düşünürüm.(Deprivati_c)		4.14	.740
Bu okuldaki matematik öğretmenleri diğer sınıf düzeylerindeki eğitim ve öğretim faaliyetleri ile koordine olmak için bilinçli çaba sarf eder.(Deprivati_d)		4.14	.729
Matematik öğretmenleri birbirlerinin görüşlerini sorgulamaya isteklidir.(Deprivati_e)		3.81	.873

Table D1 (Continued)

Items		**Mean**	***SD***
Bu eğitim-öğretim yılı içerisinde şimdiye kadar, okulunuzda aşağıdaki olaylar kaç defa gerçekleşti?	1=Hiç 2=1-2 Defa 3=3-5 Defa 4=6-10 defa 5= 10 Defadan Fazla		
Bir matematik öğretmeni ders anlatışımı gözlemledi (en az 10 dakika).(T_Feedback_a)		1.37	.804
Bir matematik öğretmeninin ders anlatımını gözlemledim (en az 10 dakika).(T_Feedback_b)		1.34	.792
Diğer matematik öğretmenlerinden benim dersimi gözlemledikten sonra geri bildirim aldım.(T_Feedback_c)		1.28	.666
Okulunuzdaki matematik öğretmenleri için düzenlenen toplantılarda (örneğin, sınıf düzeyinde toplantılar, zümre toplantıları) aşağıdaki konulardan hangilerini tartışıyorsunuz (Sizin için uygun olanları işaretleyiniz)?			
Hangi öğretim etkinliklerinin veya durumlarının kullanılması.(CollaStudent_a)	1= Evet 0= Hayır	.79	.398
Dersin giriş kısmı. (CollaStudent_b)		.28	.435
Belirli bir matematik dersinin kazanımları (CollaStudent_c)		.69	.450
Sınıf yönetimi. (CollaStudent_d)		.69	.450
Sınıftaki öğrencileri gruplandırma. (CollaStudent_e)		.25	.422
Öğrencileri grup çalışması yaparken destekleme (örneğin soru sorarak). (CollaInst_f)		.47	.484
Öğrencilerin düşüncelerini açıklamalarını destekleme (örneğin soru sorarak) (CollaInst_g)		.59	.478
Öğrencilerin problem çözümlerini tartıştıkları sınıf içi tartışmaları sonuca bağlama (CollaInst_h)		.51	.485

APPENDIX E

ITEMS OF TPTO AND DESCRIPTIVE STATISTICS FOR USA

Table E1 Items of TPTO and Descriptive Statistics for USA (N=245)

Items	**Coding**	**Mean**	***SD***
This set of questions is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinions about each of the statements below by selecting the appropriate number.			
To what extent can you control disruptive behavior in your mathematics classroom? (ClassMan_a)	1=Not at all 2 3=Very Little 4 5= Somewhat 6 7=Quite a Bit 8 9=A Great Deal	7.03	1.588
To what extent can you motivate students who show low interest in mathematics? (SSupport_b)		5.93	1.451
To what extent can you calm a student who is disruptive or noisy in your mathematics classroom? (ClassMan_c)		6.77	1.447
To what extent can you help your students' value learning mathematics? (SSupport_d)		6.37	1.520
To what extent can you craft good questions for your students related to mathematics? (SSupport_e)		7.06	1.326
To what extent can you get students to follow classroom rules? (ClassMan_f)		7.18	1.467
To what extent can you get students to believe they can do well in mathematics? (SSupport_g)		6.62	1.355
How well can you establish a classroom management system in the classes you teach? (ClassMan_h)		7.33	1.332

Table E1 (Continued)

Items		**Mean**	***SD***
To what extent can you use a variety of assessment strategies in your mathematics teaching? (SSupport_i)		7.11	1.522
To what extent can you provide an alternative explanation or example when students are confused? (SSupport_j)		7.59	1.215
How well can you assist families in helping their children do well in mathematics? (SSupport_k)		6.04	1.802
How much can you do to adjust your lessons to the proper level for individual students? (SSupport_l)		6.71	1.591
To what extent do you agree or disagree with the following statements.			
Math teachers in this school really care about each other. (Respect_a)	1=Strongly Disagree 2=Disagree 3=Neither Disagree or Agree 4=Agree 5=Strongly Agree	3.98	.884
Math teachers in this school respect each other. (Respect _b)		4.11	.826
Math teachers in this school trust each other. (Respect _c)		3.98	.884
It's OK in this school to discuss feelings, worries, and frustrations with other math teachers. (Respect_d)		3.90	.944
Math teachers respect other teachers who take the lead in school improvement efforts. (Respect _e)		3.93	.848
Math teachers at this school respect those colleagues who are expert at their craft. (Respect_f)		4.01	.841
To what extent do you agree or disagree with the following statements:			
Our students come to school ready to learn. (PositiveCE_a)	1=Strongly Disagree 2=Disagree 3=Neither Disagree or Agree 4=Agree 5=Strongly Agree	2.78	.959
The opportunities in this community help to ensure that our students will learn. (PositiveCE_b)		2.98	.958
Math teachers here are confident they will be able to motivate their students. (PostiveCE_c)		3.38	.833
Students here just aren't motivated to learn. (PositiveCE_d)		2.98	.918
Home life provides so many advantages the students here are bound to learn. (PositiveCE_e)		2.16	.927
Math teachers in this school are able to get through to difficult students. (PositiveCE_f)		3.35	.788
Learning is more difficult at this school because students are worried about their safety. (NegativeCE_g)		2.21	.855
If a child doesn't want to learn, teachers here give up on him or her. (NegativeCE_h)		2.02	.861

Table E1 (Continued)

Items		**Mean**	***SD***
Math teachers in this school do not have the skills to deal with student disciplinary problems. (NegativeCE_i)		2.15	.768
Math teachers in this school really believe every child can learn. (PositiveCE_j)		3.87	.742
Math teachers here don't have the skills needed to produce meaningful student learning. (NegativeCE_k)		2.02	.846
In a typical school week, how often do you use the following when planning instruction?			
CMP2 Textbook (Tools_a)	1= Never 2=1-2 Times 3=3-5 Times 4=6-10 Times 5=More than 10 times	2.92	1.168
CMP2 Teacher's Manual (Tools_b)		2.73	1.195
Now consider conditions of mathematics teaching. How well does each of the following statements describe conditions in your school?			
Math teachers in this school regularly share ideas about mathematics instruction (Deprivati_a)	1=Strongly Disagree 2=Disagree 3=Neither Disagree or Agree 4=Agree 5=Strongly Agree	3.99	.977
I feel supported by other teachers to try out new ideas in teaching mathematics (Deprivati_c)		3.95	.867
Math teachers at this school make a conscious effort to coordinate their teaching with instruction at other grade levels (Deprivati_d)		3.52	1.044
Math teachers are willing to question one another's views (Deprivati_e)		3.71	.730
So far this school year how often have the following events occurred?			
A mathematics teacher [other than an LCT] observed my teaching (for at least 10 minutes) (T_Feedback_a)	1= Never 2=1-2 Times 3=3-5 Times 4=6-10 Times 5=More than 10 times	2.26	1.202
I observed a mathematics teacher (other than an LCT) teach in a classroom (for at least 10 minutes) (T_Feedback_b)		2.07	1.134
I received feedback from other math teachers (other than an LCT) after they observed my teaching (T_Feedback_c)		2.02	.882

Table E1 (Continued)

Which of the following topics do you discuss in scheduled meetings (e.g.. grade level math meetings. department meetings) with math teachers at your school (select all that apply)?	1= Yes 0= No		
Which math tasks or instructional activities to use (CollaStudent_a)		.90	.298
Introducing (or launching) a lesson (CollaStudent_b)		.63	.477
The mathematical goals for a given lesson (CollaStudent_c)		.75	.429
Classroom management (CollaStudent_d)		.37	.477
Grouping students in the classroom (CollaStudent_e)		.42	.486
Supporting students (e.g., questioning) as they work in groups (CollaInst _f)		.57	.490
Supporting students to explain their own thinking (CollaInst_g)		.56	.491
Leading a concluding whole-class discussion of students solutions (CollaInst_h)		.39	.482

APPENDIX F

ITEMS OF TPSA AND DESCRIPTIVE STATISTICS FOR TURKEY

Table F1 Items of TPSA and Descriptive Statistics for Turkey

Items	**Coding**	**Mean**	***SD***
Bu eğitim-öğretim yılı içerisinde, aşağıdaki olaylar hangi sıklıkla gerçekleşmiştir?			
Ders anlatımım hakkında bu yönetici ile görüştüm.(Feedback_a)	1=Hiç 2=1-2 Defa 3=3-5 Defa 4=6-10 defa 5= 11-20 Defadan Fazla 6=20 Defadan Fazla	1.76	.989
Bu yönetici benim ders anlatışımı gözlemledi (en az 10 dakika).(Feedback_b)		1.45	.750
Bu yönetici benim ders anlatışımı gözlemledikten sonra ders anlatışımı geliştirmeye yönelik bana geri bildirim verdi.(Feedback_c)		1.31	.630
Bu yönetici benimle birlikte öğrencilerimin çalışmalarını gözden geçirdi.(Feedback_d)		1.53	.818
Bu yönetici dersin nasıl başlatılması gerektiği konusunda geri bildirim verdi.(Feedback_e)		1.38	.833
Bu yönetici, öğrencilerin çözümlerini tartıştıkları sınıf içi tartışmalarını nasıl sonlandırılacağım konusunda geri bildirim verdi.(Feedback_f)		1.38	.778
Bu yönetici öğrenciler grup çalışması yaparken onların nasıl destekleneceği konusunda (örneğin nasıl soru sorulacağı) geri bildirimde bulundu.(Feedback_g)		1.37	.745

Table F1 (Continued)

Items		**Mean**	***SD***
Bu eğitim-öğretim yılı içerisinde şimdiye kadar, bu okul yöneticisi aşağıdaki konularda size ne sıklıkta yardımcı olmuştur?			
Kullanılacak matematik görevlerini (tasklarını) veya öğretim etkinliklerini belirlemek.(Assist_a)	1=Hiç 2=Nadiren 3=Bazen 4=Sıklıkla	1.86	.994
Dersin giriş kısmını tanıtmak.(Assist_b)		1.43	.778
Verilen bir dersin matematiksel hedeflerini anlamak.(Assist_c)		1.49	.798
Sınıf yönetimi.(Assist_d)		1.85	.963
Öğrencileri sınıfta gruplara ayırmak.(Assist_e)		1.39	.736
Grup çalışmalarında öğrencilere yardımcı olmak (Assist_f)		1.49	.799
Öğrencilerin düşüncelerini açıklamalarını desteklemek.(Assist_g)		1.84	.985
Öğrencilerin birbirlerine düşüncelerini açıklamalarını desteklemek.(Assist_h)		1.88	1.004
Öğrencilerin sınıfça tartıştıkları çözümleri sonlandırmaya öncülük etmek.(Assist_i)		1.99	1.038
Matematik öğretimi ile ilgili materyalleri edinmek.(Assist_j)		2.40	1.126
Müfredatı kazanımlar ile eşleştirmek.(Assist_k)		1.95	1.077
Verileri incelemek.(Assist_l)		2.06	1.118
Desteğe ihtiyacı olan öğrencilerin sınıftaki etkinliklere düzenli katılımını desteklemek.(Assist_m)		2.12	1.115
Okul yöneticisini düşünerek, aşağıdaki ifadelere ne ölçüde katılıp katılmadığınızı belirtiniz.			
Bu okul yöneticisinin benim sınıfımı ziyaret etmesinin amacı, öğretim tekniklerimi geliştirmemde bana yardımcı olmaktır.(Trust_a)	1=Kesinlikle Katılmıyorum 2= Katılmıyorum 3=Kararsızım 4=Katılıyorum 5=Kesinlikle Katılıyorum	3.28	1.231
Bu okul yöneticisinin benim sınıfımı ziyaret etmesinin amacı resmi olarak öğretimimi değerlendirmektir.(Trust_b)		3.56	1.051
Bu okul yöneticisi müfredatın etkin kullanılması sırasında yaşanılan zorlukları takdir eder. (Trust_c)		3.49	.984

Table F1 (Continued)

Items		**Mean**	***SD***
Bu okul yöneticisi öğretimimi gözlemlediği zaman, öğrencilerin matematik hakkında neler söylediklerini dinler.(Trust_d)		3.58	.992
Bu okul yönetici öğretimimi gözlemlediği zaman, öğrencilerin kullandıkları matematik etkinliklerine/ görevlerine (tasklarına) dikkat eder.(Trust_e)		3.45	1.051
Bu okul yöneticisinin benim sınıfımı ziyaret etmesinin amacı, öğrencilere ne tür sorular sorduğumu dinlemektir.(Trust_f)		3.04	1.081
Bu okul yöneticisi bu okuldaki matematik öğretmenlerine saygı gösterir.(Trust_g)		4.22	.875
Bu okul yöneticisi matematik öğretmenlerinin uzmanlıklarına güvenir. (Trust_h)		4.16	.861
Bu okul yöneticisinin sözlerine güveniyorum.(Trust_i)		4.10	.918
Sorularım ve endişelerim olduğunda bu okul yöneticisine rahatlıkla gidebilirim.(Trust_j)		4.06	1.022
Matematik öğretmeni yardım istediğinde bu okul yöneticisi yardım etmek için adım adım aşamaları takip eder.(Trust_k)		3.92	1.002
Bu okulda bu okul yöneticisiyle duygularınızı, endişelerinizi ve hayal kırıklıklarınızı paylaşmanız sorun olmaz. (Trust_l)		3.86	1.027
Bu okul yöneticisi matematik öğretmenlerinin mesleki gelişimi ile kişisel olarak ilgilenir.(Trust_m)		3.54	1.094
Bu okuldaki bu okul yöneticisi okulun sorunsuz çalışmasını sağlayan etkili bir yöneticidir.(Trust_n)		3.93	1.020
Bu okul yöneticisini düşünerek, aşağıdakilerini ne ölçüde yaptığını belirtiniz.			
Matematik öğretim hedeflerinin karşılanmasına yönelik beklentilerini net bir şekilde ifade eder.(Leadership_a)	1=Kesinlikle Katılmıyorum 2= Katılmıyorum 3=Kararsızım 4=Katılıyorum 5=Kesinlikle Katılıyorum	3.72	.913
Öğrencilerin matematik öğrenme süreçlerini anlar.(Leadership_c)		3.29	1.002
Öğrencilerin matematik öğrenimleri için yüksek kazanımlar belirler.(Leadership_d)		3.18	1.048

Table F1 (Continued)

Items		**Mean**	***SD***
Matematik öğretmenlerinin hizmet içi eğitim (seminer) sırasında öğrendiklerini uygulamaları yönünde baskı yapar.(Leadership_f)		2.48	.917
Öğrencilerin matematik dersindeki akademik başarılarını dikkatlice izler. (Leadership_g)		3.47	1.030
Benim sınıfımda neler olduğunu bilir.(Leadership_h)		3.30	1.054
Okulun vizyonu hakkında net bir iletişim kurar.(Leadership_i)		3.70	.933
Matematik zümresi öğretmenlerinin öğretim planlama toplantılarına katılır.(Leadership_j)		3.52	1.043
Bu yönetici aşağıdakilerini ne ölçüde yapmanızı istemektedir?			
Planlanan öğretim planına bağlı kalmamı.(Account_a)	1 =Hiç 2= Az 3= Orta 4= Çok	3.49	.764
Öğrencilerin çözümlerini sınıf içinde tartışırken sonuca bağlamamı.(Account_b)		3.35	.862
Öğrencilerin grup çalışması yapmalarını desteklememi.(Account_c)		3.03	.980
Diğer matematik öğretmenlerinin öğretimlerini gözlememi.(Account_e)		2.59	1.141
Öğretimsel problemlerle karşılaştığımda kendisini kaynak olarak kullanmamı.(Account_f)		2.58	1.071
Ders planlarımı gözden geçirilmek üzere hazır bulundurmamı.(Account_g)		3.03	1.033
Diğer matematik öğretmenlerinin öğretimlerini geliştirmek için onlara yardımcı olmamı.(Account_h)		2.57	1.082
Bir ders anlatmamı (veya kısa bir tanıtımı).(Account_i)		2.10	1.075
Desteğe ihtiyacı olan öğrencilerin, sınıftaki etkinliklere düzenli katılımlarını desteklememi.(Account_j)		3.09	.921
Matematik zümre başkanı ile belirli öğretim uygulamalarını çalışmamı.(Account_k)		3.01	1.018

APPENDIX G

ITEMS OF TPSA AND DESCRIPTIVE STATISTICS FOR USA

Table G1 Items of TPSA and Descriptive Statistics for USA

Items	**Coding**	**Mean**	***SD***
So far this school year, how often have the following events occurred?			
I discussed my teaching with this administrator (Feedback_a)	1 = never 2 = 1-2 times 3 = 3-5 times 4 = 6-10 times 5 = 11 – 20 6 = More than 20 times	3.37	1.282
This administrator observed my teaching (for at least 10 minutes) (Feedback_b)		3.29	1.129
This administrator provided me with feedback to improve my instruction after observing my teaching (Feedback_c)		3.04	1.168
This administrator reviewed my students work with me (Feedback_d)		1.98	1.134
This administrator provided feedback on introducing (or launching) a lesson (Feedback_e)		2.33	1.252
This administrator provided feedback on conducting a concluding whole-class discussion of students solutions (Feedback_f)		2.24	1.242
This administrator provided feedback on supporting students (e.g., through questioning) as they work in groups (Feedback_g)		2.46	1.229
So far this school year, how often has this administrator assisted you with the following?			
Identifying which math tasks or instructional activities to use (Assist_a)	1= Never 2 = Rarely 3 =Sometimes 4 = Often	1.93	.948
Introducing (or launching) a lesson (Assist_b)		1.75	.887
Understanding the mathematical goals for a given lesson (Assist_c)		1.91	.985

Table G1 (Continued)

Items		**Mean**	***SD***
Classroom management (Assist_d)		2.20	1.025
Grouping students in the classroom (Assist_e)		1.79	.907
Supporting students (e.g., questioning) as they work in groups (Assist_f)		1.95	.945
Supporting students to explain their own thinking (Assist_g)		1.97	.993
Supporting students to explain each other's thinking (Assist_h)		1.92	.972
Leading a concluding whole-class discussion of students solutions (Assist_i)		1.66	.887
Acquiring materials related to mathematics instruction (Assist_j)		2.00	.983
Matching the curriculum to the standards (Assist_k)		1.93	1.014
Analyzing data (Assist_l)		2.60	1.096
Supporting struggling students to participate in regular classroom activities (Assist_m)		2.03	.976
Regarding this administrator. to what extent do you agree or disagree with each of the following statements?			
The purpose of my school principal (or assistant principal) visiting my classroom is to directly assist me in improving my teaching (Trust_a)	1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree	3.76	.970
The purpose of my school principal (or assistant principal) visiting my classroom is to evaluate my teaching in terms of job performance (Trust_b)		4.08	.779
This administrator appreciates the challenges involved in using the curriculum effectively (Trust_c)		3.87	.892
When this administrator observes me teaching, s/he listens to what students say about mathematics (Trust_d)		4.12	.806
When this administrator observes me teaching, s/he pays attention to the mathematical tasks/instructional activities that students are working on (Trust_e)		4.14	.774
When this administrator observes me teaching, s/he listens to the kinds of questions that I ask (Trust_f)		4.20	.783
This administrator respects math teachers in this school (Trust_g)		4.15	.888
This administrator has confidence in the expertise of the math teachers (Trust_h)		4.06	.895

Table G1 (Continued)

Items		**Mean**	***SD***
I trust this administrator at his/her word (Trust_i)		3.95	1.025
I feel comfortable going to this administrator when I have questions or concerns (Trust_j)		3.94	1.059
This administrator can be counted on to follow through when a math teacher asks for assistance (Trust_k)		3.91	1.033
It's OK in this school to discuss feelings, worries, and frustrations with this administrator (Trust_l)		3.85	1.092
This administrator takes a personal interest in the professional development of math teachers (Trust_m)		3.91	1.018
This administrator is an effective manager who makes the school run smoothly (Trust_n)		3.80	1.126
To what extent do you agree or disagree that this administrator does the following?			
Makes clear to the staff his or her expectations for meeting instructional goals in mathematics (Leadership_a)	1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree	3.97	.933
Understands how children learn mathematics (Leadership_c)		3.69	1.001
Sets high standards for student learning in mathematics (Leadership_d)		3.89	.932
Presses mathematics teachers to implement what they have learned in professional development (Leadership_f)		3.90	.887
Carefully tracks student academic progress in mathematics (Leadership_g)		3.77	.982
Knows what's going on in my classroom (Leadership_h)		3.74	1.005
Communicates a clear vision for mathematics instruction (Leadership_i)		3.93	1.044
Participates in instructional planning with teams of mathematics teachers (Leadership_j)		3.40	1.229
To what extent does this administrator expect you to do the following things?			
Adhere to a prescribed pacing in my instruction (Account_a)	1 = not at all 2 = to a small extent 3 = to a moderate extent 4 = to a great extent	3.18	.775
Lead a concluding whole-class discussion of students solutions (Account_b)		2.99	.940
Support students (e.g., questioning) as they work in groups (Account_c)		3.33	.837
Observe other mathematics teachers instruction (Account_e)		2.49	1.055

Table G1 (Continued)

Items	**Mean**	***SD***
Use him/her/hem as a resource when instructional problems arise (Account_f)	2.54	1.010
Make my lesson plans available for review (Account_g)	3.26	.986
Assist other mathematics teachers in improving their instruction (Account_h)	2.83	.978
Introduce (or launch) a lesson (Account_i)	2.97	1.048
Support struggling students to participate in regular classroom activities (Account_j)	3.20	.886
Work with the math coach on improving specific instructional practices (e.g., launching tasks, questioning strategies, etc.) (Account_k)	2.75	1.080

APPENDIX H

TABLE OF SPECIFICATION (CONCEPTUAL FRAMEWORK) OF MIST TEACHER SURVEY

TPTO:

- Self-efficacy (Student engagement, instructional strategies, classroom management) (S13)
- Teacher-teacher respect (S14)
- Collective efficacy (positive collective efficacy and negative collective efficacy) (S15)
- Use of tools (S16)
- De-privatization (S17)
- Teacher- teacher Feedback (S18)
- Collaboration (Collaboration for instruction and Collaboration for student) (S29)

TPSA:

- Principal Feedback to teacher (S21)
- Principal Assist to Teacher (S22)
- Teacher trust in Principal (Teacher Trust in Principal and Principal Observation) (S23)
- Instructional Leadership (S24)
- Teacher Accountability to Principal (S25) (Teacher Accountable to Principal and Principal Account to teacher for Instruction)

APPENDIX I

MISSING VALUES ANALYSIS

Table I1 Missing Value Analysis for Turkey

TURKEY									
Item	**with missing values (raw data)**			**replace missing values with mean**			**replace missing values with "linear trend at a point"**		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
ClassMan_a	7.54	7	1.262	7.537	7	1.2572	7.537	7	1.2573
SSupport_b	6.46	7	1.393	6.463	7	1.3873	6.463	7	1.3873
ClassMan_c	7.18	7	1.339	7.176	7	1.3337	7.175	7	1.3338
SSupport_d	7.22	7	1.360	7.216	7	1.3525	7.215	7	1.3526
SSupport_e	7.71	8	1.189	7.712	8	1.1829	7.712	8	1.1829
ClassMan_f	7.56	8	1.165	7.561	8	1.1571	7.561	8	1.1571
SSupport_g	6.99	7	1.302	6.992	7	1.2920	6.992	7	1.2921
ClassMan_h	7.66	8	1.226	7.658	8	1.2174	7.657	8	1.2175
SSupport_i	6.60	7	1.520	6.599	7	1.5158	6.599	7	1.5159
SSupport_j	7.90	8	1.058	7.902	8	1.0583	7.902	8	1.0583
SSupport _k	6.35	7	1.671	6.347	7	1.6663	6.347	7	1.6663
SSupport_l	6.49	7	1.723	6.485	7	1.7234	6.485	7	1.7234
Respect_a	4.38	5	.773	4.375	5	.7700	4.375	5	.7700
Respect_b	4.51	5	.707	4.515	5	.7056	4.515	5	.7056

Table I1 (Continued)

Item	with missing values (raw data)			replace missing values with mean			replace missing values with "linear trend at a point"		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
Respect_c	4.39	5	.789	4.388	5	.7856	4.388	5	.7856
Respect_d	4.30	4	.852	4.300	4	.8500	4.300	4	.8501
Respect_e	4.41	5	.747	4.408	4	.7233	4.408	4	.7234
Respect_f	4.46	5	.722	4.463	5	.6977	4.463	5	.6978
PositiveCE_a	2.70	3	.972	2.696	3	.9455	2.694	3	.9456
PositiveCE_b	3.07	3	1.058	3.073	3	1.0237	3.072	3	1.0237
PositiveCE_c	4.14	4	.767	4.140	4	.7435	4.140	4	.7436
PositiveCE_d	3.23	3	1.119	3.226	3	1.0870	3.226	3	1.0871
PositiveCE_e	3.21	3	1.042	3.213	3	1.0102	3.211	3	1.0103
PositiveCE_f	3.94	4	.800	3.938	4	.7743	3.937	4	.7744
NegativeCE_g	4.07	4	1.055	4.070	4	1.0226	4.070	4	1.0226
NegativeCE_h	3.94	4	.951	3.941	4	.9226	3.940	4	.9226
NegativeCE_i	4.27	4	.791	4.274	4	.7684	4.274	4	.7684
PositiveCE_j	3.82	4	.857	3.824	4	.8324	3.822	4	.8325
NegativeCE_k	4.39	5	.759	4.394	4	.7373	4.395	4	.7373
Tools_a	3.50	4	1.199	3.499	3	1.1406	3.499	4	1.1406
Tools_b	3.15	3	1.278	3.145	3	1.1552	3.146	3	1.1553
Deprivati_a	4.08	4	.858	4.081	4	.8336	4.082	4	.8336
Deprivati_c	4.14	4	.763	4.140	4	.7400	4.140	4	.7400
Deprivati_d	4.14	4	.750	4.140	4	.7292	4.140	4	.7292
Deprivati_e	3.81	4	.907	3.809	4	.8732	3.810	4	.8732
T_Feedback_a	1.37	1	.811	1.366	1	.8039	1.365	1	.8039
T_Feedback_b	1.34	1	.800	1.337	1	.7916	1.337	1	.7916
T_Feedback_c	1.28	1	.676	1.277	1	.6661	1.277	1	.6662
Feedback_a	1.76	1	1.012	1.756	2	.9643	1.756	2	.9643

Table I1 (Continued)

Item	with missing values (raw data)			replace missing values with mean			replace missing values with "linear trend at a point"		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
Feedback_b	1.45	1	.765	1.454	1	.7306	1.452	1	.7311
Feedback_c	1.31	1	.652	1.315	1	.6143	1.314	1	.6146
Feedback_d	1.53	1	.843	1.528	1	.7976	1.527	1	.7979
Feedback_e	1.38	1	.863	1.381	1	.8120	1.380	1	.8124
Feedback_f	1.38	1	.805	1.381	1	.7581	1.380	1	.7587
Feedback_g	1.37	1	.768	1.373	1	.7256	1.372	1	.7259
Assist_a	1.86	1	1.026	1.861	2	.9684	1.860	2	.9685
Assist_b	1.43	1	.801	1.432	1	.7585	1.431	1	.7587
Assist_c	1.49	1	.823	1.488	1	.7774	1.488	1	.7774
Assist_d	1.85	2	.988	1.845	2	.9383	1.845	2	.9383
Assist_e	1.39	1	.761	1.395	1	.7173	1.395	1	.7174
Assist_f	1.49	1	.822	1.485	1	.7782	1.485	1	.7782
Assist_g	1.84	1	1.021	1.836	2	.9595	1.836	2	.9595
Assist_h	1.88	1	1.043	1.877	2	.9786	1.878	2	.9787
Assist_i	1.99	2	1.076	1.991	2	1.0118	1.991	2	1.0119
Assist_j	2.40	2	1.160	2.395	2	1.0972	2.396	2	1.0972
Assist_k	1.95	1	1.115	1.949	2	1.0492	1.949	2	1.0493
Assist_l	2.06	2	1.156	2.059	2	1.0896	2.060	2	1.0899
Assist_m	2.12	2	1.150	2.121	2	1.0863	2.122	2	1.0864
Trust_a	3.28	4	1.306	3.275	3	1.1994	3.272	3	1.1998
Trust _b	3.56	4	1.117	3.561	4	1.0243	3.562	4	1.0243
Trust _c	3.49	4	1.047	3.494	3	.9588	3.494	4	.9588
Trust_d	3.58	4	1.056	3.579	4	.9671	3.577	4	.9672
Trust_e	3.45	4	1.119	3.450	3	1.0244	3.445	4	1.0251
Trust_f	3.04	3	1.158	3.038	3	1.0535	3.038	3	1.0535
Trust_g	4.22	4	.910	4.219	4	.8529	4.221	4	.8533

Table I1 (Continued)

Item	with missing values (raw data)			replace missing values with mean			replace missing values with "linear trend at a point"		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
Trust_h	4.16	4	.896	4.157	4	.8386	4.158	4	.8387
Trust_i	4.10	4	.956	4.102	4	.8946	4.103	4	.8947
Trust_j	4.06	4	1.066	4.060	4	.9957	4.061	4	.9958
Trust_k	3.92	4	1.047	3.918	4	.9770	3.918	4	.9770
Trust_l	3.86	4	1.070	3.864	4	1.0012	3.865	4	1.0012
Trust_m	3.54	4	1.145	3.541	4	1.0662	3.540	4	1.0663
Trust_n	3.93	4	1.064	3.931	4	.9939	3.931	4	.9939
Leadership_a	3.72	4	.950	3.718	4	.8901	3.717	4	.8902
Leadership_c	3.29	3	1.047	3.294	3	.9766	3.294	3	.9766
Leadership_d	3.18	3	1.100	3.180	3	1.0214	3.180	3	1.0214
Leadership_f	2.48	2	.961	2.476	2	.8935	2.475	2	.8938
Leadership_g	3.47	4	1.070	3.467	4	1.0041	3.467	4	1.0041
Leadership_h	3.30	3	1.098	3.295	3	1.0275	3.295	3	1.0275
Leadership_i	3.70	4	.971	3.696	4	.9089	3.696	4	.9089
Leadership_j	3.52	4	1.088	3.520	4	1.0166	3.521	4	1.0174
Account_a	3.49	4	.792	3.490	4	.7448	3.489	4	.7449
Account_b	3.35	4	.901	3.348	3	.8403	3.348	3	.8403
Account_c	3.03	3	1.020	3.033	3	.9548	3.033	3	.9548
Account_e	2.59	3	1.197	2.587	3	1.1118	2.587	3	1.1120
Account_f	2.58	3	1.121	2.584	3	1.0439	2.582	3	1.0444
Account_g	3.03	3	1.075	3.027	3	1.0063	3.025	3	1.0069
Account_h	2.57	3	1.135	2.569	3	1.0543	2.569	3	1.0544
Account_i	2.10	2	1.139	2.100	2	1.0476	2.098	2	1.0490
Account_j	3.09	3	.969	3.089	3	.8974	3.089	3	.8976
Account_k	3.01	3	1.071	3.012	3	.9920	3.012	3	.9920
CollaStudent_a	.79	1	.410	.787	1	.3977	.786	1	.3977

Table I1 (Continued)

Item	with missing values (raw data)			replace missing values with mean			replace missing values with "linear trend at a point"		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
CollaStudent_b	.28	0	.449	.278	0	.4348	.278	0	.4349
CollaStudent_c	.69	1	.464	.688	1	.4495	.688	1	.4496
CollaStudent_d	.69	1	.464	.688	1	.4495	.688	1	.4495
CollaStudent_e	.25	0	.435	.253	0	.4218	.253	0	.4218
CollaInst_f	.47	0	.500	.466	0	.4841	.467	0	.4842
CollaInst_g	.59	1	.493	.587	1	.4778	.587	1	.4778
CollaInst_h	.51	1	.501	.511	1	.4851	.511	1	.4851

Table I2 Missing Value Analysis for USA

USA									
Item	with missing values (raw data)			replace missing values with mean			replace missing values with "linear trend at a point"		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
ClassMan_a	7.03	7	1.598	7.029	7	1.5848	7.025	7	1.5852
SSupport_b	5.93	6	1.460	5.929	6	1.4483	5.927	6	1.4486
ClassMan_c	6.77	7	1.456	6.768	7	1.4443	6.766	7	1.4444
SSupport_d	6.37	7	1.533	6.367	7	1.5173	6.365	7	1.5174
SSupport_e	7.06	7	1.340	7.059	7	1.3232	7.055	7	1.3234
ClassMan_f	7.18	8	1.482	7.176	8	1.4635	7.172	8	1.4641
SSupport_g	6.62	7	1.372	6.622	7	1.3519	6.619	7	1.3524
ClassMan_h	7.33	8	1.340	7.328	8	1.3292	7.326	8	1.3294
SSupport_i	7.11	7	1.538	7.109	7	1.5192	7.109	7	1.5192
SSupport_j	7.59	8	1.222	7.585	8	1.2121	7.583	8	1.2123
SSupport _k	6.04	6	1.817	6.038	6	1.7978	6.038	6	1.7978
SSupport_l	6.71	7	1.601	6.714	7	1.5879	6.712	7	1.5880

Table I2 (Continued)

Item	with missing values (raw data)			replace missing values with mean			replace missing values with "linear trend at a point"		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
Respect_a	3.98	4	.886	3.984	4	.8823	3.984	4	.8823
Respect_b	4.11	4	.830	4.112	4	.8248	4.112	4	.8250
Respect_c	3.98	4	.886	3.984	4	.8823	3.985	4	.8825
Respect_d	3.90	4	.950	3.896	4	.9418	3.896	4	.9422
Respect_e	3.93	4	.851	3.926	4	.8461	3.926	4	.8462
Respect_f	4.01	4	.850	4.008	4	.8396	4.008	4	.8399
PositiveCE_a	2.78	3	.965	2.780	3	.9567	2.780	3	.9567
PositiveCE_b	2.98	3	.966	2.979	3	.9558	2.979	3	.9558
PositiveCE_c	3.38	4	.840	3.379	4	.8310	3.379	4	.8311
PositiveCE_d	3.02	3	.930	3.021	3	.9164	3.021	3	.9164
PositiveCE_e	2.16	2	.934	2.163	2	.9248	2.163	2	.9248
PositiveCE_f	3.35	4	.792	3.349	4	.7859	3.348	4	.7861
NegativeCE_g	3.79	4	.860	3.793	4	.8532	3.793	4	.8532
NegativeCE_h	3.98	4	.869	3.983	4	.8587	3.982	4	.8595
NegativeCE_i	3.85	4	.773	3.846	4	.7664	3.846	4	.7664
PositiveCE_j	3.87	4	.748	3.867	4	.7403	3.867	4	.7405
NegativeCE_k	3.98	4	.851	3.983	4	.8443	3.983	4	.8445
Tools_a	2.92	3	1.175	2.921	3	1.1656	2.921	3	1.1656
Tools_b	2.73	3	1.210	2.727	3	1.1930	2.727	3	1.1930
Deprivati_a	3.99	4	.979	3.992	4	.9751	3.994	4	.9753
Deprivati_c	3.95	4	.868	3.955	4	.8648	3.956	4	.8650
Deprivati_d	3.52	4	1.046	3.519	4	1.0415	3.519	4	1.0415
Deprivati_e	3.71	4	.733	3.715	4	.7280	3.715	4	.7280
T_Feedback_a	2.26	2	1.207	2.264	2	1.1995	2.265	2	1.1996
T_Feedback_b	2.07	2	1.137	2.074	2	1.1320	2.076	2	1.1321
T_Feedback_c	2.02	2	.995	2.016	2	.8800	2.018	2	.8820
Feedback_a	3.37	3	1.282	3.368	3	1.2744	3.367	3	1.2744

Table I2 (Continued)

Item	with missing values (raw data)			replace missing values with mean			replace missing values with "linear trend at a point"		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
Feedback_b	3.29	3	1.129	3.285	3	1.1223	3.287	3	1.1224
Feedback_c	3.04	3	1.168	3.037	3	1.1606	3.037	3	1.1606
Feedback_d	1.98	2	1.139	1.983	2	1.1270	1.984	2	1.1271
Feedback_e	2.33	2	1.252	2.335	2	1.2445	2.336	2	1.2445
Feedback_f	2.24	2	1.247	2.238	2	1.2339	2.237	2	1.2339
Feedback_g	2.46	2	1.229	2.463	2	1.2217	2.463	2	1.2217
Assist_a	1.93	2	.950	1.925	2	.9423	1.926	2	.9423
Assist_b	1.75	1	.889	1.747	1	.8814	1.747	1	.8814
Assist_c	1.91	2	.989	1.908	2	.9793	1.909	2	.9793
Assist_d	2.20	2	1.027	2.203	2	1.0184	2.204	2	1.0184
Assist_e	1.79	2	.909	1.788	2	.9013	1.788	2	.9013
Assist_f	1.95	2	.947	1.950	2	.9396	1.950	2	.9396
Assist_g	1.97	2	.995	1.967	2	.9871	1.966	2	.9871
Assist_h	1.92	2	.976	1.921	2	.9656	1.920	2	.9657
Assist_i	1.66	1	.889	1.664	1	.8819	1.664	1	.8819
Assist_j	2.00	2	.985	1.996	2	.9772	1.995	2	.9772
Assist_k	1.93	2	1.016	1.929	2	1.0078	1.930	2	1.0078
Assist_l	2.60	3	1.102	2.603	3	1.0888	2.603	3	1.0888
Assist_m	2.03	2	.978	2.033	2	.9703	2.033	2	.9703
Trust_a	3.76	4	.972	3.755	4	.9636	3.756	4	.9637
Trust _b	4.08	4	.781	4.083	4	.7744	4.084	4	.7745
Trust _c	3.87	4	.898	3.866	4	.8864	3.866	4	.8864
Trust_d	4.12	4	.810	4.117	4	.8015	4.117	4	.8015
Trust_e	4.14	4	.776	4.137	4	.7695	4.137	4	.7695
Trust_f	4.20	4	.788	4.197	4	.7782	4.197	4	.7782
Trust_g	4.15	4	.891	4.146	4	.8822	4.146	4	.8822

Table I2 (Continued)

Item	with missing values (raw data)			replace missing values with mean			replace missing values with "linear trend at a point"		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
Trust_h	4.06	4	.899	4.058	4	.8898	4.058	4	.8898
Trust_i	3.95	4	1.028	3.950	4	1.0191	3.950	4	1.0191
Trust_j	3.94	4	1.061	3.938	4	1.0521	3.937	4	1.0522
Trust_k	3.91	4	1.037	3.913	4	1.0266	3.912	4	1.0266
Trust_l	3.85	4	1.094	3.846	4	1.0851	3.846	4	1.0851
Trust_m	3.91	4	1.021	3.909	4	1.0122	3.909	4	1.0122
Trust_n	3.80	4	1.136	3.803	4	1.1194	3.802	4	1.1194
Leadership_a	3.97	4	.937	3.967	4	.9271	3.966	4	.9272
Leadership_c	3.69	4	1.007	3.686	4	.9948	3.686	4	.9948
Leadership_d	3.89	4	.936	3.892	4	.9259	3.892	4	.9259
Leadership_f	3.90	4	.893	3.900	4	.8815	3.900	4	.8815
Leadership_g	3.77	4	.986	3.771	4	.9759	3.769	4	.9763
Leadership_h	3.74	4	1.013	3.744	4	.9987	3.742	4	.9988
Leadership_i	3.93	4	1.053	3.933	4	1.0381	3.933	4	1.0381
Leadership_j	3.40	4	1.234	3.404	4	1.2211	3.404	4	1.2211
Account_a	3.18	3	.778	3.175	3	.7700	3.175	3	.7700
Account_b	2.99	3	.942	2.988	3	.9342	2.987	3	.9343
Account_c	3.33	4	.840	3.325	4	.8314	3.325	4	.8314
Account_e	2.49	3	1.057	2.485	2	1.0484	2.486	3	1.0484
Account_f	2.54	3	1.012	2.544	3	1.0037	2.544	3	1.0037
Account_g	3.26	4	.989	3.261	4	.9804	3.262	4	.9805
Account_h	2.83	3	.980	2.826	3	.9723	2.826	3	.9723
Account_i	2.97	3	1.053	2.971	3	1.0417	2.971	3	1.0418
Account_j	3.20	3	.889	3.204	3	.8801	3.205	3	.8802
Account_k	2.75	3	1.082	2.751	3	1.0733	2.751	3	1.0733
CollaStudent_a	.90	1	.302	.899	1	.2973	.898	1	.2974

Table I2 (Continued)

Item	**with missing values (raw data)**			**replace missing values with mean**			**replace missing values with "linear trend at a point"**		
	M	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*	*M*	$\tilde{x}$	*SD*
CollaStudent_b	.63	1	.485	.627	1	.4756	.627	1	.4756
CollaStudent_c	.75	1	.436	.747	1	.4285	.747	1	.4286
CollaStudent_d	.37	0	.484	.371	0	.4762	.372	0	.4762
CollaStudent_e	.42	0	.495	.419	0	.4853	.420	0	.4853
CollaInst_f	.57	1	.497	.565	1	.4885	.566	1	.4886
CollaInst_g	.56	1	.498	.557	1	.4896	.557	1	.4896
CollaInst_h	.39	0	.490	.394	0	.4806	.393	0	.4806

APPENDIX J

ITC GUIDELINES FOR TRANSLATING AND ADAPTING TESTS

(Retrieved from http://www.intestcom.org/files/guideline_test_adaptation.pdf at 23/03/2015)

The Guidelines

Context Guidelines

C.1 Effects of cultural differences which are not relevant or important to the main purposes of the study should be minimized to the extent possible.

C.2 The amount of overlap in the construct measured by the test or instrument in the populations of interest should be assessed.

Test Development and Adaptation Guidelines

D.1 Test developers/publishers should insure that the adaptation process takes full account of linguistic and cultural differences among the populations for whom adapted versions of the test or instrument are intended.

D.2 Test developers/publishers should provide evidence that the language use in the directions. rubrics. and items themselves as well as in the handbook are appropriate for all cultural and language populations for whom the test or instrument is intended.

D.3 Test developers/publishers should provide evidence that the choice of testing techniques. item formats. test conventions. and procedures are familiar to all intended populations.

D.4 Test developers/publishers should provide evidence that item content and stimulus materials are familiar to all intended populations.

D.5 Test developers/publishers should implement systematic judgmental evidence. Both linguistic and psychological to improve the accuracy of the adaptation process and compile evidence on the equivalence of all language versions.
D.6 Test developers/publishers should ensure that the data collection design permits the use of appropriate statistical techniques to establish item equivalence between the different language versions of the test or instrument.
D.7 Test developers/publishers should apply appropriate statistical techniques to (1) establish the equivalence of the different versions of the test or instrument. and (2) identify problematic components or aspects of the test or instrument which may be inadequate to one or more of the intended populations.
D.8 Test developers/publishers should provide information on the evaluation of validity in all target populations for whom the adapted versions are intended.
D.9 Test developers/publishers should provide statistical evidence of the equivalence of questions for all intended populations.
D.10 Non-equivalent questions between versions intended for different populations should not be used in preparing a common scale or in comparing these populations. However, they may be useful in enhancing content validity of scores reported for each population separately.

Administration Guidelines

A.1 Test developers and administrators should try to anticipate the types of problems that can be expected, and take appropriate actions to remedy these problems through the preparation of appropriate materials and instructions.
A.2 Test administrators should be sensitive to a number of factors related to the stimulus materials. Administration procedures and response modes that can moderate the validity of the inferences drawn from the scores.
A.3 Those aspects of the environment that influence the administration of a test or instrument should be made as similar as possible across populations of interest.
A.4 Test administration instructions should be in the source and target languages to minimize the influence of unwanted sources of variation across populations.
A.5 The test manual should specify all aspects of the administration that require scrutiny in a new cultural context.

A.6 The administrator should be unobtrusive and the administrator-examinee interaction should be minimized. Explicit rules that are described in the manual for administration should be followed.

Documentation/Score Interpretation Guidelines

I.1 When a test or instrument is adapted for use in another population. documentation of the changes should be provided. along with evidence of the equivalence.

I.2 Score differences among samples of populations administered the test or instrument should not be taken at f ace value. The researcher has the responsibility to substantiate the differences with other empirical evidence.

I.3 Comparisons across populations can only be made at the level of invariance that has been established for the scale on which scores are reported.

I.4 The test developer should provide specific information on the ways in which the socio-cultural and ecological contexts of the populations might affect performance. and should suggest procedures to account for these effects in the interpretation of results.

APPENDIX K

POINT BISERIAL CORRELATION COEFFICIENTS AND z-TESTS OF TURKISH AND AMERICAN TEACHERS' DIFFERENCES USING FISHER'S r-to-z TRANSFORM

Table K1

Item	Mean TR	Mean USA	r_{tr}	r_{usa}	z_{rt} (Fisher z for TR r)	z_{rusa} (Fisher z for USA r)	Z_d (z_tr-z_usa/ s_zr)
ClassMan_a	7.537	7.029	.224	.295	0.228	0.304	-0.739
SSupport_b	6.463	5.929	.474	.455	0.515	0.491	0.233
ClassMan_c	7.176	6.768	.238	.325	0.243	0.337	-0.919
SSupport_d	7.216	6.367	.385	.507	0.406	0.559	-1.483
SSupport_e	7.712	7.059	.310	.253	0.320	0.259	0.598
ClassMan_f	7.561	7.176	.353	.318	0.369	0.329	0.388
SSupport_g	6.992	6.622	.453	.472	0.488	0.512	-0.237
ClassMan_h	7.658	7.328	.372	.328	0.391	0.341	0.491
SSupport_i	6.599	7.109	.390	.408	0.412	0.433	-0.210
SSupport_j	7.902	7.585	.244	.327	0.249	0.339	-0.874
SSupport _k	6.347	6.038	.449	.362	0.483	0.379	1.015
SSupport_l	6.485	6.714	.427	.376	0.456	0.396	0.585
Respect_a	4.375	3.984	.393	.321	0.416	0.333	0.807
Respect_b	4.515	4.112	.316	.293	0.327	0.302	0.250
Respect_c	4.388	3.984	.416	.336	0.443	0.350	0.904

Table K1 (Continued)

Respect_d	4.300	3.896	.311	.233	0.321	0.238	0.816
Respect_e	4.408	3.926	.408	.337	0.434	0.350	0.812
Respect_f	4.463	4.008	.383	.298	0.404	0.307	0.942
PositiveCE_a	2.696	2.780	.386	.338	0.407	0.351	0.547
PositiveCE_b	3.073	2.979	.358	.323	0.375	0.335	0.393
PositiveCE_c	4.140	3.379	.394	.471	0.416	0.512	-0.933
PositiveCE_d	3.226	3.021	.337	.303	0.351	0.313	0.373
PositiveCE_e	3.213	2.163	.339	.124	0.353	0.125	2.223*
PositiveCE_f	3.938	3.349	.334	.393	0.347	0.416	-0.668
NegativeCE_g	4.070	3.793	.086	.195	0.086	0.198	-1.093
NegativeCE_h	3.941	3.983	.361	.332	0.377	0.345	0.319
NegativeCE_i	4.274	3.846	.333	.466	0.346	0.506	-1.554
PositiveCE_j	3.824	3.867	.362	.400	0.379	0.424	-0.441
NegativeCE_k	4.394	3.983	.342	.257	0.357	0.263	0.913
Tools_a	3.499	2.921	.126	.186	0.126	0.188	-0.602
Tools_b	3.145	2.727	.153	.223	0.154	0.227	-0.708
Deprivati_a	4.081	3.992	.408	.255	0.434	0.261	1.680
Deprivati_c	4.140	3.955	.433	.376	0.463	0.395	0.663
Deprivati_d	4.140	3.519	.498	.331	0.546	0.344	1.974*
Deprivati_e	3.809	3.715	.316	.254	0.327	0.259	0.662
T_Feedback_a	1.366	2.264	.181	.156	0.183	0.158	0.243
T_Feedback_b	1.337	2.074	.156	.075	0.158	0.075	0.807
T_Feedback_c	1.277	2.016	.208	.105	0.211	0.105	1.028
Feedback_a	1.756	3.368	.357	.437	0.373	0.469	-0.936
Feedback_b	1.454	3.285	.366	.412	0.384	0.438	-0.522
Feedback_c	1.315	3.037	.405	.524	0.430	0.582	-1.479
Feedback_d	1.528	1.983	.490	.498	0.535	0.547	-0.108
Feedback_e	1.381	2.335	.395	.540	0.417	0.605	-1.827
Feedback_f	1.381	2.238	.435	.562	0.466	0.636	-1.657
Feedback_g	1.373	2.463	.464	.597	0.502	0.689	-1.825
Assist_a	1.861	1.925	.511	.466	0.564	0.505	0.584
Assist_b	1.432	1.747	.425	.466	0.454	0.505	-0.496
Assist_c	1.488	1.908	.457	.511	0.494	0.564	-0.685
Assist_d	1.845	2.203	.416	.302	0.443	0.311	1.280
Assist_e	1.395	1.788	.421	.464	0.449	0.503	-0.520
Assist_f	1.485	1.950	.487	.548	0.532	0.615	-0.808
Assist_g	1.836	1.967	.515	.544	0.570	0.609	-0.382

Table K1 (Continued)

Assist_h	1.877	1.921	.475	.564	0.517	0.638	-1.180
Assist_i	1.991	1.664	.443	.471	0.477	0.511	-0.334
Assist_j	2.395	1.996	.430	.421	0.460	0.449	0.111
Assist_k	1.949	1.929	.531	.493	0.592	0.540	0.508
Assist_l	2.059	2.603	.542	.487	0.607	0.533	0.725
Assist_m	2.121	2.033	.599	.565	0.692	0.641	0.495
Trust_a	3.275	3.755	.509	.593	0.561	0.682	-1.177
Trust _b	3.561	4.083	.307	.202	0.317	0.205	1.093
Trust _c	3.494	3.866	.547	.642	0.614	0.762	-1.440
Trust_d	3.579	4.117	.594	.578	0.684	0.659	0.246
Trust_e	3.450	4.137	.634	.606	0.748	0.702	0.449
Trust_f	3.038	4.197	.427	.613	0.456	0.714	-2.520*
Trust_g	4.219	4.146	.545	.580	0.612	0.663	-0.500
Trust_h	4.157	4.058	.558	.608	0.630	0.706	-0.740
Trust_i	4.102	3.950	.561	.655	0.635	0.783	-1.451
Trust_j	4.060	3.938	.582	.691	0.666	0.850	-1.799
Trust_k	3.918	3.913	.613	.702	0.714	0.871	-1.532
Trust_l	3.864	3.846	.551	.645	0.620	0.766	-1.427
Trust_m	3.541	3.909	.653	.700	0.781	0.868	-0.846
Trust_n	3.931	3.803	.617	.647	0.720	0.770	-0.482
Leadership_a	3.718	3.967	.609	.749	0.707	0.970	-2.567**
Leadership_c	3.294	3.686	.639	.741	0.757	0.952	-1.901
Leadership_d	3.180	3.892	.577	.706	0.658	0.878	-2.145
Leadership_f	2.476	3.900	.252	.639	0.257	0.756	-4.859**
Leadership_g	3.467	3.771	.605	.625	0.700	0.734	-0.327
Leadership_h	3.295	3.744	.614	.741	0.715	0.952	-2.315*
Leadership_i	3.696	3.933	.660	.674	0.792	0.818	-0.247
Leadership_j	3.520	3.404	.532	.630	0.593	0.742	-1.447
Account_a	3.490	3.175	.323	.346	0.335	0.361	-0.252
Account_b	3.348	2.988	.480	.449	0.523	0.483	0.387
Account_c	3.033	3.325	.563	.454	0.637	0.490	1.431
Account_e	2.587	2.485	.399	.517	0.422	0.573	-1.463
Account_f	2.584	2.544	.458	.640	0.495	0.759	-2.574**
Account_g	3.027	3.261	.312	.365	0.322	0.382	-0.587
Account_h	2.569	2.826	.418	.563	0.445	0.638	-1.879
Account_i	2.100	2.971	.390	.360	0.412	0.377	0.339
Account_j	3.089	3.204	.573	.473	0.653	0.514	1.356

Table K1 (Continued)

Account_k	3.012	2.751	.489	.464	0.535	0.502	0.321
CollaStudent_a	.787	.899	.240	.168	0.245	0.170	0.730
CollaStudent_b	.278	.627	.183	.288	0.185	0.296	-1.083
CollaStudent_c	.688	.747	.118	.230	0.118	0.234	-1.134
CollaStudent_d	.688	.371	.051	.140	0.051	0.141	-0.878
CollaStudent_e	.253	.419	.098	.280	0.098	0.288	-1.851
CollaInst_f	.466	.565	.099	.280	0.100	0.288	-1.839
CollaInst_g	.587	.557	.092	.312	0.092	0.323	-2.245*
CollaInst_h	.511	.394	.210	.339	0.213	0.353	-1.361

Table K2

Item	**Mean TR**	**Mean USA**	**r_{tr}**	**r_{usa}**	**z_{rt} (Fisher z for TR r)**	**z_{rusa} (Fisher z for USA r)**	**Z_d (z_tr-z_usa/ s_zr)**
PositiveCE_e	3.213	2.163	.339	.124	0.353	0.125	2.223**
Deprivati_d	4.140	3.519	.498	.331	0.546	0.344	1.974*
Trust_f	3.038	4.197	.427	.613	0.456	0.714	-2.520*
Leadership_a	3.718	3.967	.609	.749	0.707	0.970	-2.567**
Leadership_f	2.476	3.900	.252	.639	0.257	0.756	-4.859**
Leadership_h	3.295	3.744	.614	.741	0.715	0.952	-2.315*
Account_f	2.584	2.544	.458	.640	0.495	0.759	-2.574**
CollaInst_g	.587	.557	.092	.312	0.092	0.323	-2.245*

*p<.05. two tailed test z_{crit} = +-1.960
**p<.01. two tailed test z_{crit} = +-2.575

Table K3

Item	**Mean TR**	**Mean USA**	**r_{tr}**	**r_{usa}**	**z_{rt} (Fisher z for TR r)**	**z_{rusa} (Fisher z for USA r)**	**Z_d (z_tr-z_usa/ s_zr)**
PositiveCE_e	3.213	2.163	.339	.124	0.353	0.125	2.223**
Leadership_a	3.718	3.967	.609	.749	0.707	0.970	-2.567**
Leadership_f	2.476	3.900	.252	.639	0.257	0.756	-4.859**
Account_f	2.584	2.544	.458	.640	0.495	0.759	-2.574**

*p<.05. two tailed test z_{crit} = +-1.960
**p<.01. two tailed test z_{crit} = +-2.575

APPENDIX L

MIST TEACHER SURVEY

Mathematics and the Institutional Setting of Teaching
Vanderbilt University

FWISD Teacher Survey

Welcome to the Vanderbilt University Study of Middle School Mathematics and the Institutional Setting of Teaching (MIST) Survey!

This survey will take approximately 45 minutes to complete. For each of the following questions. unless otherwise directed. please mark the one answer that best describes your experiences as a teacher during the current school year (including last summer). Please answer every question unless directed otherwise.

1) How many math courses do you teach this year?	1	2	3	4	5	6	7	8
	◯	◯	◯	◯	◯	◯	◯	◯

2) What grade levels do you teach this year? (Check all that apply)	6th	7th	8th
	◯	◯	◯

3) What course levels do you teach this year? (Check all that apply)	Regular/ Comprehensive	Inclusion	Sheltered	Honors / AP	Algebra / Pre-Algebra	Double Dose / Support	Other
	◯	◯	◯	◯	◯	◯	_____

4) This set of questions is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinions about each of the statements below by selecting the appropriate number.

a. To what extent can you control disruptive behavior in your mathematics classroom?

1 2 3 4 5 6 7 8 9
Not at all Very Little Somewhat Quite A Bit A Great Deal

b. To what extent can you motivate students who show low interest in mathematics?

1 2 3 4 5 6 7 8 9
Not at all Very Little Somewhat Quite A Bit A Great Deal

c. To what extent can you calm a student who is disruptive or noisy in your mathematics classroom?

1 2 3 4 5 6 7 8 9
Not at all Very Little Somewhat Quite A Bit A Great Deal

d. To what extent can you help your students value learning mathematics?

1	2	3	4	5	6	7	8	9
Not at all		Very Little		Somewhat		Quite A Bit		A Great Deal

e. To what extent can you craft good questions for your students related to mathematics?

1	2	3	4	5	6	7	8	9
Not at all		Very Little		Somewhat		Quite A Bit		A Great Deal

f. To what extent can you get students to follow classroom rules?

1	2	3	4	5	6	7	8	9
Not at all		Very Little		Somewhat		Quite A Bit		A Great Deal

g. To what extent can you get students to believe they can do well in mathematics?

1	2	3	4	5	6	7	8	9
Not at all		Very Little		Somewhat		Quite A Bit		A Great Deal

h. How well can you establish a classroom management system in classes you teach?

1	2	3	4	5	6	7	8	9
Not at all		Very Little		Somewhat		Quite A Bit		A Great Deal

i. To what extent can you use a variety of assessment strategies in your mathematics teaching?

1	2	3	4	5	6	7	8	9
Not at all		Very Little		Somewhat		Quite A Bit		A Great Deal

j. To what extent can you provide an alternative explanation or example when students are confused?

1	2	3	4	5	6	7	8	9

Not at all	Very Little	Somewhat	Quite A Bit	A Great Deal

k. How well can you assist families in helping their children do well in mathematics?

1	2	3	4	5	6	7	8	9
Not at all		Very Little		Somewhat		Quite A Bit		A Great Deal

l. How much can you do to adjust your lessons to the proper level for individual students?

1	2	3	4	5	6	7	8	9
Not at all		Very Little		Somewhat		Quite A Bit		A Great Deal

The following questions pertain to ALL MATHEMATICS TEACHERS at your school.

5) To what extent do you agree or disagree with the following statements.	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
a. Math teachers in this school really care about each other.	○	○	○	○	○
b. Math teachers in this school respect each other.	○	○	○	○	○
c. Math teachers in this school trust each other.	○	○	○	○	○
d. It's OK in this school to discuss feelings. worries. and frustrations with other math teachers.	○	○	○	○	○
e. Math teachers respect other teachers who take the lead in school improvement efforts.	○	○	○	○	○
f. Math teachers at this school respect those colleagues who are expert at their craft.	○	○	○	○	○

6) To what extent do you agree or disagree with the following statements:	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**

a. Our students come to school ready to learn.	◯	◯	◯	◯	◯
b. The opportunities in this community help to ensure that our students will learn.	◯	◯	◯	◯	◯
c. Math teachers here are confident they will be able to motivate their students.	◯	◯	◯	◯	◯
d. Students here just aren't motivated to learn.	◯	◯	◯	◯	◯
e. Home life provides so many advantages the students here are bound to learn.	◯	◯	◯	◯	◯
f. Drug and alcohol abuse in the community make learning difficult for students here.	◯	◯	◯	◯	◯
g. Math teachers in this school are able to get through to difficult students.	◯	◯	◯	◯	◯
h. Learning is more difficult at this school because students are worried about their safety.	◯	◯	◯	◯	◯
i. If a child doesn't want to learn. mathematics teachers here give up on him or her.	◯	◯	◯	◯	◯
j. Math teachers in this school do not have the skills to deal with student disciplinary problems.	◯	◯	◯	◯	◯
k. Math teachers in this school really believe every child can learn.	◯	◯	◯	◯	◯
l. Math teachers here don't have the skills needed to produce meaningful student learning.	◯	◯	◯	◯	◯

7) In a typical school week, how often do you use the following when planning instruction?	**Never**	**1-2 times**	**3-5 times**	**6-10 times**	**More than 10 times**
a. CMP2 Textbook (Ders kitabı)	◯	◯	◯	◯	◯
b. CMP2 Teacher's Manual (Öğrenci Çalışma Kitabı)	◯	◯	◯	◯	◯
c. Curriculum Frameworks (Müfredat)	◯	◯	◯	◯	◯
d. Curriculum-Based Assessments (CBAs) (Yardımcı kitaplar)	◯	◯	◯	◯	◯

The next few questions pertain to your interactions with other MATHEMATICS teachers.

8) Now consider conditions of mathematics teaching. How well does each of the following statements describe conditions in your school?	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
a. Math teachers in this school regularly share ideas about mathematics instruction.	◯	◯	◯	◯	◯
b. There is a lot of disagreement among teachers about how to teach mathematics.	◯	◯	◯	◯	◯
c. I feel supported by other teachers to try out new ideas in teaching mathematics.	◯	◯	◯	◯	◯
d. Math teachers at this school make a conscious effort to coordinate their teaching with instruction at other grade levels.	◯	◯	◯	◯	◯
e. Math teachers are willing to question one another's views.	◯	◯	◯	◯	◯

9) So far this school year how often have the following events occurred?	**Never**	**1-2 times**	**3-5 times**	**6-10 times**	**More than 10 times**
a. A mathematics teacher (other than an LCT) observed my teaching (for at least 10 minutes).	◯	◯	◯	◯	◯
b. I observed a mathematics teacher (other than an LCT) teach in a classroom (for at least 10 minutes).	◯	◯	◯	◯	◯
c. I received feedback from other math teachers (other than an LCT) after they observed my teaching.	◯	◯	◯	◯	◯

If you selected "Never" for question 9c. please skip to question 11.

10) To what extent has post-observation feedback from other math teachers (other than an LCT) impacted your instruction?	**Not at all**	**To a small extent**	**To a moderate extent**	**To a great extent**
	◯	◯	◯	◯

11) What is the name of the mathematics coach (e.g.. LCT. Algebra Readiness Coach) with whom you work with the most often on matters of math instruction?	_____

For the following questions. we will refer to the person you identified in question 11 as the math coach.

12) Does the math coach:	**Coach full time**	**Coach part time. teach part time**	**Coach part time. other duties part time**
	◯	◯	◯

13) In your interactions with the math coach. so far this school year. how often have the following events occurred?	**Never**	**1-2 times**	**3-5 times**	**6-10 times**	**11-20 times**	**More than 20 times**
a. My mathematics coach observed my teaching (for at least 10 minutes).	◯	◯	◯	◯	◯	◯
b. I discussed my teaching with my mathematics coach.	◯	◯	◯	◯	◯	◯
c. I observed my mathematics coach demonstrate teaching in a classroom (for at least 10 minutes).	◯	◯	◯	◯	◯	◯
d. I co-taught a lesson with my mathematics coach.	◯	◯	◯	◯	◯	◯
e. I engaged in a coaching cycle (pre-planned lesson together. taught lesson while coach observed. and reflected together on lesson afterwards) with my mathematics coach.	◯	◯	◯	◯	◯	◯

14) So far this school year. how often has the math coach assisted you with the following?	**Never**	**Rarely**	**Sometimes**	**Often**
a. Identifying which math tasks or	◯	◯	◯	◯

instructional activities to use.				
b. Introducing (or launching) a lesson.	◯	◯	◯	◯
c. Understanding the mathematical goals for a given lesson.	◯	◯	◯	◯
d. Classroom management.	◯	◯	◯	◯
e. Grouping students in the classroom.	◯	◯	◯	◯
f. Supporting students (e.g.. questioning) as they work in groups.	◯	◯	◯	◯
g. Supporting students to explain their own thinking.	◯	◯	◯	◯
h. Supporting students to explain each other's thinking.	◯	◯	◯	◯
i. Leading a concluding whole-class discussion of students' solutions.	◯	◯	◯	◯
j. Acquiring materials related to mathematics instruction.	◯	◯	◯	◯
k. Matching the curriculum to the standards.	◯	◯	◯	◯
l. Analyzing data.	◯	◯	◯	◯
m. Supporting struggling students to participate in regular classroom activities.	◯	◯	◯	◯

15) Regarding the math coach. to what extent do you agree or disagree with each of the following statements?	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
a. My math coach communicates a clear vision for mathematics instruction.	◯	◯	◯	◯	◯
b. My math coach possesses a thorough knowledge of the curriculum and related instructional materials.	◯	◯	◯	◯	◯
c. The purpose of my math coach visiting my classroom is to directly assist me in improving my teaching.	◯	◯	◯	◯	◯
d. The purpose of my math coach visiting my classroom is to formally evaluate my teaching.	◯	◯	◯	◯	◯
e. My math coach possesses a thorough knowledge of the math content I teach.	◯	◯	◯	◯	◯
f. My math coach possesses a thorough knowledge of high quality middle school math instruction.	◯	◯	◯	◯	◯
g. My math coach is a highly skilled mathematics teacher.	◯	◯	◯	◯	◯
h. My math coach is effective in supporting math teachers to improve their instruction.	◯	◯	◯	◯	◯
i. My math coach understands the challenges of teaching mathematics at this school.	◯	◯	◯	◯	◯
j. My math coach's vision of what makes math instruction high quality is compatible with my own.	◯	◯	◯	◯	◯
k. My math coach respects math teachers in this school.	◯	◯	◯	◯	◯
l. I trust my math coach at his/her word.	◯	◯	◯	◯	◯
m. I feel comfortable going to my math coach when I am confused about how to teach certain mathematics concepts.	◯	◯	◯	◯	◯

16) What is the name of the administrator (e.g.. principal. assistant principal. dean of students) that is responsible for evaluating your performance as a mathematics teacher?	_____

The next questions pertain to your interactions with the administrator you named above.

17) So far this school year. how often have the following events occurred?	**Never**	**1-2 times**	**3-5 times**	**6-10 times**	**11-20 times**	**More than 20 times**
a. I discussed my teaching with this administrator.	○	○	○	○	○	○
b. This administrator observed my teaching (for at least 10 minutes).	○	○	○	○	○	○
c. This administrator provided me with feedback to improve my instruction after observing my teaching.	○	○	○	○	○	○
d. This administrator reviewed my students' work with me.	○	○	○	○	○	○
e. This administrator provided feedback on introducing (or launching) a lesson.	○	○	○	○	○	○
f. This administrator provided feedback on conducting a concluding whole-class discussion on students' solutions.	○	○	○	○	○	○
g. This administrator provided feedback on supporting students (e.g.. through questioning) as they work in groups.	○	○	○	○	○	○

18) So far this school year. how often has this administrator assisted you with the following?	**Never**	**Rarely**	**Sometimes**	**Often**
a. Identifying which math tasks or instructional activities to use.	○	○	○	○
b. Introducing (or launching) a lesson.	○	○	○	○
c. Understanding the mathematical goals for a given lesson.	○	○	○	○
d. Classroom management.	○	○	○	○
e. Grouping students in the classroom.	○	○	○	○
f. Supporting students (e.g.. questioning) as they work in groups.	○	○	○	○

g. Supporting students to explain their own thinking.	◯	◯	◯	◯
h. Supporting students to explain each other's thinking.	◯	◯	◯	◯
i. Leading a concluding whole-class discussion of students' solutions.	◯	◯	◯	◯
j. Acquiring materials related to mathematics instruction.	◯	◯	◯	◯
k. Matching the curriculum to the standards.	◯	◯	◯	◯
l. Analyzing data.	◯	◯	◯	◯
m. Supporting struggling students to participate in regular classroom activities.	◯	◯	◯	◯

19) Regarding this administrator. to what extent do you agree or disagree with each of the following statements?	**Strongly Disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
a. The purpose of this administrator visiting my classroom is to assist me in improving my teaching.	◯	◯	◯	◯	◯
b. The purpose of this administrator visiting my classroom is to formally evaluate my teaching.	◯	◯	◯	◯	◯
c. This administrator appreciates the challenges involved in using the curriculum effectively.	◯	◯	◯	◯	◯
d. When this administrator observes me teaching. s/he listens to what students say about mathematics.	◯	◯	◯	◯	◯
e. When this administrator observes me teaching. s/he pays attention to the mathematical tasks/instructional activities that students are working on.	◯	◯	◯	◯	◯
f. When this administrator observes me teaching. s/he listens to the kinds of questions that I ask.	◯	◯	◯	◯	◯
g. This administrator respects math teachers in this school.	◯	◯	◯	◯	◯
h. This administrator has confidence in the expertise of the math teachers.	◯	◯	◯	◯	◯

i. I trust this administrator at his/her word.	◯	◯	◯	◯	◯
j. I feel comfortable going to this administrator when I have questions or concerns.	◯	◯	◯	◯	◯
k. This administrator can be counted on to follow through when a math teacher asks for assistance.	◯	◯	◯	◯	◯
l. It's OK in this school to discuss feelings. worries. and frustrations with this administrator.	◯	◯	◯	◯	◯
m. This administrator takes a personal interest in the professional development of math teachers.	◯	◯	◯	◯	◯
n. This administrator at this school is an effective manager who makes the school run smoothly.	◯	◯	◯	◯	◯

20) To what extent do you agree or disagree that this administrator does the following?	**Strongly Disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
a. Makes clear his or her expectations for meeting instructional goals in mathematics.	◯	◯	◯	◯	◯
b. Actively monitors the quality of mathematics teaching in this school.	◯	◯	◯	◯	◯
c. Understands how children learn mathematics.	◯	◯	◯	◯	◯
d. Sets high standards for student learning in mathematics.	◯	◯	◯	◯	◯
e. Sets high standards for teaching in mathematics.	◯	◯	◯	◯	◯
f. Presses mathematics teachers to implement what they have learned in professional development.	◯	◯	◯	◯	◯
g. Carefully tracks student academic progress in mathematics.	◯	◯	◯	◯	◯
h. Knows what is going on in my classroom.	◯	◯	◯	◯	◯
i. Communicates a clear vision for our school.	◯	◯	◯	◯	◯
j. Participates in instructional planning with teams of mathematics teachers.	◯	◯	◯	◯	◯

21) To what extent does this administrator expect you to do the following things?	**Not at all**	**To a small extent**	**To a moderate extent**	**To a great extent**
a. Adhere to a prescribed pacing in my instruction.	◯	◯	◯	◯
b. Lead a concluding whole-class discussion of students' solutions.	◯	◯	◯	◯
c. Support students (e.g.. questioning) as they work in groups.	◯	◯	◯	◯
d. Collaborate with other mathematics teachers.	◯	◯	◯	◯
e. Observe other mathematics teachers' instruction.	◯	◯	◯	◯
f. Use him/her as a resource when instructional problems arise.	◯	◯	◯	◯
g. Make my lesson plans available for review.	◯	◯	◯	◯
h. Assist other mathematics teachers in improving their instruction.	◯	◯	◯	◯
i. Introduce (or launch) a lesson.	◯	◯	◯	◯
j. Support struggling students to participate in regular classroom activities.	◯	◯	◯	◯
k. Work with the math coach on improving specific instructional practices (e.g.. launching tasks. questioning strategies. etc.).	◯	◯	◯	◯

The next set of questions pertains to the SCHOOL or DISTRICT PROFESSIONAL DEVELOPMENT you have received so far this school year (including last summer).

22) So far this school year (including last summer). how much time in total hours have you spent in professional development workshops or seminars in mathematics or mathematics education?	_____

If you answered "0" to question 22. please skip to question 25.

23) To what extent were the following topics addressed in professional development sessions. and. if they were addressed. to what extent have they impacted your instruction? (Mark one choice for each: If the topic was not addressed, you can	**Topic Was Addressed**	**Impacted My Instruction**
a. Meeting state standards or assessment requirements.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
b. Which math tasks or instructional activities to use.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
c. Introducing (or launching) a lesson.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
d. Understanding the mathematical goals for a given lesson.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
e. Classroom management.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
f. Grouping students in the classroom.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
g. Supporting students (e.g.. questioning) as they work in groups.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
h. Supporting students to explain their own thinking.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
i. Supporting students to explain each other's thinking.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
j. Deepening my knowledge of mathematics.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent

k. Leading a concluding whole-class discussion of students' solutions.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent
l. Effectively using CMP2.	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent	◯Not at all ◯To a small extent ◯To a moderate extent ◯To a great extent

24) To what extent do you agree or disagree with the following statements about school and district professional development sessions this school year (including last summer)? The professional development sessions…	**Strongly Disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly Agree**
a. Included opportunities to work productively with other math teachers.	◯	◯	◯	◯	◯
b. Advocated practices I do not believe in.	◯	◯	◯	◯	◯
c. Led me to use strategies that engaged all my students in challenging. problem-solving tasks.	◯	◯	◯	◯	◯
d. Made me question my beliefs and assumptions about which teaching methods work best with students.	◯	◯	◯	◯	◯
e. Focused on too many topics.	◯	◯	◯	◯	◯
f. Were successfully linked to each other to form a coherent program (and not just a bunch of disjointed sessions).	◯	◯	◯	◯	◯
g. Were consistent with the way my teaching performance was evaluated.	◯	◯	◯	◯	◯
h. Were consistent with my own goals for instruction.	◯	◯	◯	◯	◯

25) To what extent do you agree or disagree with the following statements about CMP2?	**Strongly disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
a. CMP2 contains useful information for me about underlying mathematical ideas.	◯	◯	◯	◯	◯
b. CMP2 provides me with useful information about how to teach particular mathematical ideas and procedures.	◯	◯	◯	◯	◯

c. CMP2 provides me with useful information about what students typically know. can do. or have difficulty with.	◯	◯	◯	◯	◯

26) To what extent is CMP2 consistent with each of the following?	**Not at all**	**To a small extent**	**To a moderate extent**	**To a great extent**
a. My personal beliefs about effective teaching methods.	◯	◯	◯	◯
b. Ways of teaching mathematics promoted in professional development sessions.	◯	◯	◯	◯
c. The mission of my school.	◯	◯	◯	◯

27. Which of the following topics do you discuss in scheduled meetings (e.g.. grade level math meetings. department meetings) with math teachers at your school (select all that apply)?

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____
- ❑ I do NOT attend scheduled meetings of math teachers.

If you selected “I do NOT attend scheduled meetings of math teachers”. please skip to question 29.

28. Who is generally a part of those meetings (e.g.. all 8th grade math teachers. all math teachers in my school. math coach. principal)?

_____

29. Is there anyone. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

30. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

31. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

32. Yukarıda belirttiğiniz kişi ile düzenli toplantılar dışınd hangi sıklıklarda görüşüyorsunuz?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

33. Is there anyone else. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

34. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

35. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

36. How often do you talk to this person outside of scheduled meetings?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

37. Is there anyone else. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

38. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

39. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

40. How often do you talk to this person outside of scheduled meetings?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

41. Is there anyone else. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

42. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

43. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

44. How often do you talk to this person outside of scheduled meetings?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

45. Is there anyone else. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

46. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

47. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

48. How often do you talk to this person outside of scheduled meetings?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

49. Is there anyone else. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

50. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

51. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

52. How often do you talk to this person outside of scheduled meetings?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

53. Is there anyone else. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

54. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

55. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

56. How often do you talk to this person outside of scheduled meetings?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

57. Is there anyone else. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

58. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

59. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

60. How often do you talk to this person outside of scheduled meetings?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

61. Is there anyone else. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

62. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

63. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

64. How often do you talk to this person outside of scheduled meetings?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

65. Is there anyone else. in your school or in the district. who you talk to about teaching mathematics outside of scheduled meetings?

- ❍ Yes
- ❍ No

If you selected "No" to the above question. please skip to question 69.

66. What is the name and role of the person you talk to most about teaching mathematics outside of scheduled meetings? Please write full first name and last name (if known). and give a brief description of that person's role or position (e.g.. teacher at my school. teacher at another school. assistant principal. principal. district math leader). Please specify only ONE person. You will have the opportunity to specify more people in subsequent questions.

Name _____

Role _____

67. Outside of scheduled meetings. I talk to this person about (select all that apply):

- ❑ Which math tasks or instructional activities to use
- ❑ Introducing (or launching) a lesson
- ❑ The mathematical goals for a given lesson
- ❑ Classroom management
- ❑ Grouping students in the classroom
- ❑ Supporting students (e.g.. questioning) as they work in groups
- ❑ Supporting students to explain their own thinking
- ❑ Supporting students to explain each other's thinking
- ❑ Leading a concluding whole-class discussion of students' solutions
- ❑ Other _____

68. How often do you talk to this person outside of scheduled meetings?

- ❍ Daily or almost daily
- ❍ Once or twice per week
- ❍ Once or twice per month
- ❍ A few times per year

Lastly. we would like to ask you for some demographic/biographic information.

69. What is your gender?

- ❍ Male
- ❍ Female

70. What is your ethnicity/race? Choose all that apply.

- ❑ African American or Black
- ❑ Asian American
- ❑ Caucasian or White
- ❑ Hispanic. Latino/a. or Spanish Origin
- ❑ American Indian or Alaska Native
- ❑ Pacific Islander
- ❑ Other (Please Specify): _____

71. In what year were you born? Write your response in the line below (example: 1972).

_____

72. Which of the following most accurately describes the type of teaching certificate/license/credential that you currently hold?

- ❍ Full certification (including advanced professional. regular/standard. probationary)
- ❍ Partial certification (including temporary. provisional. or emergency state certificate)
- ❍ No state certification (including certificate not from the state and no certificate)

73. Please select all the grade levels for which you are certified. Choose all that apply.

- ❑ Elementary
- ❑ Middle Grades
- ❑ Secondary (7-12)
- ❑ Other (Please Specify): _____

74. If you have any additional endorsements. please list them below.

1. _____
2. _____
3. _____
4. _____

75. Considering all of your college and graduate education. how many college or university courses have you completed in the following subject areas? Each course should be counted only once. (Check the box in each row that corresponds to the correct number.)	**0**	**1**	**2**	**3**	**4**	**5 or more**
a. Methods of teaching mathematics	◯	◯	◯	◯	◯	◯
b. Mathematics content courses for teachers (e.g.. middle school mathematics for teachers).	◯	◯	◯	◯	◯	◯
c. Calculus and other advanced mathematics courses for which calculus was a prerequisite.	◯	◯	◯	◯	◯	◯

76. Next to each type of postsecondary degree you have received. type in the full name of the college or university from which it was obtained. your major field(s) of study. and minor field(s) of study (if applicable).

	Full name of college or university	**Major field of study**	**Minor field of study. if applicable**
a. Associate's degree			
b. Bachelor's degree #1			
c. Bachelor's degree #2			
d. Master's degree #1			
e. Master's degree #2			

f. Other: _____			

77. Counting this year. how many years in total have you taught mathematics?

_____

78. How many years in total have you taught any subject?

_____

79. In what year did you begin teaching in this school? If you have had a break in service of one year or more. please report the year that you returned to the school. Do not include time spent as a student teacher.

_____

You have reached the end of this survey. We appreciate you taking the time to help us learn more about mathematics instruction in your school(s) and district.

Please contact us with any questions or comments:

Erin Henrick
erin.henrick@vanderbilt.edu
Project Manager. Vanderbilt Study of Middle School Mathematics

APPENDIX M

STRUCTURAL EQUATIONS FOR TPTO OF TURKISH MIDDLE SCHOOL MATHEMATICS TEACHERS

Structural equations for TPTO of Turkish middle school mathematics teachers were given at the following page.

ClassMan = - 0.00799*t_respect+0.181*positive+0.0469*t_feedback+0.294*negative+0.0225*deprivati - 0.0529*collastudent

Standerr	(0.0591)	(0.0544)	(0.0477)	(0.0578)	(0.0624)	(0.0546)
z-values	-0.135	3.326	0.983	5.078	0.360	-0.968
p-values	0.892	0.001	0.326	0.000	0.719	0.333

- 0.101*tools + 0.0533*collainst, Errorvar.= 0.814 , R^2 = 0.186

Standerr	(0.0481)	(0.0534)	(0.0597)
z-values	-2.100	0.997	13.619
p-values	0.036	0.319	0.000

SSupport = 0.0393*t_respect + 0.300*positive + 0.119*t_feedback + 0.198*negative + 0.159*deprivati - 0.111*collastudent

Standerr	(0.0539)	(0.0496)	(0.0435)	(0.0527)	(0.0569)	(0.0498)
z-values	0.729	6.039	2.729	3.747	2.801	-2.232
p-values	0.466	0.000	0.006	0.000	0.005	0.026

- 0.0566*tools + 0.0902*collai, Errorvar.= 0.677 , R^2 = 0.323

Standerr	(0.0439)	(0.0487)	(0.0497)
z-values	-1.288	1.852	13.619
p-values	0.198	0.064	0.000

Error Covariance for SSupport and ClassMan = 0.391

(0.0435)
8.978

APPENDIX N

STRUCTURAL EQUATIONS FOR TPTO OF USA MIDDLE SCHOOL MATHEMATICS TEACHERS

Structural equations for TPTO of USA middle school mathematics teachers were given at the following page.

ClassMan = - 0.178*ResDep+0.312*positive+ 0.00984*collainst + 0.237*negative - 0.0477*tools

Standerr	(0.0714)	(0.0674)	(0.0682)	(0.0726)	(0.0620)
Z-values	-2.490	4.631	0.144	3.269	-0.770
P-values	0.013	0.000	0.885	0.001	0.442

- 0.0867*t_feedback + 0.0834*collastudent - 0.0846*collaClass, Errorvar.= 0.829 , R^2 = 0.171

Standerr	(0.0613)	(0.0664)	(0.0677)	(0.0761)
Z-values	-1.414	1.256	-1.249	10.885
P-values	0.157	0.209	0.212	0.000

SSupport = - 0.0484*ResDep + 0.309*positive + 0.0214*collainst + 0.179*negative + 0.0282*tools

Standerr	(0.0704)	(0.0665)	(0.0672)	(0.0715)	(0.0611)
z-values	-0.687	4.648	0.318	2.508	0.462
p-values	0.492	0.000	0.750	0.012	0.644

- 0.0971*t_feedback+ 0.120*collastudent+ 0.0360*collaClass, Errorvar.= 0.804 , R^2 = 0.196

Standerr	(0.0604)	(0.0655)	(0.0667)	(0.0739)
z-values	-1.607	1.833	0.540	10.885
p-values	0.108	0.067	0.589	0.000

Error Covariance for SSupport and ClassMan = 0.430

(0.0599)

7.171

APPENDIX O

STRUCTURAL EQUATIONS FOR TPSA OF TURKISH MIDDLE SCHOOL MATHEMATICS TEACHERS

Structural equations for TPSA of Turkish middle school mathematics teachers were given at the following page.

ClassMan = 0.142*p_trust - 0.129*p_assist + 0.0601*p_feedback + 0.101*leadership + 0.0678*account - 0.0279*p_observation

Standerr	(0.0727)	(0.0661)	(0.0617)	(0.0767)	(0.0766)	(0.0705)
z-values	1.957	-1.951	0.973	1.311	0.885	-0.395
p-values	0.050	0.051	0.330	0.190	0.376	0.693

- 0.0816*accountI, Errorvar.= 0.958 , R^2 = 0.0424

Standerr	(0.0672)	(0.0702)
Z-values	-1.215	13.638
P-values	0.224	0.000

SSupport = 0.149*p_trust - 0.0411*p_assist + 0.113*p_feedback + 0.178*leadership - 0.00802*account - 0.0126*p_observation

Standerr	(0.0702)	(0.0638)	(0.0596)	(0.0740)	(0.0739)	(0.0681)
z-values	2.129	-0.645	1.891	2.400	-0.109	-0.185
p-values	0.033	0.519	0.059	0.016	0.914	0.853

+ 0.0258*accountI, Errorvar.= 0.892 , R^2 = 0.108

Standerr	(0.0648)	(0.0654)
Z-values	0.398	13.638
P-values	0.691	0.000

Error Covariance for SSupport and ClassMan = 0.567

(0.0562)
10.089

APPENDIX P

STRUCTURAL EQUATIONS FOR TPSA OF USA MIDDLE SCHOOL MATHEMATICS TEACHERS

Structural equations for TPSA of USA middle school mathematics teachers were given at the following page.

ClassMan= 0.258*TrustLead-0.317*Assist+ 0.116*Accout + 0.161*Feedback-0.00982*p_observation - 0.0519*AccountI

Standerr	(0.0989)	(0.0853)	(0.0777)	(0.0844)	(0.0830)	(0.0816)
z-values	2.606	-3.722	1.496	1.911	-0.118	-0.636
p-values	0.009	0.000	0.135	0.056	0.906	0.524

Errorvar.= 0.893 , R^2 = 0.107

Standerr	(0.0817)
z-values	10.931
p-values	0.000

SSupport = 0.304*TrustLead - 0.179*Assist + 0.164*Account + 0.0804*Feedback - 0.0896*P_Observation+

Standerr	(0.0969)	(0.0836)	(0.0762)	(0.0827)	(0.0813)
z-values	3.139	-2.141	2.148	0.973	-1.102
p-values	0.002	0.032	0.032	0.331	0.271

0.0676*AccoutI, Errorvar.= 0.857 , R^2 = 0.143

Standerr	(0.0800)	(0.0784)
z-values	0.845	10.931
p-values	0.398	0.000

Error Covariance for SSupport and ClassMan = 0.491

(0.0649)
7.565

CURRICULUM VITAE

PERSONAL INFORMATION

Surname. Name: Sevgi. Sevim
Nationality: Turkish (TC)
Date and Place of Birth: 07 July 1982. Sivas
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email: sevimsevgi@gmail.com

EDUCATION

Degree	Institution	Year of Graduation
MS	METU Secondary School Science and Mathematics Education	2009
BS	METU Elementary Education	2004
Minor Degree	METU Physics	2004
High School	Prof.Dr. N. Erşen Anadolu Öğretmen Lisesi. Sivas	1999

WORK EXPERIENCE

Year	Place	Enrollment
2004- Present	METU Secondary School Science and Mathematics Education	Research Assistant
2012-2013	Vanderbilt University- Peabody College of Education	Visiting Scholar
2009-2013	Cito Turkey	Researcher

FOREIGN LANGUAGES

English. Basic German. Basic French