THE EFFECT OF GRADE LEVEL ON ELEMENTARY SCHOOL STUDENTS' MOTIVATIONAL BELIEFS IN SCIENCE

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

SAVAŞ GÜNGÖREN

IN PARTIALLY FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN THE DEPARTMENT OF
ELEMENTARY SCIENCE AND MATHEMATICS EDUCATION

FEBRUARY 2009

Approval of the Graduate School of Social Sciences

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ABSTRACT

THE EFFECT OF GRADE LEVEL ON ELEMENTARY SCHOOL STUDENTS' MOTIVATIONAL BELIEFS IN SCIENCE

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February 2009, 96 pages

The aim of this study was twofold: first, to investigate the effect of grade level on students' motivational beliefs (self-efficacy, intrinsic value, mastery goals and performance goals) in science, and second to examine the relationships between students' motivational beliefs and their science grades. The Turkish version of the Approaches to Learning Instrument (mastery goals and performance goals) and the Motivated Strategies for Learning Questionnaire (self-efficacy and intrinsic value) were used as data collection instruments.

The Turkish version of the Approaches to Learning Instrument (ALI) was adopted into Turkish and pilot tested with 390 elementary school students. The main study was applied to 900 elementary school students in Grades 6 through 8 from 5 randomly selected schools in Bolu.

The data obtained from the measuring instruments were analyzed by using Multivariate Analyses of Variance (MANOVA) and correlation analyses. Results of the analyses revealed that grade level has a significant effect on students' motivational beliefs and as grade level increases student motivation in science declines. Accordingly, 6th grade students are found to be more self-efficacious in science and they show more intrinsic interest in science and study science course for the reasons of learning and mastering as well as showing their abilities to others compared to 7th grade and 8th grade students. Concerning the motivational level of 7 and 8 graders, results also showed that 7 graders' motivational beliefs are more favorable than 8 graders. Moreover, results revealed significant positive relationships between all motivational belief variables and science grade in all grade levels except for the performance goal orientation. Additionally, significant positive relationships were found among all motivational belief variables.

Keywords: Science, Grade Level, Motivational Belief, Self-Efficacy, Intrinsic Value, Mastery Goals, Performance Goals

ÖZ

SINIF DÜZEYİNİN İLKÖĞRETİM ÖĞRENCİLERİNİN FEN DERSİNDEKİ GÜDÜSEL İNANÇLARINA ETKİSİ

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Şubat 2009, 96 sayfa

Bu çalışmanın amacı, sınıf düzeyinin ilköğretim öğrencilerinin güdüsel inançlarına (öz-yeterlilik, içsel değerler, ustalık hedefi ve başarım hedefi) olan etkisini araştırmak ve öğrencilerin fen dersindeki karne notlarıyla söz konusu güdüsel inançları arasındaki bağlantılar incelemektir. Bu amaçla, Öğrenme Yaklaşımları Anketi (ustalık hedefi ve başarım hedefi) ve Öğrenmede Güdüsel Stratejiler Anketinin (öz-yeterlilik ve içsel değerler) Türkçe Versiyonu veri toplama araçları olarak kullanılmıştır.

Öğrenme Yaklaşımları Anketi, Türkçe' ye uyarlanmış ve pilot çalışması 390 ilköğretim öğrencisiyle gerçekleştirilmiştir. Asıl çalışma, Bolu ilinden rastgele seçilen 5 ilköğretim okulunun 2. kademesine (6. 7. ve 8. sınıf) devam etmekte olan toplam 900 öğrencisiyle gerçekleştirilmiştir.

Veri toplama ölçekleriyle elde edilen veriler çoklu varyans analizi ve korelasyon analizi kullanılarak değerlendirilmiştir. Araştırma sonuçları,

öğrencilerin sınıf düzeylerinin güdüsel inançları üzerinde anlamlı bir etkisi olduğunu ortaya koymuş; 6. sınıf öğrencilerinin 7. ve 8. sınıf öğrencilerine göre öz-yeterliliklerinin daha gelişmiş, fen dersine karşı içsel ilgilerinin daha fazla ve fen dersini öğrenme ve öğrendiklerini başkalarına göstererek onlarla rekabete girme isteklerinin daha yoğun olduğunu göstermiştir. 7. ve 8. sınıf öğrencileri karşılaştırıldığında ise 7. sınıf öğrencilerinin bu güdüsel inançlarının 8. sınıf öğrencilerinden daha yüksek olduğu ortaya çıkmıştır. Bu sonuçlar, öğrencilerin sınıf düzeylerinin arttıkça fen dersine yönelik güdüsel inançlarının azaldığını göstermektedir. Ayrıca, bu çalışmadan elde edilen bir başka sonuca göre, bütün sınıf seviyeleri için öğrencilerin fen dersi başarıları, onların başarım hedefi harici tüm güdüsel özellikleri ile pozitif ilişki içersinde bulunmuştur. Buna ek olarak çalışma sonuçları, tüm güdüsel özelliklerin kendi içersinde pozitif bir ilişkiye sahip olduğunu ortaya koymuştur.

Anahtar Kelimeler: Fen, Sınıf Düzeyi, Güdüsel İnanç, Öz-Yeterlilik, İçsel Değer, Ustalık Hedefleri, Başarım Hedefleri

To My Parents

Hatice GÜNGÖREN

and

Musa GÜNGÖREN (Rest in Peace)

ACKNOWLEDGEMENTS

The completion of my degree of master and this thesis represents the work, encouragement, and support of many people to whom I am very thankful.

First of all, I am grateful to my mother for her understanding and supporting. I always feel your encouragement.

I wish to express my deepest gratitude to my father. I always feel you and your support inside me. All these are your achievement. Thank you my father, rest in peace.

I would like a to express my deepest gratitude and thanks to my supervisor Assoc. Prof. Dr. Semra SUNGUR for her guidance, valuable advice, encouragements and patience throughout the duration of my thesis work. Thank you sincerely.

I would also like to thank Assist. Prof. Dr. Nihal DOĞAN for her great support and encouragement. You always make me feel relax with your support and make me positive with your cheerful dialogs.

I wish to express my special thanks to Seda ÇAVUŞ. You always encourage and support during tough times. Your help and great support are very valuable to me.

Sincere gratitude also is extended to Ministry of Education, school principals, science teachers, and students who agreed to participate in this research.

Finally, I thank the members of my committee for their willingness to serve on the committee and their valuable feedback.

Thank you all very much indeed.

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LIST OF ABBREVIATIONS

MSLQ-TV : Turkish version of the Motivated strategies for Learning Questionnaire

ALI : Approaches to Learning Instrument

DV : Dependent Variable

IV : Independent Variable

MANOVA : Multivariate Analyses of Variance

Df : Degree of Freedom

N, n : Sample Size

α : Significance Level

CHAPTER 1

INTRODUCTION

Considerable research in education has focused on investigation of the motivational factors and their antecedents in students' science learning (Pintrich & DeGroot, 1990, Şenler & Sungur, in press). According to Palmer (2007), students' interests in science have decreased over last twenty years. This negative approach of students to the science courses starts at late primary and early elementary school years, and it is much more clearly observed during late elementary and high school years. This situation may be attributed to the difficulties that students experience in understanding scientific principles, concepts and applying them to their daily lives. These difficulties in science learning can negatively influence their approach to the science concepts and their science achievement. In addition to these, students sometimes refuse what scientist and their teachers said about science concepts because these facts make contradictions with their previous knowledge (Hynd et al., 2000). As a result, most of the students tend to avoid choosing science related courses or careers in the future.

Hence, motivation is considered to be an important factor to promote students' cognitive and behavioral engagement in science and their subsequent performance. Pintrich and Schunk (2002, p. 5) defined motivation as 'the process whereby goal-directed activity is instigated and sustained'. 'With this definition motivation is conceptualized as a process rather than a product' (p.5). The mean of the process is the goals and the

efforts that individuals put forth to realize these goals. Accordingly, a person is said to be motivated when he/she is ready to do something with an aim in the mind and is ready for the action. In view of that, student motivation is one of the most important components of motivation concept in the literature. Indeed, researchers have an increased interest to the students' motivation and its effects on their performance over last twenty years (Hsieh et al. 2008). Some of these researchers stated that motivation is about students' adoption of any task, the effort they spend on it, and aim to finish that task (Maehr, 1984; Pintrich, Marx, & Boyle, 1993). As a result, the researchers claimed that students' motivation influence their academic performance and achievement. Motivated students are likely to be involved in the activities which can improve their learning and understanding such as attending all the lessons, taking notes systematically during instructions, and asking for help when needed (Zimmerman & Martinez-Pons, 1992). All these activities will promote students' learning. However, the students with lower levels of motivation are less likely to be involved in such activities which can improve their learning, i.e., they are less likely to attend regularly to the lessons, to take notes systematically, and to ask for help when needed (Pintrich & Schunk, 2002).

In the literature, motivation studies mainly focused on three motivational variables considered to be important in students' learning namely, self-efficacy, intrinsic value, and goal orientations (mastery and performance goals). Indeed, according to the Expectancy-Value Theory (Eccles and Wigfield, 2002), students' academic behaviors are associated with their expectancies for success and their task value perceptions. The expectancy component of the theory corresponds to the Bandura's (1997) conception of the self-efficacy. Bandura (1986, p. 391) defined self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances." Accordingly,

self efficacy refers to the students' beliefs about their abilities to effectively deal with school work. Related research has demonstrated that self-efficacious students set challenging goals for themselves, use cognitive and metacognitive strategies with regularity and persist longer in the face of difficulties and distracters (Hoy, 2004). In addition, students' beliefs about the value of the task and their goal orientations determine why they are involved in a task (Eccles & Wigfield, 2002; Pintrich & DeGroot, 1990). Actually, in expectancy-value theory, value component includes intrinsic value which can be defined as the students' pleasure and satisfaction while doing a task. Students with higher levels of intrinsic value engage in a task for their own sake due to the satisfaction that they experience. Additionally, goal orientations which can be defined as the goals that people set by themselves influencing their motivations and actions have an important role in students' learning. In the early literature, goal orientations have been investigated as mastery and performance goal orientations. Students with mastery goals, give their attention to the mastery of a task with the aim of developing their understanding and skills. On the other hand, students with performance goal orientation tend to study for the reasons of getting the best grade, showing their abilities to others, and looking smart. Students with mastery goal orientations are found to use variety of strategies in their learning, persist in the face of difficulties and to have higher levels of academic achievement. However, research on performance goal orientation produced mixed results; while in some studies performance goals are found to be associated with adaptive outcomes, in other studies they are found to be linked to maladaptive outcomes. When a distinction was made between performance approach and performance avoidance goals, it is found that performance avoidance goals which involves the intention of avoiding challenging tasks and failure are found to be related to maladaptive

outcomes such as giving up easily when faced with difficulties and using surface approaches to learning (Pintrich & Schunk, 2002).

Studies in the literature revealed that as grade level increases, students' motivational beliefs become less favourable. For example, the study conducted by Wigfield et al. (1997) to investigate the changes of elementary school students' competence beliefs and subjective task values in some subject domains revealed a significant decrease in students' competence beliefs and task values across grade levels. Similarly, Jacobs et al.'s (2002) study showed that students' competence beliefs and task value scores significantly decreased from grade 1 through grade 12. Other similar studies in the literature also indicated that grade level has significant effect on students' motivational beliefs. Therefore, it is important to examine whether the same situation exist in Turkey. When related studies are conducted, the findings interpreted considering the Turkish educational system may have important implications for teachers and educators. Accordingly, the overarching aim of the present study is to examine elementary students' self-efficacy, intrinsic value and goal orientations change across grade levels. Additionally, the relationships among students' self-efficacy, intrinsic value and goal orientations, and their science grade will be investigated.

1.1 Significance of the Study

In today's world, education has a very vital role for the future of countries. In the huge educational area, science is one of the most important components of education and science education has major and crucial importance in this area. In the field of science education, lots of difficulties and obstacles standing to be overcame. In science education, teachers face

with lots of difficulties. Students perceive science as a very difficult and complex field; so they are not generally enthusiastic about engaging in science activities and experience difficulties in understanding the science concepts (Green & Miller, 1996). Low level of student motivation in science is considered to be one of the main reasons of these difficulties (Kremer & Walberg, 1981; Napier & Riley, 1985). Indeed, related literature suggests that motivation is one of the key educational and psychological concepts to consider dealing with such kinds of problems effectively. Accordingly, the present study aims at examining grade level as one of the factors influencing students' motivation, which is closely linked to their academic performance, as a first step for improving science learning. Therefore, the present study has potential to highlight the factors that can affect students' motivation in science learning. Interpretation of the findings considering the Turkish educational system may have important implications for teachers and educators and provide a feedback for the revision of curriculum and the education system in general.

1.2 Definition of the Important Terms

Motivational Belief: It refers to set of beliefs including students' self-efficacy, intrinsic value, mastery goals and performance goals.

Self-Efficacy: It refers to the extent to which the learner perceives his/her ability to master a task. It includes the learner's judgments about his/her ability to complete a task and confidence in his skills to conduct the task.

Intrinsic Value: It refers to perceived importance and usefulness of the task and the pleasure and satisfaction that students gain while doing the task.

Mastery Goal: It involves the goal of improving one's learning and understanding.

Performance Goal: It involves the goal of competing with others, presenting the competence and getting positive social impression.

CHAPTER 2

LITERATURE REVIEW

This literature review chapter presents the literature about students' motivational beliefs concerning self efficacy, intrinsic value, and goal orientations (mastery and performance goals). Also, the literature about how students' motivation is affected by their grade level is discussed.

2.1 Student Motivation

Many researchers in the field of educational psychology have been interested in understanding students' motivation to improve their academic performance for last twenty years (Hsieh et al., 2008). Researchers have suggested that motivation is related to students' enthusiasm for starting a task, the amount of endeavor that they spend on the task, and their persistance in completing the task (Brophy, 1988; Maehr, 1984; Pintrich, Marx, & Boyle, 1993; Wigfield, 1994). Thus, motivation has been suggested as an important factor affecting students' actions and academic achievement.

When literature about students motivation is examined, it was revealed that the studies generally about students' motivational characteristics, and the effects of these characteristics on students learning and achievement. For example, studying with 173 seventh grade students, Pintrich and De Groot (1990) investigated the relationship among students'

motivational beliefs, self-regulation and academic performance. The students involved in the study were from Science and English classrooms. The Motivated Strategies for Learning Questionnaire (MSLQ) was used to measure students' motivation and self-regulation. According to the results of the study, self-efficacy had a significant positive correlation (r=.33) with cognitive strategy use. Moreover, intrinsic value had a positive correlation (r=.63) with cognitive strategy use. Beside these findings, self efficacy had a significant positive correlation (r=.44) with self regulated learning and intrinsic value had a positive correlation (r=.73) with self regulated learning. The findings also showed that higher levels of self efficacy and intrinsic value were associated with higher levels of the student achievement.

In another research, Greene et al. (2004) designed a study to investigate the influence of students' perceptions of classroom settings on their self efficacy, achievement goals in a task, and perceptions of instrumentality of class work. The participants were 220 high school students who registered in English classes. They filled out a series of questionnaires across three months. According to the results, achievement variable was positively correlated with motivational variables. The most significant correlation was found between achievement variable and mastery goal orientation. All the motivational beliefs positively and significantly correlated within each other and with classroom perceptions. Another outcome of the study was achievement directly affected by only self efficacy and meaningful strategy use. Beside this, performance-approach goals did not affect achievement and meaningful strategy use.

Another study held by Özkan (2003) examined the relationship between three motivational beliefs (self-efficacy, intrinsic value, and test anxiety) and students' biology achievement. The participant students were (N= 980) 10^{th} grade Turkish high school students. The participants filled out

the Turkish version of the MSLQ. The results of the study revealed a positive correlation between self-efficacy (r=.179), intrinsic value (r=.143), test anxiety (r=.166) and biology achievement.

In a recent study, Sungur (2007) investigated how students' motivational beliefs and metacognition support their performance under consequential and nonconsequential test conditions. The sample was 58 college students (43 girls and 15 boys) between the ages 20 to 25 (M=21.19). The results of the study showed that mastery goal orientation most significantly related with task value (r=.515) and self-efficacy belief (r=.377). Beside these, task value positively correlated with self-efficacy (r=.285). However, the results of the study did not reveal any significant relation between performance goal orientation and other motivational beliefs.

As a conclusion, student motivation is an important construct to be examined in educational studies and accordingly, it possesses a comprehensive literature in academic studies. According to most of the studies, student motivation is an important factor that affects students' academic works and achievements.

2.2 Motivational Beliefs

2.2.1 Self Efficacy

Expectancy-value model of achievement suggests that students' achievement behaviors like academic performance are directly associated with their expectancies for success and their perception of task value (Eccles & Wigfield, 2002; Wigfield, 1994). In the model, expectancy for success involves students' beliefs about how well they will perform on upcoming

tasks while task value involves beliefs about reasons for doing the task. Expectancy for success is analogous to Bandura's (1997) efficacy expectations and is task- and context-specific. Bandura (1986, p. 391) defined self efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances." According to Bandura's (1986, 1997) theory, students generate their self-efficacy beliefs with the help of information supported from four sources (Britner & Pajares, 2006). The first and most effective source is 'mastery experience' which entails students' interpretion of their previous activities and their results to create and develop their self-efficacy beliefs. The interpretations of successful experiences provide more confidence to the students and increase their levels of self-efficacy, while unsuccessful experiences generally decrease their level of self-efficacy. The second source of self-efficacy beliefs is 'vicarious experience' which involves monitoring of other students' task performances. This information helps students to evaluate their performance and success on the tasks which were performed also by others. 'Social persuasion' is another source of information that involves exposure to others' verbal and nonverbal assessments and judgments. Positive persuasions can encourage and strengthen the self-efficacy beliefs, while negative persuasions can impair and destroy them. The fourth and final information source of self-efficacy beliefs is 'physiological states' which comprises states like stress, mood, anxiety, and arousal. Positive physiological states may provide high self-efficacy and success, while negative physiological states lower students' self-efficacy beliefs by decreasing their performance.

Some of the researchers stated that people who believe that they can successfully finish a task i.e., those who have high self efficacy are likely to do a work better as compared the people who does not have such a belief (Jackson, 2002; Lane & Lane, 2001; Pajares, 1996; Pajares, 2003). Beside

this, Hsieh et al. (2008) stated that the students with high self efficacy beliefs deal with more difficult and challenging tasks, spend much more effort and try new ways to make learning meaningful. In addition to these, Linnenbrink & Pintrich (2003) revealed that the students with high self efficacy have more engagement to a task, they learn better and show greater performance. However, low self efficient students keep away from the learning task and chances to get help from others; moreover, when these low self efficacious students face with self-doubts and difficulties while doing a task, they stop doing it (Bandura, 1997; Pintrich & Schunk, 1995).

Considerable research suggested that self efficacy is an important factor of academic achievement and motivation (Graham & Weiner, 1996; Pajares, 2003; Pintrich & DeGroot, 1990; Pintrich & Schunk, 1995). Britner and Pajares (2006) also stated that self-efficacy is a significant predictor of academic achievement, the choice of course taken, and career decisions through domains and age levels.

In a recent study, Shim and Ryan (2005) investigated the relations between students' achievement goals and changes in self-efficacy, challenge avoidance, and intrinsic value in relation to grades. The sample was 361 college students. The students filled out the questionnaire two times; firstly, at the beginning of the semester (Time 1) and secondly, after students took their first exam (Time 2, about 3-5 weeks later). According to the results of the study, the mean level of self-efficacy decreased from the beginning of the semester (M=5.70) through the first exam (M=5.42) that students were administered. The correlation between students' grade and self-efficacy at Time 2 was positive (r=.28); β=.23, $t(354)=5.56$, $p < .001$, this showed that getting high grades related with increased self-efficacy. Also, a mastery goal had positive relation with self-efficacy at Time 2, β=.11, $t(354)= 2.32$, $p <$

.05. However, performance-approach goal had no relations with self-efficacy at Time 2.

Britner and Pajares (2006) examined the sources of self-efficacy hypothesized from Bandura (1997) to predict the science self-efficacy beliefs of middle school students. The sample was 319 (164 girls, 155 boys) public middle school students from 5th through 8th grades students. The participants filled out the 'Sources of Science Self-Efficacy Scale' to measure the sources of Science self-efficacy. According to the results, all of the hypothesized sources of self-efficacy (e.g. mastery experiences, vicarious experiences, social persuasions, and psychological arousal) correlated within each other, with science self-efficacy, and also with students' science grades. Gender differences also emerged in the study that girls' science grades were higher (3.3 to 3.1) than did boys. Girls also had high anxiety (2.6 to 2.2) than boys about their science class performance and they had high confidence about successfully regulating their studies (4.7 to 4.3) than did boys. However, boys had higher mastery experiences (4.2 to 3.9) than girls according to the results of the study.

Moreover, in a study examining the effect of classroom environment on students' self-efficacy and science knowledge, Hsieh et al (2008) found that in technology-rich learning environment, there was a significant increase in students' self-efficacy levels and science knowledge. Beside these, correlation analyses showed that students' science achievement positively correlated with students' self-efficacy at both the pretest and posttest. The authors suggested that technology-rich environment provides students with opportunities to feel autonomous in their learning promoting their self-efficacy and science knowledge.

To sum up, self efficacy is an important motivational belief that affects the students' academic works and achievements and can be

influenced by classroom environments that students experience. When examining the literature, it is generally revealed that positive self-efficacy beliefs promote academic achievement positively.

2.2.2 Intrinsic Value

In expectancy-value model of achievement, the value component is composed of four main constructs; attainment value, intrinsic value, utility value, and cost. Intrinsic value is a significant construct of task value and it is defined as the pleasure and satisfaction that students gain while doing the task. Intrinsic value is similar to intrinsic motivation defined by Deci & Ryan (1985). The second expectancy-value component is attainment value which entails the personal importance of a success on the task. Other value components are utility value which concerns how a task correlates with anybody's future goals, and cost value which involves the perception of how engaging in one task or activity restricts access to other tasks and activities (Wigfield & Eccles, 2000).

Related research has demonstrate that students' intrinsic interest in academic the tasks is positively related to their academic choices, performance, persistence, cognitive strategy use, and motivation (Pajares, 1996; Pintrich & DeGroot, 1990; Pintrich, Smith, Garcia & McKeachie, 1993; Wigfield & Eccles, 2000). For example, in a study examining the relationship between 6th grade students' motivational beliefs, self-regulated learning, and academic performance, Pintrich and DeGroot (1990) showed that students' self-efficacy and intrinsic value were positively linked to their self-regulation and cognitive strategy use.

Moreover, studying with high school students, DeBacker and Nelson (2000) investigated the student motivation in learning science. The sample

consisted of 242 students enrolled in physics (n=53), advanced placement physics (n=22), accelerated chemistry (n=76), and biology (n=91). According to the results, students' intrinsic value scores showed strong positive correlations with their learning goals (r=.70), performance goals (r=.25), pleasing the teacher (r=.21), and perceived instrumentality (r=.06); while intrinsic value of the students showed negative correlations with their perceived science difficulty (r=-.49), and stereotyped views of science (r=-.11). Additionally, students with higher levels of intrinsic value in science were found to have higher levels of perceived ability in science.

In a different study, Cocks and Watt (2004) examined the relationships among students' perceived competence, intrinsic value and mastery goals for English and Math subject domains. The participants were 60 sixth-grade students from two government schools. The results of the study revealed that there was a significant association between students' perceived competence and intrinsic value for both English and Math. In addition, it was found that, intrinsic value and mastery goals were not significantly correlated for both English and Math subject domains. According to the authors, this finding supported the view that intrinsic value and mastery goals represent different constructs in academic motivation. Based on the results, the authors stated that higher levels of perceived competence caused higher levels of intrinsic value which supported mastery goals.

Recently, Shih (2005) studied the association between achievement goals and students' intrinsic value. The participants were 6th grade students (N=198) from Taiwan. Results revealed that students' intrinsic value had strong positive correlation (r=.77) with their mastery goals. Also, students' performance approach goals positively correlated (r=.19) with their intrinsic value. However, students' performance-avoidance goals had negative

correlation (r=-.18) with their intrinsic value according to the results of the study.

In another study, Nagy et al. (2006) investigated the effects of intrinsic value and self-concept on students' course selection in upper secondary education. The sample was 1,148 secondary school students from Germany. The participants were asked to fill out math and biology achievement tests, and several extensive questionnaires about psychological demographic constructs. The students firstly completed questionnaires at the end of 10^{th} grade and secondly, at the middle of 12^{th} grade. The results indicated that students' self-concepts and intrinsic values in Grade 10 had significant effect on their course enrollment in Grade 12 and this effect was mediated by gender.

To summarize, intrinsic value is an important construct in the task value component of Expectancy-Value Theory. The studies applied before, show us generally that strong intrinsic value scores result with strong academic developments and achievement.

2.2.3 Goal Orientation

Elliot and Harackiewicz (1996) stated that, students' aims to learn new tasks or the goals that they have for learning are named goal orientation. Goal orientation is the goals that people assign for themselves which affect their actions, reactions, and motivation for learning (Shim & Ryan, 2005). According to Ames (1992) and Dweck (1986), much more attention should be devoted to students' goal orientation due to its imperative effects on students' academic performance.

According to the Pintrich (2000a), goal orientation is supposed to express an ordered system of beliefs about ability, competence, effort, errors, and success. This ordered system may not only work in a definite situation, but individuals may also reach and use other systems of beliefs. The important point is that anybody can reach different goal orientations in different situations.

Previous research examined two types of goal orientations namely, mastery goals and performance goals (Ames, 1992). However, recent research has suggested a revision in this dichotomy to include the distinction between approach and avoidance goals (Elliot & McGregor, 2001; Elliot & Harackiewicz, 1996). In line with this idea, four goal orientations have been proposed: mastery approach goals, mastery avoidance goals, performance approach goals, and performance avoidance goals. While mastery-approach goals concentrate on learning and mastering a task, mastery-avoidance goals concentrate on avoiding misunderstanding, not learning and not mastering a task. In the literature, there are a few research examining mastery avoidance goals, and most of the research investigates on the mastery approach goals. Concerning the performance goals, performance-approach goals emphasizes being the best student and looking smart while performance-avoidance goals focus on avoiding challenging tasks and being inferior (Elliot, 1997; Elliot & Harackiewicz, 1996).

Church et al. (2001) proposed that mastery goals are associated with persistence when faced with obstacles, challenge seeking, and intrinsic motivation to learn. According to Pintrich (2000b), students which have mastery goals show higher levels of self efficacy, positive effect, assignment value and interest. Apart from their positive association with other motivational constructs, mastery goals are also found to be positively related

to academic achievement (Middleton & Midgley, 1997; Midgley & Urdan, 1995; Shim & Ryan, 2005; Pajares, Britner, & Valiante, 2000).

Another goal orientation is performance goal orientation, focuses on competing with other students, presenting the competence and getting positive social impression (Smith, Duda et al. 2002). Performance goal orientation gives different outcomes in the literature. According to researchers, performance goals needed to be divided into two distinct parts: performance-approach goals and performance-avoidance goals (Elliot, 1997; Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Skaalvik, 1997). Performance-approach goals emphasizes presenting ability, exhibiting other students and reaching positive social judgments; however, performance-avoidance goals focus on avoiding failure and avoiding being embarrassed in classroom environment. For that reasons, performance-avoidance goal is aimed to avoid unwanted social judgments (Elliot & Church 1997; Smith, Duda, et al., 2002).

According to some researchers, students with performance-approach goals have high self-efficacy to show their competence and prefer challenging tasks; however, students with performance-avoidance goals are likely to have lower self-efficacy and intrinsic value for learning and to prefer less challenging tasks (Elliot, 1999; Hidi & Harackiewicz, 2000; Pajares et al., 2000; Skaalvik, 1997). Also, Wolters et al. (1996) reported that junior high school students' performance-approach goals were positively related with their self-efficacy. However, in another study, Anderman and Midgley (1997) revealed that performance-approach goals related with 6th graders' competence perceptions; in contrast to this, 5th graders' competence perceptions were unrelated with their performance-approach goals. Beside these, Middleton and Midgley (1997) made a research with another sample of junior high school students and the study

showed that, students' performance-approach goals were unrelated with their self-efficacy, while students' performance-avoidance goals had negative relations with their self-efficacy beliefs.

In conclusion, goal orientations have vital role in academic works and achievement of the student. According to the literature, it is generally revealed that strong mastery approach goal orientations are associated with positive academic outcomes such as higher levels of cognitive, behavioral, and motivational engagement while performance-avoidance goal orientations are associated with negative outcomes (Chouinard et al., 2007; Dekker & Fischer, 2008; Pintrich, 2000a).

2.3 Effect of Grade Level on Motivational Beliefs

According to the related literature, students' grade level is a significant key concept that affects students' motivation (Eccles et al., 1993; Wighfield & Ecceles, 1994; Trumper, 1995; Lepper, Corpus & Iyengar, 2005; Yeung & McInerney, 2005; Otis, Grouzet & Pelletier, 2005). In related literature, studies generally exhibit that with some exceptions (e.g., Harter, 1982), students' motivational beliefs decrease as their grade level increases especially through elementary school years (Eccles, Midgley, & Adler, 1984; Marsh, 1989; Nicholls, 1979; Parsons & Ruble, 1977; Stipek & Mac Iver, 1989). For example, Marsh (1989) examined some academic and non academic domains of elementary school students and the study revealed straight forward decrease in students' competence beliefs through elementary school years.

The effects of grade level on motivation can be examined in two parts according to the former studies. Some investigators examined the grade level effect during a school period (i.e., elementary school period), while

other investigators examined the grade level effect through a school transition period (from preschool to elementary school or elementary to high school transition).

To begin with the grade level effect of a school period; Eccles, Wigfield, Harold, and Blumenfeld (1993) examined the elementary school students' developmental process of self and task perceptions. The sample inolved 284 first graders (142 girls and 142 boys), 320 second graders (169 girls and 151 boys), and 261 fourth graders (134 girls and 127 boys) ranging in age from 7 to 10. The participants filled out a questionnaire related to their perceptions of competence beliefs and task value beliefs about 'math, reading, sports, and instrumental music.' According to the results of the study, students' mean scores of competence beliefs of the subjects were decreased as their grade level increased except from 'Throwing' activity. Moreover, students' mean subjective task value scores were found to decrease as their grade level increased in the domains of reading and music.

In a similar study, Wigfield, Eccles, Harold, Arbreton, Freedman-Doan, Blumenfeld and Yoon (1997) examined the changes of elementary school students' competence beliefs and subjective task values of math, reading, instrumental music, and sports over three years. At first year, 865 first-, second-, and third-grade students participated the study; and at the end of the third year, these students become fourth-, fifth- and sixth-grade approximately 615 students. These students constitute Group 1 (first graders in year 1 and third graders in year 3) had 195 students, Group 2 (second graders in year 1 and fourth graders in year 3) had 210 students, and Group 3 (third graders in year 1 and fifth graders in year 3) had 210 students. The students filled out questionnaires measuring their competence beliefs and task values about the subject domains (math, reading, instrumental music, and sports) at every spring time. According to the results of the study,

students' competence beliefs decreased across three-year period in each subject domain for the Group1 and Group 2; and the most significant decrease exhibited in music. Beside these, students' beliefs about the usefulness and importance of the different activities also decreased for each group and each subject domain through three-year period. Also, students' interest in reading and instrumental music showed decrease for all groups, but sports did not show significant decrease. These results supported the findings of former studies showing a decrease in the students' competence beliefs and valuing various activities across grade levels (e.g. Eccles, 1984; Eccles, Midgley & Adler, 1984; Marsh, 1993; Marsh et al., 1991; Stipek & Mac Iver, 1989; Wigfield et al., 1991).

Moreover, as an extension of the abovementioned studies, Jacobs et al. (2002) investigate the changes of students' competence beliefs and task values from grade 1 through grade 12. The sample consisted of 761 students and these students filled out the questionnaire each spring between the years 1989 to 1999; and that questionnaire measured students' competence beliefs and task values about their math, language art and sports domains. According to the results of the study, like previous researches, competence beliefs scores had significant decreases through grade level increases in all three subject domain. In addition to this result, task value scores showed similarities with competence beliefs results and had significant decrease from grade 1 through grade 12.

In other study, Lepper, Corpus and Iyengar (2005) explored the grade level effect on students' intrinsic and extrinsic motivation. The sample was 797 students in Grades 3 through 8. The results showed that there was a decrease in intrinsic and extrinsic motivation as grade level increases. In fact, students' intrinsic motivation showed significant linear decrease from 3rd grade (M=4.07, SD=.67) through 8th grade (M=3.42, SD=.75), F(5,

791)=19.27, p<.001; while extrinsic motivation showed significant linear decrease between 3rd and 4th grade and then it showed a little changes through 8th grade F(5, 791) = 5.05, p<.001.

In addition, Yeung and McInerney (2005) investigated the students' school motivation aspiration over high school years. The sample was 199 students who were 7th, 9th, and 11th graders. In the study, task and effort orientations constituted mastery goal orientations, competition orientation was a performance goal orientation, and praise orientation represented the extrinsic goal orientation. According to the results of the study, there was a significant decrease across grade levels concerning students' mastery goals (task orientation M=4.37 for 7th grade, M=3.72 for 9th grade, and M=3.76 for 11th grade, $F[2,196] = 13.30$, $p < .01$; and effort orientation M=3.36 7th grade, M=3.03 for 9th grade, and M=3.15 for 11th grade, $F[2,196] = 3.19$, $p < .05$) and extrinsic goal (praise orientation M=3.29 for 7th grade, M=3.00 for 9th grade, and M=2.84 for 11th grade, $F[2,196] = 5.55$, $p < .05$) Regarding task orientation, the difference at 9th and 11th grades was not statistically significant. Also, students' performance goal (competition orientation M=3.20 for 7th grade, M=3.07 for 9th grade, and M=2.91 for 11th grade, $F[2,196] = 1.93$, $p > .05$) orientations did not differ among three grade level. In conclusion, students' goal orientations were found to be at higher levels at 7th grade level and then, they started to decrease through grade levels.

A recent study held by Metallidou and Vlachou (2007) examined the contextual differences in the relations among several motivational, cognitive and metacognitive elements of self-regulated learning and performance in language and math subject areas. The participants were 263 students who were at 5th (N=114) grade, and 7th (N=149) grade from 13 primary schools. Students filled out the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich and De Groot, 1990). The questionnaire consisted of five

sub-scales: self-efficacy, intrinsic value, test anxiety, cognitive strategy use, and self-regulation strategies. According to results of the study, students' self-efficacy and task value (intrinsic value) scores decreased from 5th grade through 6th grade at both language and math subjects areas. Also, students' both cognitive and regulatory strategy use scores decreased while their grade level increased at two subject areas. However, students test anxiety scores increased with their increasing grade level at both language and math subject areas.

The literature concerning the changes in students' motivational beliefs across transition period (from elementary to high school) also reveals similar results. For instance, Wigfield et al (1991) investigated the effects of school transition on young adolescents from elementary school to junior high school. The sample was 1,850 young adolescents and they filled out the questionnaire twice a year across two years: transition from 6th grade (elementary school) to 7th grade (junior high school). The questionnaire measured students' self-perceptions and self-esteem values in some subjective domains (math, English, social activities and sports) through the transition period. According to the findings, all self-perceptions and self-esteem values were exhibit significant decrease through transition period from 6th grade to 7th grade at all subjective domains; however, after this transition decrease, most of the self-perceptions and self-esteem values showed increase during 7th grade period.

Similarly, Gottfried et al. (2001) investigated the continuity of students' academic intrinsic motivation from childhood through late adolescence. The sample was 96 students (43 girls, 53 boys). According to the results of the study, students' academic intrinsic motivation decreased significantly at the transition period from middle school to late adolescence. The most significant decreased took place for Math, then for Science and

Reading subject domains; however Social Studies domain did not show significant decrease. According to researchers; these results revealed that the decreases in academic intrinsic motivation were about specific subject domains, not valid for all subject domains.

In addition, Meece and Miller (2001) examined the motivational goals (task-mastery, performance, and work-avoidant) of elementary school students. The study was conducted with 432 students which were divided into cohorts that Cohort 1 contained 203 third, fourth, and fifth graders; while Cohort 2 contained 228 third and fourth graders. The students filled out the questionnaire every fall and spring of each year, and the questionnaire included five-item each that they were 'The Task-Mastery Goal Scale', 'The Performance Goal Scale', and 'The Work-Avoidant Goal Scale.' The results of the study revealed that students' task-mastery goal scores decreasing through grade levels for both Cohort 1 and Cohort 2 except transition from 4^{th} grade to 5^{th} grade for Cohort 1 (there was a significant increase from M=3.13 to M=3.34). When looking at the students' performance goals, the scores decreased continuously through the increased grade level for both cohorts. The work-avoidant goal scores of the students did not show any definite increasing or decreasing score characteristics. For a final outcome, students' goal scores has changed significantly in a school year period, not the transition period from fall to spring semesters.

Otis, Grouzet, and Pelletier (2005) also examined the effects of school transition period from junior to senior high school on students' motivation. The sample consisted of 646 students (N=321 boys, N=322 girls, and 3 undefined) who filled out the questionnaire every spring semester across three years from 8^{th} grade through 10^{th} grade. The students made their school transition from 8^{th} grade (junior high school) to 9^{th} grade (senior high school). The findings showed that, the students' intrinsic motivation (from

M=3.72 to M=3.15) and all types of extrinsic motivation (from M=4.21 to M=3.98 for external regulation; from M=3.52 to M=2.82 for introjected regulation; and from M=4.42 to M=4.02 for identified regulation) decreased significantly at transition period from junior high school to senior high school.

Moreover, Guerrero (2005) investigated the effects of school transition from elementary school to middle school on students' motivational traits. In the study, 68 students filled out the questionnaire at elementary school first time, and then at middle school second time. The questionnaire investigated the students' intrinsic motivation traits (curiosity for learning, some mastery and performance goals) and extrinsic motivation traits (choosing easy works, wishing to satisfy the teacher, and dependence on the teacher). The findings revealed that students' intrinsic motivational traits (curiosity for learning, some mastery and performance goals) and extrinsic motivational traits (choosing easy works, wishing to satisfy the teacher, and dependence on the teacher) decreased while students' grade level increases. However; according to the results of the study, school transition did not contribute extra decrease in the scores of motivational traits.

As a conclusion, students' grade level is an important factor in their motivational beliefs. The literature examines the effect of grade level at two distinct parts: during a school period and school transition period. It is generally revealed in the literature that as grade level increases, motivational beliefs become less favorable. This result was valid for both a school period and school transition period.

CHAPTER 3

PROBLEMS AND HYPOTHESES

This chapter includes main problems, related sub-problems and the hypothesis of the study.

3.1 The Main Problems

The Main problems of the study stated as follows;

1) Is there a significant mean difference among 6^{th}, 7^{th}, and 8^{th} grade students with respect to academic motivation (self-efficacy, intrinsic value, mastery goal orientation and performance goal orientation)?

2) What is the relationship among students' self-efficacy, intrinsic value, mastery goal orientation, performance goal orientation and science grade in each grade level (Grade 6, 7, and 8)?

3.2 The Sub-problems

1) Is there a significant mean difference among 6^{th}, 7^{th}, and 8^{th} grade students with respect to self-efficacy?

2) Is there a significant mean difference among 6^{th}, 7^{th}, and 8^{th} grade students with respect to intrinsic value?

3) Is there a significant mean difference among 6th, 7th, and 8th grade students with respect to mastery goal orientation?

4) Is there a significant mean difference among 6th, 7th, and 8th grade students with respect to performance goal orientation?

5) Is there a significant relationship among 6th grade students' self-efficacy, intrinsic value, mastery goal orientation, performance goal orientation and science grade?

6) Is there a significant relationship among 7th grade students' self-efficacy, intrinsic value, mastery goal orientation, performance goal orientation and science grade?

7) Is there a significant relationship among 8th grade students' self-efficacy, intrinsic value, mastery goal orientation, performance goal orientation and science grade?

3.3 Hypotheses

The problems stated above are tested with the following null hypotheses.

Null Hypothesis 1: There is no significant mean difference among 6th, 7th, and 8th grade students with respect to academic motivation (self-efficacy, intrinsic value, mastery goal orientation, and performance goal orientation).

Null Hypothesis 2: There is no significant relationship among students' self-efficacy, intrinsic value, mastery goal orientation, performance goal orientation and science grade in each grade level.

CHAPTER 4

METHOD

In the previous chapters, problems and hypothesis of the study were presented, related literature was reviewed and the significance of the study was justified. In the following chapter, population and sampling, description of the variables, instruments of the study, procedure, and methods used to analyze data and assumptions, and limitations will be explained briefly.

4.1 Population and Sample

All 6^{th}, 7^{th}, and 8^{th} grade regular elementary school students in Turkey were identified as the target population of this study. However, it is hard to contact with this target population; it is appropriate to define an accessible population. For this reason, the accessible population was determined as the 6^{th}, 7^{th}, and 8^{th} grade regular elementary school students from Bolu region. This is the population which the results of this study will be generalized. All of the students attended to this study were regular public school students.

The sample size of the study was 900 elementary school students. The sample of the study was chosen from one district, the city center of Bolu. The sample of the study was obtained by the cluster random sampling integrated with convenience sampling method. In Bolu region, the schools which were determined as clusters were randomly selected.

Sample characteristics concerning gender, age, grade level and previous year's science grade are shown at Table 4.1 and graphically displayed in Figure 4.1. According to these figure and table, students' ages range from 11 to 16, most with ages 12 (26,9 %), 13 (35,8 %) and 14 (29,1 %) with an overall mean age of 13,01 years (SD=0,95). The participants of the study were 437 girls (48,6 %) and 463 boys (51,4 %); totally 900 elementary school students. The number of students at each grade level was almost equal. There were 6th graders (n=299, 33,2 %) 7th graders (n=299, 33,2 %), and 8th graders (n=302, 33,6 %) in the sample. Participants' previous year science grades ranged from 1 to 5 with an overall mean of 3.5.

Table 4.1 Students' Gender and Grade Level Distribution

Grade Level	Gender		Total	Age (*M*)	ScienceGrade (*M*)
	Girls	Boys			
6	136	163	299	12.01	3.87
7	146	153	299	13.08	3.38
8	155	147	302	13.93	3.25
Total	437	463	900	13.01	3.50

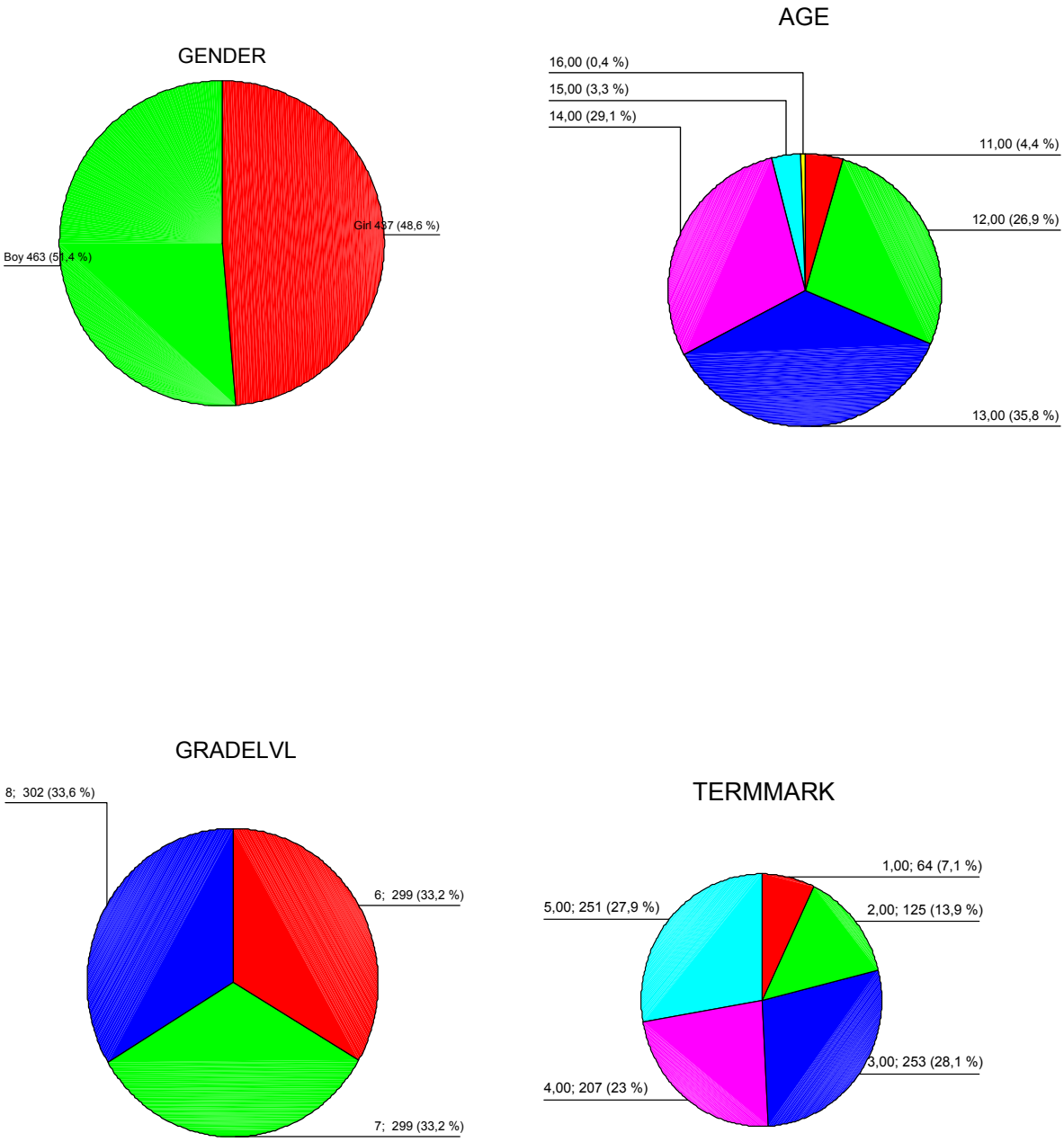

Figure 4.1 Distributions of Students' Gender, Age, Grade Level and Science Grade

4.2 Variables

There are five variables involved in this study, which are categorized as dependent and independent variables. There are four dependent variables (DVs) and one independent variable (IV).

Table 4.2 Identification of the Variables

Type of the Variable	Name of the Variable	Type of the Value	Type of the Scale
DV	Mastery Goals	Continuous	Interval
DV	Performance Goals	Continuous	Interval
DV	Self-Efficacy	Continuous	Interval
DV	Intrinsic Value	Continuous	Interval
IV	Grade Level	Discrete	Nominal

4.2.1 Dependent Variables

The dependent variables of this study are motivational beliefs (mastery goals, performance goals, self-efficacy and intrinsic value). These four dependent variables are continuous variables measured on interval scale.

4.2.2 Independent Variables

The independent variable of this study is elementary school students' grade-level. Grade-level is considered as a discrete variable and measured on nominal scale. Grade levels of the students are coded as six for 6^{th} grade, seven for 7^{th} grade, and eight for 8^{th} grade.

4.3 Data Collection Instruments

In this study, two instruments were used in order to obtain data from students. These instruments are Turkish version of the Approaches to Learning Instrument (ALI) and the Motivated Strategies for Learning Questionnaire (MSLQ-TV) (see Appendix A). The students were completed scales of the Approaches to Learning Instrument (mastery goals and performance goals) and scales of the Motivated Strategies for Learning Questionnaire (self-efficacy and intrinsic value).

At the beginning of the questionnaire, personal information like age, gender, grade level and science grade of the students are asked.

4.3.1 Motivated Strategies for Learning Questionnaire – Turkish Version (MSLQ-TV)

Motivated Strategies for Learning Questionnaire (MSLQ) was developed by Pintrich and De Groot (1990) and adapted into Turkish by Özkan (2003). This instrument has 44-item and includes five subscales. Three of these subscales (self-efficacy, intrinsic value and test anxiety) measures students' motivational beliefs and two of them (cognitive strategy

use and self-regulation) measures students' self-regulated learning. The original questionnaire has 7-point Likert scale (1=not at all true of me to 7=very true of me) however, in this study, 4-point-Likert scale (1 = strongly disagree to 4 = strongly agree) was used.

In this study, the items of the two subscales of MSLQ (self-efficacy and intrinsic value) were used to measure students' motivational beliefs. In the questionnaire, self-efficacy subscale (α= .82) has nine items (e.g. 'I am certain I can understand the material presented in this class'). The students having high scores on this subscale were certain that they could learn the subject which were given them in the class and they show high performance in the class. In the questionnaire, the intrinsic value subscale (α=.78) has also nine items about intrinsic interests and importance of class performance. A high-score on this subscale indicates that students perceive the material used in the class work as effective, important and useful.

4.3.2 Approaches to Learning Instrument (ALI)

Approaches to Learning Instrument developed by Miller et al. (1996) was used to assess students' goal orientations as mastery goals and performance goals. It is a 4-point Likert type scale ranging from strongly disagree to strongly agree. Mastery goal orientation (α=.81) was assessed by 5 items (e.g. 'I do the work in this class because I want to learn new ideas and skills') whereas performance goal orientation (α=.80) was assessed by 4 items (e.g. 'I do the work in this class because I want others to think I am smart'). Students with high scores on mastery goals indicate that these students have ability and capacity to focus on mastering, learning and understanding a task (Pintrich & Schunk, 2002). This means that these students have high levels of learning and achieving the task (Douglas,

2002). Beside this, students with high scores on performance goals indicate that these students focus on competing with other students, and showing their competence to them.

4.3.3 Validity and Reliability of the Measuring Tools

In this study, the Turkish version of the MSLQ-TV was translated and adapted into Turkish by Özkan (2003). During its adaptation to Turkish the MSLQ was examined by group of experts from the Department of Modern Languages and Department of Foreign Languages at METU. In addition, the instrument was checked by three instructors from the Faculty of Education concerning content and format. For the pilot study, Özkan (2003) administered the MSLQ to 238 tenth-grade students from two schools and a factor analysis together with a reliability analysis was applied. Factor analysis showed that the items of the adapted questionnaire were fit to three distinct motivational factors (self-efficacy, intrinsic value, and test anxiety) when factor number is limited. Internal reliability coefficient of the whole questionnaire was .88 and the reliability coefficients of self-efficacy, intrinsic value, and test anxiety subscales were .79, .82, and .74 respectively by using Cronbach alpha coefficient.

The ALI was translated and adapted into Turkish by researcher. During its adaptation to Turkish expert opinions from the Departments of Basic English and Elementary Education were gathered regarding translation accuracy, cross-cultural equivalence of meaning of words, conceptual equivalence, content, and format. This Turkish version of the ALI was pilot tested with 390 students (196 girls and 194 boys). In order to provide validity evidence, Confirmatory Factor Analyses were conducted. Three of the goodness of fit statistics used were the Goodness of Fit Index

(GFI), the Root Mean Squared Error of Approximation (RMSEA), and the Standardized Root Mean Square Residuals (SRMR). The GFI values greater than 0.90 mean good fit to the data. Beside this, the RMSEA values less than 0.10 indicate good fit to the data. Moreover, SRMR values equal or less than 0.05 mean good fit to the data. Overall, the fit indices indicated a good model fit (see Table 4.3).

Table 4.3 Confirmatory Factor Analysis

Motivational Variables	Fit Statistics						
	χ^2	df	p	GFI	CFI	SRMR	RMSEA
Mastery Goals	7.34	5	.197	.99	.99	.03	.04
Performance Goals	18.92	2	.000	.98	.92	.05	.09

In addition, reliability coefficients were found to be .75 for mastery goals and .74 for performance goals.

4.4 Procedure

The study started with identifying the research problem and stating the search terms related with the problem of interest. After defining the research problem and related search terms, related literature was reviewed in detail. Social Science Citation Index (SSCI), International Dissertation Abstracts, Ebscohost, Educational Resources Information Center (ERIC), Science

Direct and Internet (e.g. Google Scholar) were searched systematically for the previous studies about the research problem and keywords of the problem. MS and PhD theses made in Turkey and abroad related with the research problem also searched from METU library electronic documents database. Also, photocopies of available documents were obtained from METU library. All of the obtained documents were set out and read carefully by the researcher.

After doing pilot study, the revised final copy of the questionnaire was applied to 900 elementary grade students from 5 schools at Bolu Region. The necessary permissions were taken from the Ministry of Education for applying the research instruments. All the necessary explanations about the purpose and procedure for how to complete the questionnaire were made to the students. It was asked to students to complete the entire questionnaire by their own without leaving any empty item. One class hour (40 minutes) was given to the students to complete the questionnaire. At some of the schools and some of the classes, the researcher asked teachers to support the application of the questionnaire because time was restricted and it was impossible to be present each class at this restricted time. These cooperating teachers were well informed about the procedure and directions of the study. There were no difficulties reported during the application of the study.

4.5 Analyses of Data

In this study, the statistical analyses were done by using Statistical Package for the Social Sciences (SPSS 10.0) program. The data obtained from the study were analyzed by using descriptive statistics and inferential statistics.

4.5.1 Descriptive Statistics

Descriptive statistics such as mean, median, mode, standard deviation, range, minimum, maximum, skewness, kurtosis and histograms of the variables were presented.

4.5.2 Inferential Statistics

In order to test the null hypotheses, the statistical technique named one-way Multivariate Analyses of Variance (MANOVA) and bivariate correlations were used.

4.6 Assumptions of the Study

The researcher made these assumptions for the study:

1. The administration of the questionnaire was under standard conditions.

2. All the cooperated teachers were very pleased to be involved and support this research study.

3. The sample in the pilot study has similar characteristics with the sample of the study.

4. All the participant students responded to the questionnaire sincerely and correctly.

4.7 Limitations of the Study

The study was subjected to these limitations:

1. The study is limited to the 900 elementary school students.

2. The student characteristics and entry behaviors such as demographic characteristics, family characteristics, and socio-economic status, were not considered in the study.

3. Learning environments that students' experienced were not examined in the study although learning environments may play a role in students' motivation.

4. This study was limited to science courses. Student motivation in other courses across grade levels can be investigated in future studies.

CHAPTER 5

RESULTS

In this chapter, the results of the data analyses are presented in three parts: In the first part, descriptive statistics of the data are presented. In the second part, inferential statistics in which the null hypothesis is tested are examined. In the third part, the findings of the study are summarized.

5.1 Descriptive Statistics

Descriptive statistics related to four motivational beliefs (self-efficacy and intrinsic value from MSLQ-TV; mastery goals and performance goals from ALI) with respect to grade level of the students are presented in Table 5.1 through Table 5.4 and Appendix B.

5.1.1 Descriptive Statistics of the Self-Efficacy Component of MSLQ-TV

Table 5.1 presents the descriptive statistics of self-efficacy scores which was measured by MSLQ-TV and categorized according to students' grade level. Students' self-efficacy scores could range from 1 to 4 and higher scores in self-efficacy mean that the students learn the subjects well which were given them in the class and they show high performance in the class. Table 5.1 indicates that mean scores of the students decreases as the

grade level of the students increases. According to the Table 5.1, mean score of the 6th grade students is 3.17 while mean score of the 7th grade students is 3.05 and mean score of the 8th grade student is 2.95. These scores indicate that as grade level increases, students become less efficacious about their capabilities to learn and perform effectively.

Table 5.1 Basic Descriptive Statistics Related to Self-Efficacy Scores

Grade Level	6th Grade	7th Grade	8th Grade
N	299	299	302
Mean	3.17	3.05	2.95
S.D.	0.50	0.48	0.49
Range	2.78	2.67	2.44
Skewness	-0.632	-0.465	0.067
Kurtosis	0.525	0.238	-0.431

5.1.2 Descriptive Statistics of the Intrinsic Value Component of MSLQ-TV

Descriptive statistics for intrinsic value scores measured by MSLQ-TV with respect to students' grade level is presented in Table 5.2. Students' intrinsic value scores could range from 1 to 4 and higher scores in intrinsic value mean that the students perceive the material used in the class work as effective, important and useful. Table 5.2 indicates that mean scores of the students decrease as the grade level of the students increases. According to

the Table 5.2, mean score of the 6th grade students is 3.37 while mean score of the 7th grade students is 3.19 and mean score of the 8th grade students is 3.14. These scores indicate that 6th grade students perceive the material used in the class work more effective, important and useful than 7th grade and 8th grade students. Moreover, 7th grade students appear to have more positive value beliefs compared to 8th grade students.

Table 5.2 Basic Descriptive Statistics Related to Intrinsic Value Scores

Grade Level	6th Grade	7th Grade	8th Grade
N	299	299	302
Mean	3.37	3.19	3.14
S.D.	0.40	0.43	0.43
Range	2.22	2.33	2.11
Skewness	-1.191	-0.563	-0.348
Kurtosis	2.137	0.352	-0.055

5.1.3 Descriptive Statistics of the Mastery Goals Component of ALI

Descriptive statistics of mastery goals scores which was measured by ALI and categorized according to students' grade level is presented in Table 5.3. Students' mastery goals scores could range from 1 to 4 and higher scores in mastery goals subscale mean that the students study for the reasons

of learning and understanding. Table 5.3 indicates that mean scores of the students decrease as the grade level of the students increases. According to the Table 5.3, mean score of the 6th grade students is 3.51 while mean score of the 7th grade students is 3.35 and mean score of the 8th grade students is 3.19. These scores indicate that students' tendency to study for learning and mastering the course content decreases as grade level increases.

Table 5.3 Basic Descriptive Statistics Related to Mastery Goals Scores

Grade Level	6th Grade	7th Grade	8th Grade
N	299	299	302
Mean	3.51	3.35	3.19
S.D.	0.49	0.51	0.58
Range	2.60	2.60	2.60
Skewness	-1.341	-0.616	-0.461
Kurtosis	2.510	0.200	-0.265

5.1.4 Descriptive Statistics of the Performance Goals Component of ALI

Table 5.4 presents the descriptive statistics of performance goals scores which was measured by ALI and categorized according to students'

grade level. Students' performance goals scores could range from 1 to 4 and higher scores in performance goals mean that the students have desire to demonstrate their competence relative to others in class works and look smart. Table 5.4 indicates that mean scores of the students decreases as the grade level of the students increases. According to the Table 5.4, mean score of the 6th grade students is 3.30 while mean score of the 7th grade students is 3.15 and mean score of the 8th grade student is 2.93. These scores indicate that as grade level increases, students' performance goal orientations decreases.

Table 5.4 Basic Descriptive Statistics Related to Performance Goals Scores

Grade Level	6th Grade	7th Grade	8th Grade
N	299	299	302
Mean	3.30	3.15	2.93
S.D.	0.65	0.65	0.75
Range	3.00	3.00	3.00
Skewness	-0.882	-0.566	-0.293
Kurtosis	0.317	-0.132	-0.707

5.2 Inferential Statistics

In this study, Multivariate Analyses of Variance (MANOVA) was applied to investigate the effect of grade level on four motivational beliefs of the students. The dependent variables of the study were motivational beliefs (self efficacy, intrinsic value, mastery goals and performance goals) of the students. The independent variable of the study was grade level of the students.

5.2.1 Assumptions of Multivariate Analyses of Variance

5.2.1.1 Sample Size

The number of the cases was greater than the number of dependent variables. So, the sample size of the study was enough to apply the MANOVA analyses.

5.2.1.2 Normality and Outliers

The univariate and multivariate normalities were checked for the normality assumption of the study.

The skewness and kurtosis values and histograms were examined to check the univariate normality (See Table 5.1 to 5.4 and Appendix B).

The 6^{th} grade students' intrinsic value scores have negative skewness value (-1,19) and positive kurtosis value (+2,13). This skewness value indicates that, 6^{th} grade students' intrinsic value scores clustered at the high end (right-hand side of the graph) and the kurtosis value showed that the distribution is peaked (clustered in the centre).

Also, again the 6th grade students' mastery goal scores have negative skewness value (-1,34) and positive kurtosis value (+2,51). This skewness value again indicates that 6th grade students' mastery goal scores clustered at the high end (right-hand side of the graph) and the kurtosis value showed that the distribution is peaked (clustered in the centre). Fortunately, the Central Limit Theorem suggests that regardless of the distribution of variables, sampling distributions of means will be normally distributed if sample size is large enough. Therefore, in the present study, large positive kurtosis values for 6th graders' intrinsic value and mastery goals are not expected to threaten the validity of the MANOVA results.

In addition, other groups' histograms appear to be normally distributed and skewness and kurtosis values of these groups are all in acceptable range (between -1 and +1).

For checking the multivariate normalities, Mahalanobis distance calculated and it was compared with the critical value given in the chi square table for four dependent variables (Tabachnik and Fidell, 1996). The critical chi-square value should be 18.47 for four dependent variables, and the maximum Mahalanobis distance of the sample was 31.54. This value indicates that there were outlying cases and these 16 outlying cases were removed from data and Mahalanobis distance came to an acceptable value (17.73) for the sample.

5.2.1.3 Linearity

In order to examine the linearity assumption, scatter plots were generated for each pairs of dependent variables across the grade levels

(Appendix C). The scatter plots showed that there was no serious significant violation of linearity assumption in different grade levels.

5.2.1.4 Multicollinearity and Singularity

The correlation coefficients between dependent variables were computed to check the multicollinearity assumption. The correlation coefficients ranging from .353 to .678 indicated that the assumption was satisfied (see Table 5.5.). These values also demonstrated that a significant positive correlation exist between the dependent variables of the study. The degree of the relationship was medium to large.

Table 5.5 Correlation Coefficients between Dependent Variables

	1.	2.	3.	4
1. Self Efficacy	-	.620*	.594*	.384*
2. Intrinsic Value		-	.678*	.353*
3. Mastery Goals			-	.464*
4. Performance Goals				-

* Correlation is significant at the 0.01 level (2-tailed).

5.2.1.5 Homogeneity of Variance-Covariance Matrices

The Box's M Test of Equality of Covariance Matrices was conducted to test the homogeneity of variance-covariance matrices. Tabachnick and Fidell (2007) suggested that regardless of the outcome of the Box' M test, the significance tests are expected to be robust if there is no large discrepancy among the sample sizes in each group. In this study, sample size at each grade level was comparable and significance value for Box's M test was greater than .001 (Pallant, 2001). Therefore, it appeared that concerning the homogeneity of variance-covariance matrices assumption, the MANOVA results can be interpreted confidently.

For homogeneity of variance assumption, Levene's Test of Equality of Error Variances was used. Levene's Test of Equality of Error Variances has Sig. value 0.733 for self efficacy, 0.139 for intrinsic value, 0.023 for mastery goals and 0.004 for performance goals. These results suggest that the equality of variance assumption was met for all dependent variables except mastery goals and performance goals. If sample size of the largest group divided by the sample size of the smallest group is smaller than 1.5, the violation of this assumption has minimal effects (Pallant, 2001). Fortunately, the sample sizes of the groups are almost equal, so there is no violation about this assumption. Therefore, validity of MANOVA results in relation to the homogeneity of variance assumption was provided.

5.2.2 Multivariate Analyses of Variance

Problem: Is there a significant mean difference among 6^{th}, 7^{th}, and 8^{th} grade students with respect to academic motivation (self-efficacy, intrinsic value, mastery goal orientation and performance goal orientation)?

H_0: There is no significant mean difference among 6th, 7th, and 8th grade students with respect to academic motivation (self-efficacy, intrinsic value, mastery goal orientation and performance goal orientation).

In order to address aforementioned research question MANOVA was conducted. Results showed a significant mean difference among 6th, 7th, and 8th grade students with respect to the collective dependent variables of self-efficacy, intrinsic value, mastery goal orientation and performance goal orientation, $F(8, 1756)=10.193$, $p=.000$; Wilks' Lambda=.913; partial eta squared=.44. The multivariate eta-squared values based on Wilk's Λ indicated that 44 % of multivariate variance of the dependent variables was associated with the grade level.

Since statistically significant MANOVA F ratios were obtained for the collective dependent variables, univariate ANOVAs were conducted to further understand how Grades 6, 7, and 8 students differ regarding each of the dependent variable. Table 5.6 displayed results of the univariate ANOVA analyses on students' self-efficacy, intrinsic value, mastery goal orientation and performance goal orientation scores. As seen in the table, there was a statistically significant mean difference across grade levels with respect to all dependent variables.

Table 5.6 MANOVA Follow-up Pairwise Comparisons

Motivational Variables	df	Error	F	P	Partial Eta Squared	Observed Power
Self-Efficacy	2	881	14,132	0.000	0.031	0.999
Intrinsic Value	2	881	24.488	0.000	0.053	1.000
Master Goals	2	881	27.709	0.000	0.059	1.000
Performance Goals	2	881	22.370	0.000	0.048	1.000

Post-hoc comparisons using the Scheffe Test also indicated that mean scores of 6th grade students were significantly higher than mean scores of 7th and 8th grade students for all dependent variables. Beside these, mean scores of 7th grade students were significantly higher than mean scores of 8th grade students for mastery goals and performance goals; however, 7th grade students' self-efficacy and intrinsic value scores were not significantly higher than 8th grade students. Therefore, the results suggested a general tendency for the decline in the level of students' motivation in science across grade levels (see Table 5.7. and Table 5.8).

Table 5.7 Mean Scores and Standard Deviations of Students' Motivational Beliefs

Motivational Variables	6th Grade		7th Grade		8th Grade	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Self-Efficacy	3.17	.029	3.05	.029	2.95	.029
Intrinsic Value	3.38	.025	3.20	.025	3.14	.025
Mastery Goals	3.51	.031	3.35	.031	3.19	.031
Performance Goals	3.31	.040	3.15	.040	2.93	.040

Table 5.8 Post-hoc comparisons

Dependent Variable	Grade Level (I)	Grade Level (J)	Mean Difference (I-J)	S.E.	p
Self-Efficacy					
	6	7	.1174*	4.077E-02	.016
	6	8	.2165*	4.077E-02	.000
	7	8	9.914E-02*	4.052E-02	.051
Intrinsic Value					
	6	7	.1795*	3.516E-02	.000
	6	8	.2360*	3.516E-02	.000
	7	8	5.649E-02*	3.495E-02	.271
Mastery Goals					
	6	7	.1644*	4.388E-02	.001
	6	8	.3267*	4.388E-02	.001
	7	8	.1623*	4.362E-02	.001
Performance Goals					
	6	7	.1520*	5.672E-02	.028
	6	8	.3768*	5.672E-02	.000
	7	8	.2247*	5.638E-02	.000

* The mean difference is significant at the .05 level.

In addition, as shown in Figure 5.1 the mean scores of 6th grade students are higher than 7th and 8th grade students for all motivational belief variables; beside these, 7th grade students' mean scores are higher than 8th grade students again for all motivational belief variables. Moreover, students' mastery goals scores are found to be the highest for all grade levels. The figure also demonstrates that intrinsic value scores are the second highest scores across grade levels. However, compared to other motivational beliefs, students' self-efficacy level in science is found to be the lowest for Grade 6 and 7. In grade 8, it is slightly higher than performance goals. This finding suggests that although elementary students are likely to study for the reasons of mastering science concepts and show intrinsic interest in science, their beliefs concerning their ability to learn and perform effectively in science lessons are relatively low.

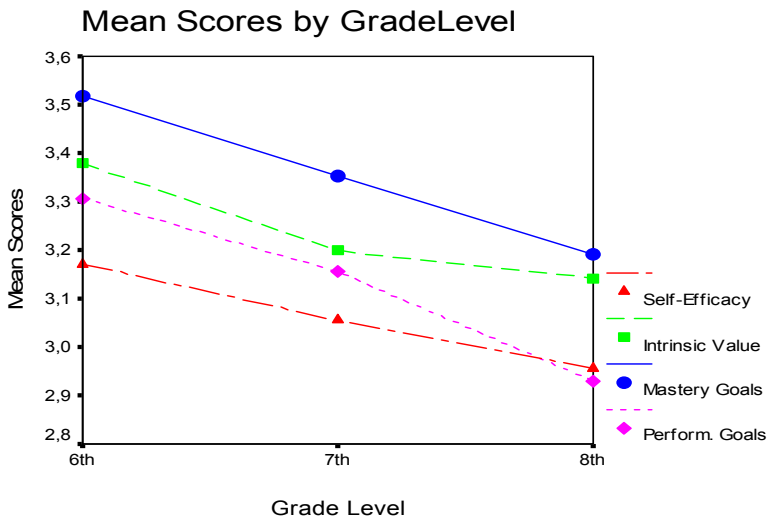

Figure 5.1 Mean Scores of Students' Motivational Beliefs by Grade Level

5.2.3 Correlations between Science Grade and Motivational Beliefs in Each Grade Level

Problem: What is the relationship among students' self-efficacy, intrinsic value, mastery goal orientation, performance goal orientation and science grade in each grade level (Grade 6, 7, and 8)?

H_0: There is no significant relationship among students' self-efficacy, intrinsic value, mastery goal orientation, performance goal orientation and science grade in each grade level.

In order to examine the correlations between science grade and dependent variables, correlation analyses were applied for each grade level.

Table 5.9 summarizes the relationships among 6^{th} grade students' motivational beliefs and science grade. As revealed from the Table 5.9, 6^{th} grade students' science grade has significant positive correlations with their self-efficacy, intrinsic value, and mastery goals; however, a non-significant negative correlation is found between students' performance goals and their science grade. Moreover, results showed that all of the motivational variables were positively correlated within each other.

Table 5.9 Correlation Coefficients between Science Grade and Motivational Beliefs for 6th Grade Students

	1.	2.	3.	4.	5.
1. Science Grade	-	.304*	.217*	.213*	-.069
2. Self-Efficacy		-	.650*	.607*	.412*
3. Intrinsic Value			-	.673*	.318*
4. Mastery Goals				-	.373*
5. Performance Goals					-

* Correlation is significant at the 0.01 level (2-tailed).

Table 5.10 presents information about the relationships between 7th grade students' motivational beliefs and their science grade. Results indicated that science grade has significant positive correlations with self-efficacy, intrinsic value, and mastery goals. However, the relationship between science grade and performance goal was non-significant. In addition, 7th grade students' motivational beliefs are found to significantly and positively correlated with each other. These results were the same as those obtained in Grade 6.

Table 5.10 Correlation Coefficients between Science Grade and Motivational Beliefs for 7th Grade Students

	1.	2.	3.	4.	5.
1. Science Grade	-	.452*	.310*	.248*	-.018
2. Self-Efficacy		-	.580*	.545*	.329*
3. Intrinsic Value			-	.613*	.322*
4. Mastery Goals				-	.535*
5. Performance Goals					-

* Correlation is significant at the 0.01 level (2-tailed).

Table 5.11 summarizes the correlations between 8th grade students' motivational beliefs and science grade. According to the results, students' science grade has significant positive correlations with self-efficacy, intrinsic value, and mastery goals; and negative correlation with performance goals. Moreover, similar to the 6th and 7th grade students, 8th grade students' motivational beliefs are found to have positive correlations within each other.

Table 5.11 Correlation Coefficients between Science Grade and Motivational Beliefs for 8th Grade Students

	1.	2.	3.	4.	5.
1. Science Grade	-	.235*	.075*	.155*	-.161*
2. Self-Efficacy		-	.591*	.584*	.344*
3. Intrinsic Value			-	.697*	.329*
4. Mastery Goals				-	.401*
5. Performance Goals					-

* Correlation is significant at the 0.01 level (2-tailed).

The findings displayed in Table 5.9, Table 5.10, and Table 5.11 revealed that students' science grade is positively correlated with their self-efficacy, intrinsic value, and mastery goals in each grade level. This implies that high level science grades are associated with high levels of self-efficacy, intrinsic value, and mastery goals. Therefore, students who believe that they can perform effectively in science lessons, study for the reasons of learning and understanding and show intrinsic interest in the academic tasks are found to get higher science grades. On the other hand, students studying for the reasons of demonstrating their abilities to others and looking smart are likely to get lower science grades. In addition, results suggested that there are positive relationships among all of the motivational belief variables. In other words, self-efficacious students in science are found to be more likely to have intrinsic interest in science and have higher levels of

mastery and performance goals. Moreover, students with higher levels of intrinsic value are found to adopt mastery and performance goals. Additionally, findings revealed a positive relationship between mastery and performance goals.

CHAPTER 6

DISCUSSION

This chapter presents the summary of the study, conclusions and discussions of the results, internal and external validity of the study, implications of the study and finally recommendations for further studies.

6.1 Summary of the Study

In order to investigate the effects of students' grade level on their motivational beliefs and the relationships between students' science grades and their motivational beliefs, Turkish version of the Approaches to Learning Instrument (ALI) and the Motivated Strategies for Learning Questionnaire (MSLQ-TV) were administered to 900 elementary school students (299 sixth grade, 299 seventh grade, 302 eighth grade) randomly selected from Bolu region.

6.2 Conclusions and Discussions of the Results

The results of the present study revealed that students' grade level has a significant effect on their motivational beliefs (self-efficacy, intrinsic value, mastery goals and performance goals). More specifically, the findings indicated that 6^{th} grade students feel more self-efficacious and they show

more intrinsic interest in science and study science course for the reasons of learning and mastering as well as showing their abilities to others compared to 7th grade and 8th grade students. Concerning the motivational level of 7 and 8 graders, results also showed that 7 graders' motivational beliefs are more favorable than 8 graders. These results suggested that students' motivation in science decreases as their grade level increases (see Table 5.6, Table 5.7, and Figure 5.1). In other words, the findings implied that as the elementary school students become older, their motivation in science gets less favorable. These results are in comparable with the findings in the related literature (Eccles et al., 1993; Lepper, Corpus & Iyengar, 2005; Metallidou and Vlachou, 2007). For example, similar to the findings of the present study, Eccles et al. (1993) found a decrease in pre-elementary school students' competence beliefs and task value beliefs over time. Recently Güvercin (2008) also found a decrease in students' self-efficacy beliefs . More specifically, 6th grade students' self-efficacy scores (M=3.71, SD=0.84) were found to be higher than 8th grade students' self-efficacy scores (M=3.53, SD=0.76). Similarly, Lepper, Corpus and Iyengar (2005) reported significant linear decrease in students' intrinsic motivation and very little change in their extrinsic motivation from 3rd grade through 8th grade. The researchers attributed the decrease in students' intrinsic motivation to decontextualization of learning situation which causes students to feel that what they learn in the classroom becomes less relevant to and useful in their daily lives. Additionally, the researchers stated that the increased school control over students' learning and providing less opportunity for students to make choices and feel autonomous in their learning lead to decrease in student motivation over time. According to Wigfield and Eccles (1994) the reason for the decline in students' motivation can be students' increasing interests to nonacademic activities like social and sport activities rather than academic activities as their grade

level increases. Indeed, Otis, Grouzet, and Pelletier (2005) suggested that for students, at their transition period from junior high school to senior high school, going to school become less important compared to attending nonacademic activities. Actually, in the literature the observed decline in student motivation is attributed to two main sources. Firstly, use of Likert type self-reports instruments to assess students' motivational beliefs is considered to be one of the reasons for finding a decline in student motivation. According to Pintrich and Schunk (2002), young students are likely to use only endpoints of the Likert scale and are tend to overestimate their abilities. However, as they get older, they more realistically assess themselves and start to use all points across the continuum of the scale, causing a general mean level decline. Secondly, the mismatch between students' abilities and instructional strategies used in the classrooms and emphasis on normative based assessments and competition might have resulted in a decline in students' motivation. Indeed, as students get older, they begin not only to move away from their families and academic activities but also compare themselves with others (Bronson, 2000). As a result, they tend to evaluate their performance relative to others rather than monitoring their own progress. The competition emphasized in the classrooms can foster this situation. In addition to this, instructional strategies and activities which do not match with students' abilities can lead to decline in motivation. Accordingly, in the present study the observed decline in student motivation can be attributed to Turkish educational system which is highly competitive and exam oriented. Indeed, at the end of this semester when the data of this study were collected 8th grade students entered to high school entrance examination. All the students and their families aimed to succeed at this study and enter a 'Science High School' or 'Anatolian High School' which are more prestigious and successful schools than public schools. Therefore, 7th and especially 8th grade students

concentrated on this exam and they programmed all their school work and learning activities to become successful on this exam. To achieve this, students targeted to memorize so much information and focused on solving multiple choice questions. So, this resulted with less meaningful learning. Families and school teachers encouraged this situation to facilitate the students' entrance to these prestigious schools. This situation lessened students' motivation towards school and their achievement level not only in science but also in other subject domains. At this point it should be noted that starting with 2008 academic year, high school entrance examination system was changed and elementary students began to take an exam at the end of each educational year and their average score was started to be used for entrance of a 'Science High School' or 'Anatolian High School.' Therefore, there is need for conducting comprehensive studies to examine the long-term effects of the new exam system on students' motivation. Especially, longitudinal studies will be helpful to investigate the change in students' motivation over time. In the present study, cross-sectional research design was used, however future studies should use a longitudinal design.

Another important outcome of the study revealed significant relationships between students' motivational beliefs (self-efficacy, intrinsic value, mastery goals and performance goals) and their science grade. More specifically, students' science grade is found to be positively correlated with their three of the motivational beliefs (self-efficacy, intrinsic value, and mastery goals) for all grade levels. However, students' science grade has non-significant negative correlation with their performance goals for 7^{th} and 8^{th} grade levels, and it has significant negative correlation with their performance goals for 8^{th} grade level. Similarly, Uguroğlu and Walberg (1979) found a significant positive correlation between motivation and achievement in their study, and they concluded that this positive correlation become stronger at their later grades. Similar with this study, Kremer and

Walberg (1981) reported a positive correlation between students' motivational beliefs and their science learning. Beside these, Greene et al. (2004) reported significant positive relationships between motivational variables and achievement. In that study, mastery goal orientation had the strongest positive correlation with achievement; however, performance-approach goals were not related to achievement. Also, it was found that achievement was significantly linked to self-efficacy. Moreover, the study conducted by Özkan (2003) showed that there was a strong positive correlation between biology achievement and self-efficacy (r=.179), intrinsic value (r=.143) and test anxiety (r=.166). More recently, Taş (2008) reported a significant positive correlations between 7th grade students' science achievement and their both self-efficacy and mastery goals. In addition to this, she reported that science achievement was not significantly correlated with performance-approach goals.

When these studies reviewed, it is generally observed that students' motivational beliefs are positively correlated with their achievement. In current study, students' self-efficacy, intrinsic value and mastery goals positively correlated with their science grade for all 6th, 7th and 8th grade levels. Moreover, significant positive correlations were found among motivational belief variables. These results indicate that students' judgments about their ability to perform effectively in science classes, their interest in science, and their goal orientations are all related with each other. Therefore, students who feel self-efficacious in science learning are also found have intrinsic interest in science and study for the reasons of learning, mastering and getting higher grades. These students also found have higher science grades. Additionally, intrinsic interest is found to be positively related to goal orientations. All these findings are compatible with related theory and the findings in the related literature: self-efficacy is positively linked to academic performance and students with higher levels of self-efficacy tend

to put greater effort in their learning and show persistence in the face of difficulties (Hoy, 2004). Moreover, Sungur (2007b) demonstrated that self-efficacy and intrinsic value is positively associated with mastery goal orientation.

Therefore, for a better science teaching and learning; researchers, educators and teachers should be aware of the role of motivation in students' academic performance and investigate the factors influencing the students' motivational beliefs to be able to suggest ways to improve these beliefs.

6.3 Internal Validity of the Study

Classroom environment perceptions, family involvement, and socioeconomic status are some subjects characteristics that may influence the internal validity of the study. Location threat was tried to be eliminated by ensuring administration of the instruments to all participants under similar conditions. Moreover, data-collector bias is assumed to be controlled by training and informing the teachers about the application of standard procedures during data collection. Additionally, instrument decay is not considered to be a threat to the internal validity due to the use of Likert type instruments which involve objective scoring.

6.4 External Validity of the Study

In the present study, since the random selection of the participants was not feasible, the schools involved in the study were randomly selected to improve external validity of the study. Therefore, the degree of the generalizability of the findings, which is obtained from 900 elementary

students from randomly selected schools, to the environment outside the research setting, is assumed to be reasonable.

6.5 Implications of the Study

Results of this study have some implications and suggestions for educators and researchers. First of all, teachers and educators should be aware of the vital importance of motivation in students' achievement. Accordingly, they should create learning environments conductive to student motivation. Since, in the present study, students' self-efficacy beliefs, intrinsic value, and mastery goal orientation were found to be positively linked to students' science grades, classroom environments should help development of these adaptive motivational beliefs. In order to do so, science classes designed so that students can realize real life applications of they have learned in the school and should feel autonomous in their learning. Beside these, field works, projects, laboratory experiments and simulations may be used as instructional activities for increasing students' motivations towards lesson. Also, brainstorming, group working, problem-solving and cooperative learning may also be used to increase student motivation. They should be able to feel that they have control over their learning, and effort is the main reason of their success. They should be able to realize their own progress over time, rather than being compared with other students. In such classroom environments, students' beliefs about their abilities to learn and perform effectively can be enhanced and they can start to perceive the course content as important and useful, and study for the reasons of learning and understanding. Designing such classroom environments emphasizing individual progress rather than competition in all grade levels can also help prevent the decrease in students' motivation over time.

6.6 Recommendations for Further Research

Current study has suggested several useful topics for further research. These are briefly as follows:

1. Longitudinal studies can be conducted to examine the changes in students' motivational beliefs over time.
2. The role of classroom environment perceptions and parental involvement in students' motivational beliefs can be examined
3. The effect of different instructional methods on motivational beliefs can be investigated.
4. Further research can examine the gender differences in motivational beliefs.
5. This study can be extended by including high school students (9^{th}, 10^{th} and 11^{th} graders) to investigate the changes in students' motivational beliefs both during transition period from elementary school to high school and during high school period.

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APPENDICES

APPENDIX A

TURKISH VERSION OF THE APPROACHES TO LEARNING INSTRUMENT (ALI) AND MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE (MSLQ-TV)

Sevgili Öğrenci,

İlköğretim öğrencilerinin Fen Bilgisi dersindeki davranış ve inançlarını belirlemek amacıyla bir araştırma yapılmaktadır. Bu nedenle sizlerin görüşlerinin alınmasına gerek duyulmuştur. Birinci bölümde sizinle ilgili kişisel bilgileri doldurmanızı istiyoruz. Diğer bölümlerde ise fen bilgisi dersindeki öğrenci davranış ve inançlarına yönelik bir dizi ifade bulunmaktadır. Bu ifadelere ne ölçüde katıldığınızı belirtmek için uygun rakamı yuvarlak içersine alınız.

Kesinlikle Katılmıyorum	Katılmıyorum	Katılıyorum	Kesinlikle Katılıyorum
1	2	3	4

Araştırma sonuçları kesinlikle gizli tutulacaktır. Araştırmanın amacının gerçekleşmesi cevaplarınızın içtenliğine ve soruları eksiksiz olarak cevaplamanıza bağlıdır.

Çalışmaya katıldığınız için teşekkürler.

SAVAŞ GÜNGÖREN

Bolu Dağkent Kıroğlu Esv İöo Fen ve Teknoloji Öğretmeni

Orta Doğu Teknik Üniversitesi Yüksek Lisans Öğrencisi

1. Bölüm:
Kişisel Bilgiler

Okulunuzun adı :----------

Öğretmeninizin adı : ----------

Sınıfınız : ❑ 6 ❑7 ❑ 8

Şubeniz : ❑ A ❑ B ❑C ❑D ❑E ❑F ❑G ❑H ❑------

Cinsiyetiniz : ❑ Kız ❑ Erkek

Yaşınız : _____

Fen dersinizin geçen dönemki karne notu nedir? _____

2. Bölüm:

		Kesinlikle Katılmıyorum	Katılmıyorum	Katılıyorum	Kesinlikle Katılıyorum
1	Yeni şeyler öğrenebilmem için, uğraş gerektiren sınıf çalışmalarını tercih ediyorum.	1	2	3	4
2	Sınıftaki diğer öğrenciler ile karşılaştırıldığında, başarılı olmayı beklerim.	1	2	3	4
3	Fen Bilgisi dersinde anlatılanları öğrenmek benim için önemlidir.	1	2	3	4
4	Fen Bilgisi dersinde öğrendiklerimden hoşlanıyorum.	1	2	3	4
5	Fen Bilgisi dersinde öğretilen konuları anlayabildiğime eminim.	1	2	3	4
6	Fen Bilgisi dersinde öğrendiklerimi başka derslerde kullanabileceğimi düşünüyorum.	1	2	3	4
7	Fen Bilgisi dersinde başarılı olmayı umuyorum.	1	2	3	4
8	Sınıftaki diğer öğrenciler ile karşılaştırıldığında, iyi bir öğrenci olduğumu düşünüyorum.	1	2	3	4
9	Daha fazla çalışma gerektirmesine rağmen, bir şeyler öğrenebileceğim ödev konularını sıklıkla seçiyorum.	1	2	3	4
10	Fen Bilgisi dersi için belirlenen görevleri ve problemleri en iyi şekilde yapabileceğime eminim.	1	2	3	4
11	Fen Bilgisi dersinden iyi bir not alacağımı düşünüyorum.	1	2	3	4

12	Bir sınavdan zayıf alsam bile, hatalarımdan öğrenmeye çalışıyorum.	1	2	3	4
13	Bu derste öğrendiklerimin, benim için gerekli olduğunu düşünüyorum.	1	2	3	4
14	Sınıftaki diğer öğrenciler ile karşılaştırıldığında, çalışma becerilerim mükemmeldir.	1	2	3	4
15	Fen Bilgisi dersinde öğrendiklerimin ilginç olduğunu düşünüyorum.	1	2	3	4
16	Sınıftaki diğer öğrenciler ile karşılaştırıldığında, fen konuları hakkında fazla bilgiye sahip olduğumu düşünüyorum.	1	2	3	4
17	Fen Bilgisi dersinde verilen bilgileri öğrenebileceğimi biliyorum.	1	2	3	4
18	Fen konularını anlamak benim için önemlidir.	1	2	3	4

3. Bölüm:

		Kesinlikle Katılmıyorum	Katılmıyorum	Katılıyorum	Kesinlikle Katılıyorum
19	Bu dersteki etkinliklere katılıyorum çünkü bu derste sunulan bilgi ve becerileri anlama yeteneğimi geliştirmek istiyorum.	1	2	3	4
20	Bu dersteki etkinliklere katılıyorum çünkü bu derste sunulan bilgi ve becerileri öğrenmekten hoşlanıyorum.	1	2	3	4

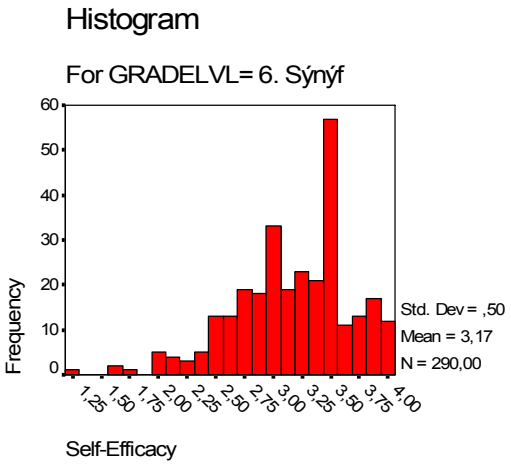
21	Bu dersteki etkinliklere katılıyorum çünkü yeni bilgi ve beceriler öğrenmek istiyorum.	1	2	3	4
22	Bu dersteki etkinliklere katılıyorum çünkü bu derste sunulan bilgi ve becerileri öğrenmek zevklidir.	1	2	3	4
23	Bu dersteki etkinliklere katılıyorum çünkü yeni bilgi ve becerileri öğrenmekten hoşlanıyorum.	1	2	3	4

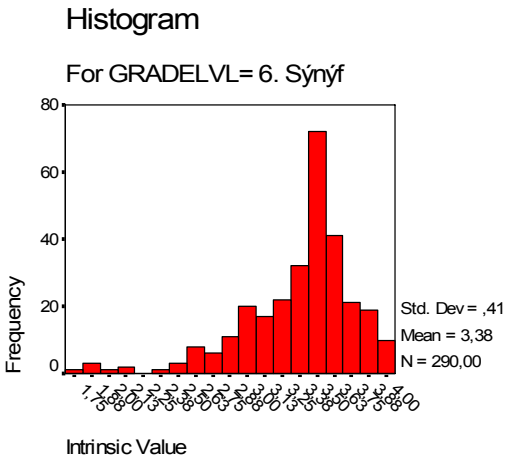
4. Bölüm:

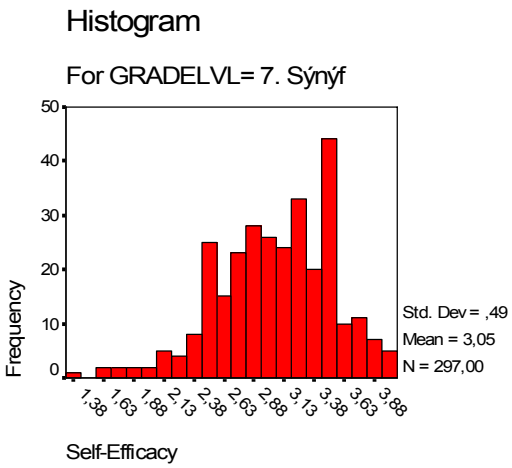
		Kesinlikle Katılmıyorum	Katılmıyorum	Katılıyorum	Kesinlikle Katılıyorum
24	Bu dersteki etkinliklere katılıyorum çünkü diğer öğrencilerin benim akıllı olduğumu düşünmelerini istiyorum.	1	2	3	4
25	Bu dersteki etkinliklere katılıyorum çünkü diğer öğrencilerden daha iyi notlar almak istiyorum.	1	2	3	4
26	Bu dersteki etkinliklere katılıyorum çünkü diğer öğrencilere akıllı gözükmek istiyorum.	1	2	3	4
27	Bu dersteki etkinliklere katılıyorum çünkü diğer öğrencilerden daha başarılı olmak istiyorum.	1	2	3	4

APPENDIX B

HISTOGRAMS FOR EACH VARIABLES WITH RESPECT TO GRADE LEVEL



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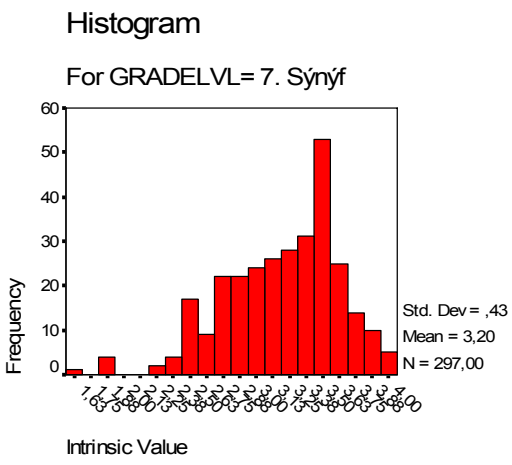
Frequency
Std. Dev = ,49
Mean = 3,05
N = 297,00
Self-Efficacy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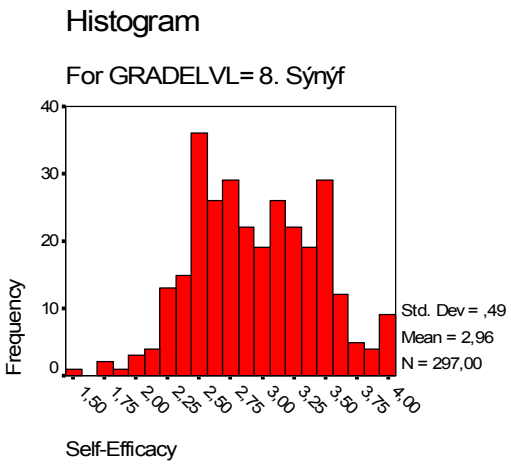
Frequency
Std. Dev = ,43
Mean = 3,20
N = 297,00
Intrinsic Value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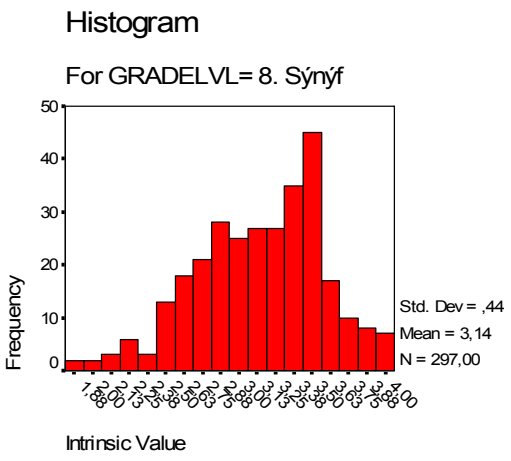
Self-Efficacy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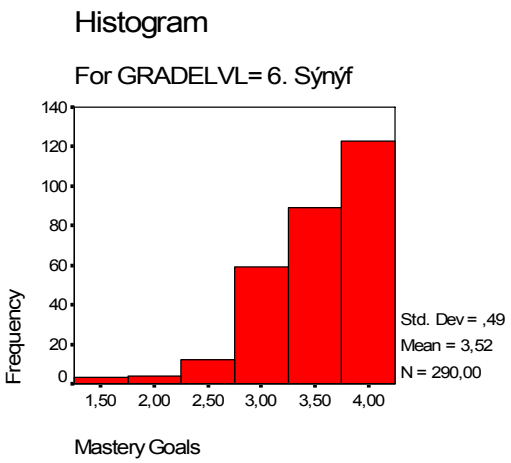
N = 297,00
Intrinsic Value


Histogram
For GRADELVL= 6. Sýnýf
Frequency
140
120
100
80
60
40
20
0
1,50
2,00
2,50
3,00
3,50
4,00
Std. Dev = ,49
Mean = 3,52
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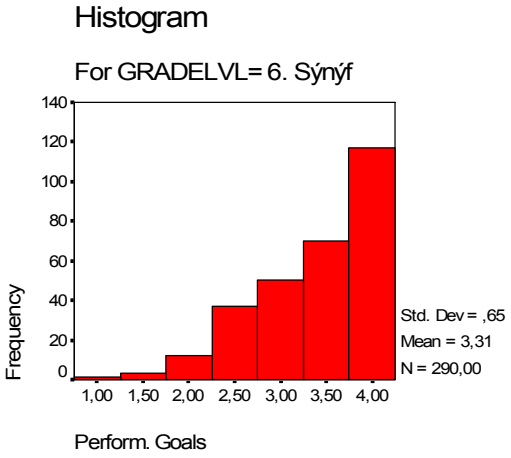
Mastery Goals


Histogram
For GRADELVL= 6. Sýnýf
Frequency
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100
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60
40
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1,50
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2,50
3,00
3,50
4,00
Std. Dev = ,65
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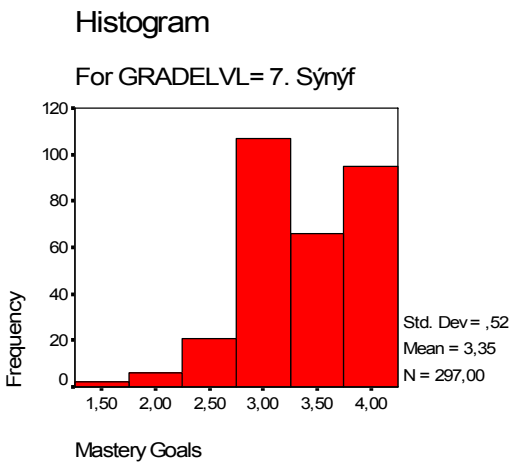
Perform. Goals


Histogram
For GRADELVL= 7. Sýnýf
Frequency
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100
80
60
40
20
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2,50
3,00
3,50
4,00
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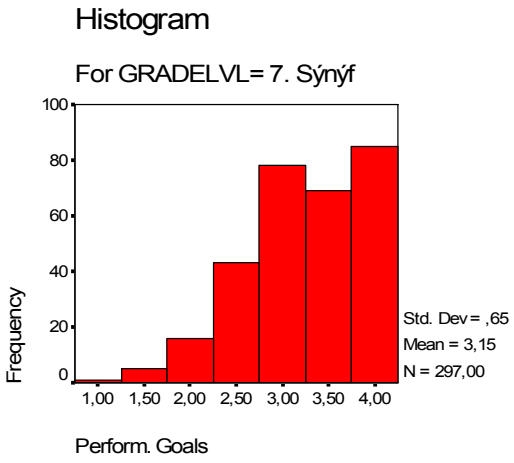
Mean = 3,35
N = 297,00
Mastery Goals


Histogram
For GRADELVL= 7. Sýnýf
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60
40
20
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1,00
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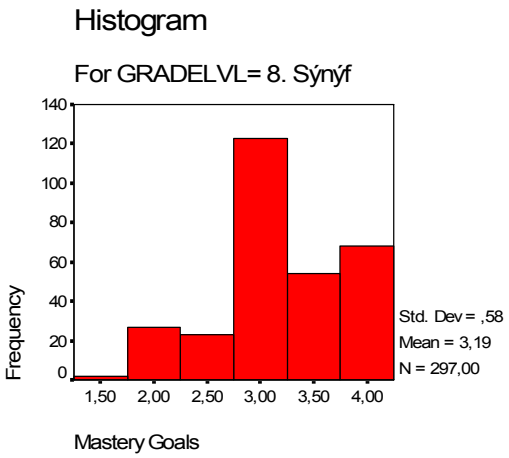
3,50
4,00
Std. Dev = ,65
Mean = 3,15
N = 297,00
Perform. Goals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For GRADELVL= 8. Sýnýf
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40
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4,00
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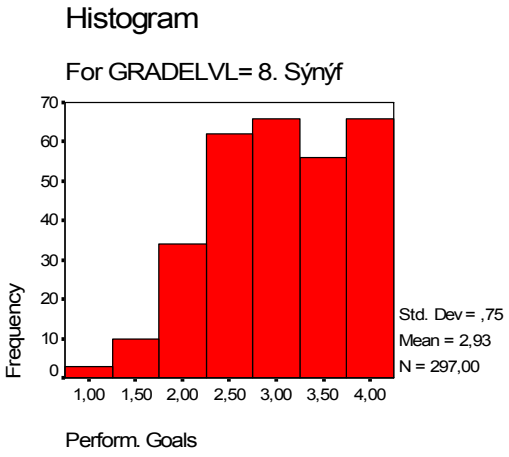
N = 297,00
Mastery Goals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For GRADELVL= 8. Sýnýf
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50
40
30
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10
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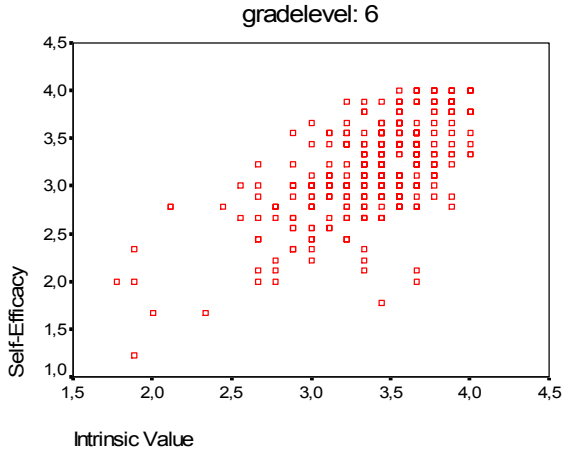
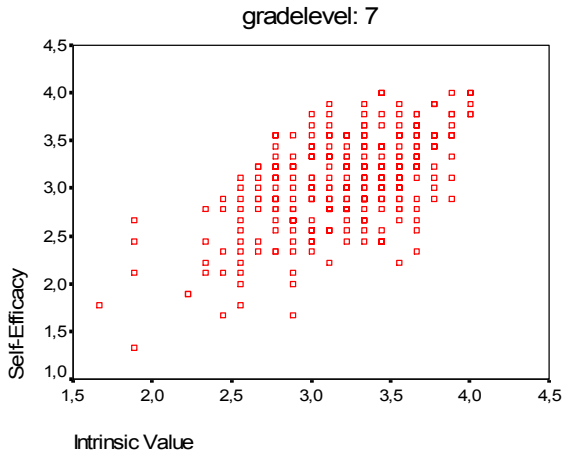
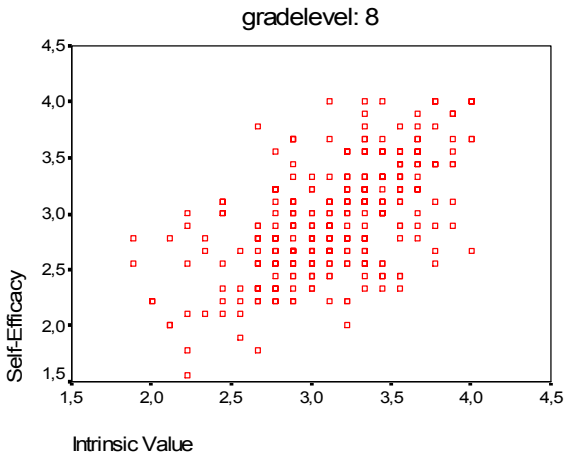
1,00
1,50
2,00
2,50
3,00
3,50
4,00
Std. Dev = ,75
Mean = 2,93
N = 297,00
Perform. Goals

APPENDIX C

SCATTER PLOTS FOR EACH VARIABLES WITH RESPECT TO GRADE LEVEL



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Self-Efficacy
Intrinsic Value
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1,5
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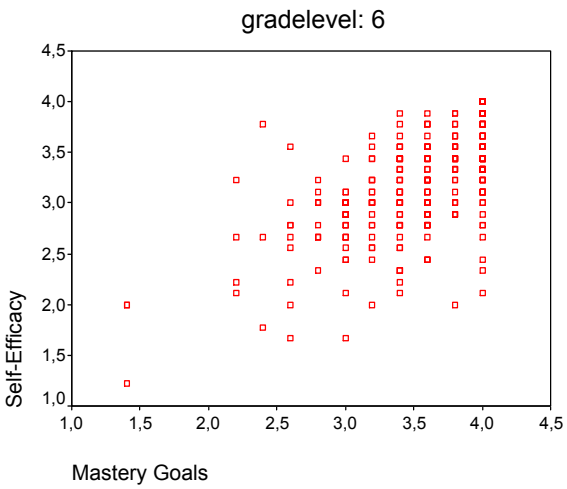
2,0
2,5
3,0
3,5
4,0
4,5


gradelevel: 6
Self-Efficacy
Mastery Goals
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
1,0
1,5
2,0
2,5
3,0
3,5
4,0
4,5


gradelevel: 7
Self-Efficacy
Mastery Goals
4,5
4,0
3,5
3,0
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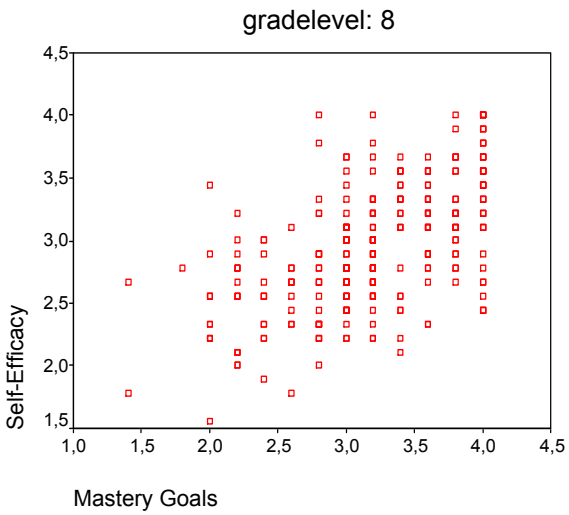
3,0
3,5
4,0
4,5


gradelevel: 8
Self-Efficacy
Mastery Goals
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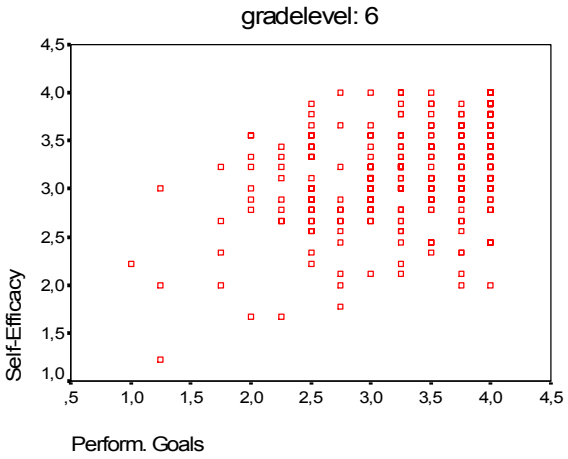
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Self-Efficacy
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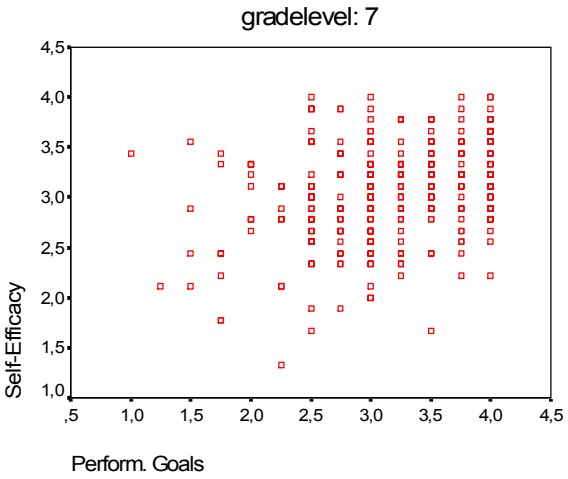
Perform. Goals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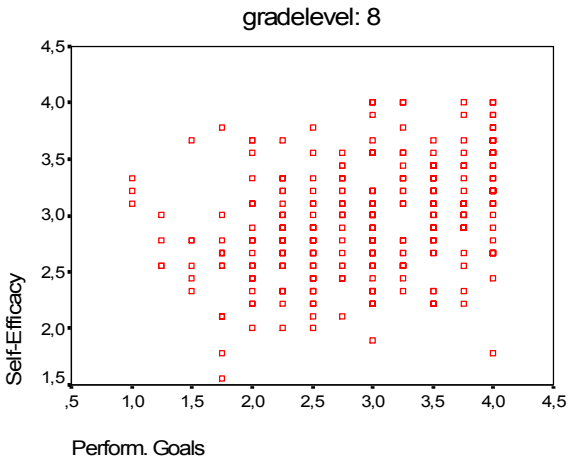
Perform. Goals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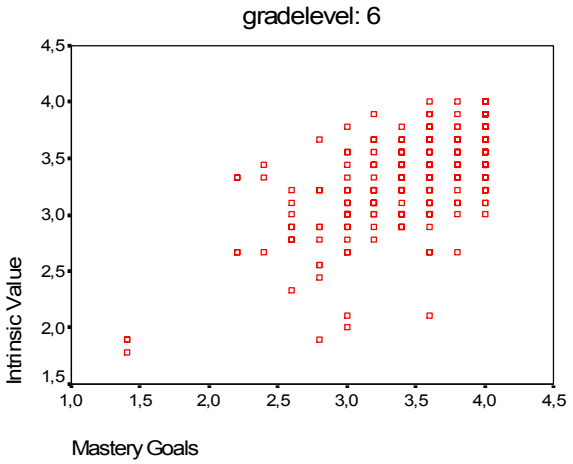
Perform. Goals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Intrinsic Value
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2,5
3,0
3,5
4,0
4,5
Mastery Goals


gradelevel: 7
Intrinsic Value
4,5
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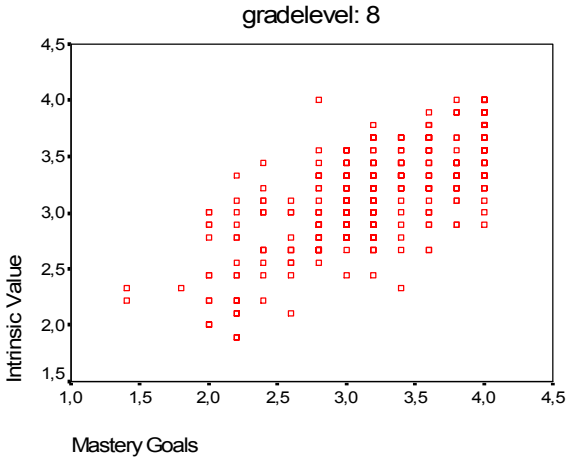
Mastery Goals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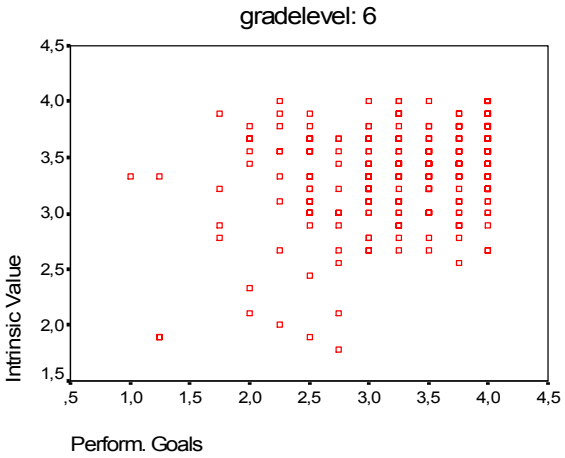
Mastery Goals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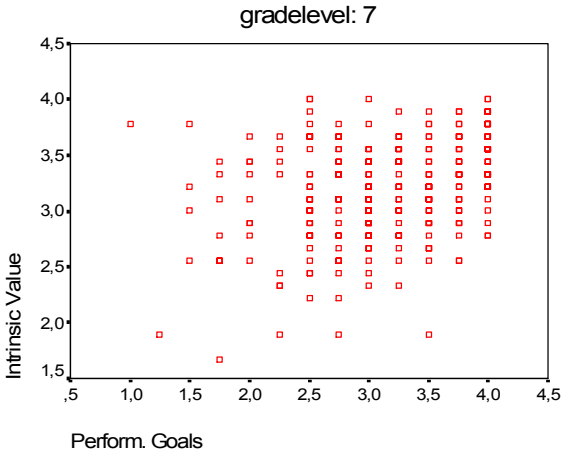
Perform. Goals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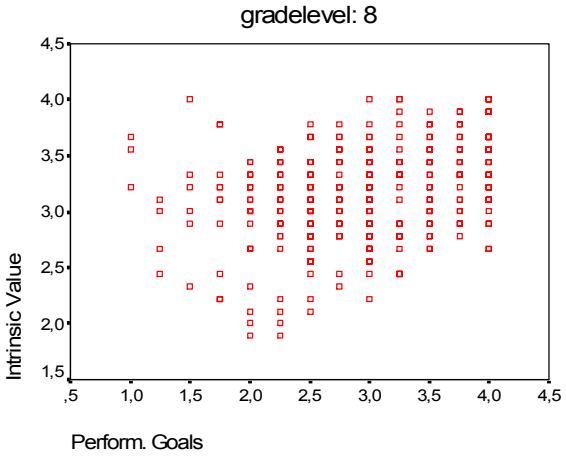
Perform. Goals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Intrinsic Value
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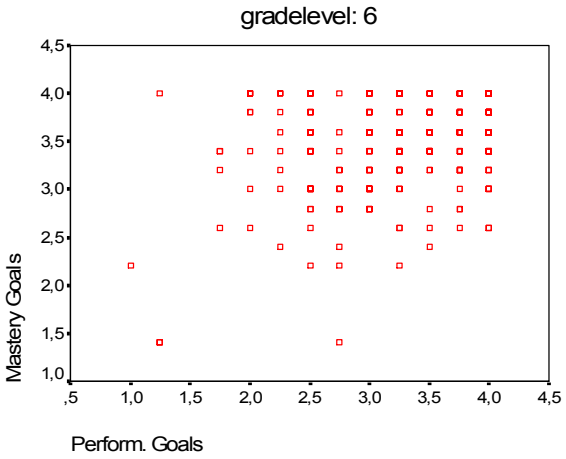
Perform. Goals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Mastery Goals
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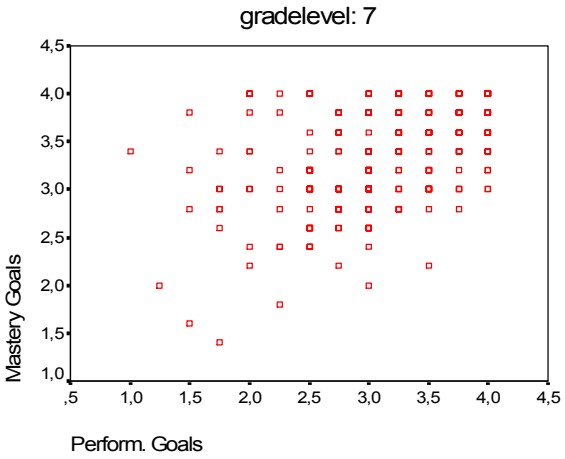
Perform. Goals


gradelevel: 7
Mastery Goals
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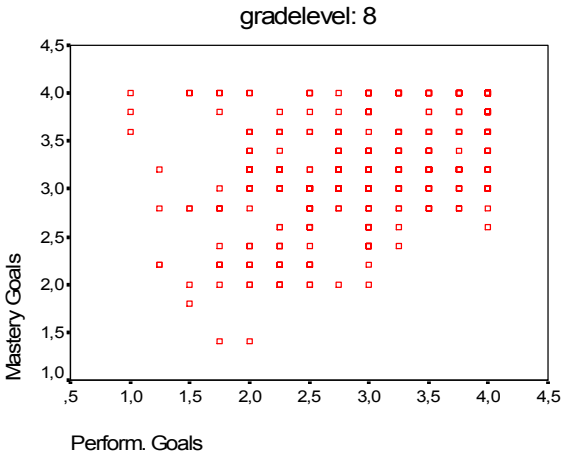
Perform. Goals


gradelevel: 8
Mastery Goals
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4,5
Perform. Goals