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Investigation of fourth grade primary school students' self-regulated learning strategies and successes in mathematics course in terms of socio-economic level

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Abstract

This study aimed to determine fourth grade primary school students' self-regulated learning strategies and successes in mathematics course in terms of socio-economic level. A cross-section scanning model was used in the study. The sample of the study was determined by the random sampling technique. The sample consisted of 65 students studying in 2 official primary schools in Gaziantep province. The data of the research were collected with the "Self-Regulated Learning Strategies Scale in Mathematics", which was developed by Aktan and Tezci (2012), and the "Demographic Form". The results of the study are as follows: There was no significant difference between the fourth grade primary school students' total and sub-dimension scores of the Self-Regulated Learning Strategies Scale in Mathematics, and the income level of their families and the education level of their parents. It was determined that those students whose parents were high school and university graduates were more successful in mathematics

Keywords: Primary school; self-regulated learning; student.

1. Introduction

Self-regulated learning (SRL) influences the learning process of students and has a significant impact on students' learning of subject matter covered in classes. The degree to which primary school students achieve abilities to self-regulate their learning are of great importance with regard to their learning of skills within cognitive, affective and

of fourth grade primary school students.

The use of self-regulated learning in primary school students in mathematics classes affects their effective use of strategies, methods, techniques, and materials, and has an impact in terms of their ability to make effective decesions the right choices. Another important variable in their success within a mathematics course is their self-regulated

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learning skills. SRL has been linked to several research areas, including achievement goals, intrinsic motivation, action control, assessment processes, autonomy in goal setting, self-determination, and use of cognitive or metacognitive strategies (Meece & Painter, 2008). Self-regulation is based on social cognitive theory and guides environmental conditions that encourage individuals to adopt, develop, improve, monitor and evaluate strategies (Hadwin et al., 2011). SRL refers to the capacity of organisms to nullify and modify their response. Self-regulation is the process by which people try to limit their unwanted impulses to gain control of their initial response (Baumeister & Vohs, 2007). SRL can be defined as the processes by which emotional and cognitive arousal is maintained, which promotes positive adjustment and helps the individual develop a positive sense of competence, agency, and self-worth (Luu & Tucker, 2004).

Boekaerts et al. (2005) defined self-regulated learning as a repetitive, multi-component process that targets and determines one's own cognition and emotions in harmony with the environment. Through the selective use of metacognitive and motivational strategies, self-regulated learning play an important role in students' ability to personally develop their learning abilities, to choose appropriate learning environments, and to structure, create, and determine the type and amount of instruction they need (Zimmerman, 1989).

SRL not only guides students' own learning during educational processes, but also makes a great contribution to improving themselves and their current knowledge after leaving school (Boekaerts, 1999). SRL includes a high level of self-awareness and the ability to monitor one's own learning and performance (Van Etten et al., 1997). SRL includes strategies for studying for an exam, monitoring comprehension of a lesson, and self-testing using questions about text material to check comprehension (Ruban et al., 2003). Students with sufficiently developed self-regulated learning skills are autonomous, reflective and efficient learners, and have cognitive and metacognitive abilities as well as motivational beliefs and attitudes needed to understand, monitor and direct their own learning (Wolters, 2003).

Self-regulated learners actively avoid behaviors and cognitions that harm academic achievement. Self-regulated learners know the strategies necessary for learning to take place, and are aware of when and how to use strategies that increase perseverance and performance (Byrnes et al., 1999). Self-regulated learners view learning as a controllable process. During this process, they continuously plan, organize, monitor and evaluate their learning (Ley & Young, 1998). Students with self-regulated learning skills try their learning strategically, making detailed arrangements over time and between tasks (Winne & Hadwin, 2008).

Both cognitive constructivists and a significant number of Vygotskians claim that students develop self-regulation capacity during primary school years (McCaslin & Hickey, 2001). Flavell (1979) attributes limitations in young children's metacognitive functioning to their inability to self-regulate during learning. The development of self-regulation

begins in early childhood (Eisenberg et al., 2004; Whitebread et al., 2007). The general maturation or age-related changes of fourth grade primary school students enable them to coordinate their thoughts and behaviors in different areas of life (Best et al., 2011). Veenman et al. (2006) state that metacognitive skills emerge between the age of eight and ten. Rothbart et al, (2006) reviewed the evidence linking the early emergence of various functions, such as effortful control and executive attention, with self-regulation in children up to 6 years of age.

Schneider and Pressley (1997) determined that there was a relationship between memory, monitoring and performance in preschool children. Emotions, motivation, and metacognition deal with the content of science, technology, engineering, and mathematics (STEM). In addition, these elements play an important role in students' ability to monitor and organize their learning (Efklides, 2011; Gabriel et al., 2020). Pekrun (2021) also stated that emotion and motivation constituted the important structure of self-regulation. It is thought that emotions affect students' intrinsic learning motivation (Mega et al., 2014).

Emotions are at the center of how efficiently students can regulate their own learning and to what extent they can affect their motivation (Efklides, 2011; Gabriel et al., 2020). In STEM, there are research results showing that mathematics-specific motivational beliefs are a very important filter factor in career decision making (Watt et al., 2017).

Self-regulated learning (SRL) is central to problem solving, reasoning and understanding complex issues (Panadero, 2017). There are many empirical research findings that SRL plays an important role in success at school (Greene, 2018). Experimental research showed that students exhibiting high levels of SRL were more determined to learn than students with low levels of SRL (Wolters & Hussain, 2015; Zimmerman & Schunk, 2008). Ponitz et al, (2008) noted that young children's self-regulation, including executive control, attention, emotion regulation, and behavior regulation, is associated with effective classroom behavior and high achievement, and reviewed the evidence identifying poor self-regulation as an indicator of future problems at school. In a longitudinal study of 3-5-year-old children living in low-income households in the United States, Blair and Razza (2007) determined that early math and reading ability was uniquely predicted by various aspects of self-regulation and executive control. Luo and Gao (2022) stated that the socio-economic level of a family consisted of father's education, mother's education and family income.

Self-regulated learning has a relationship with academic performance, academic motivation and learning (Zimmerman, 2000). Perry (1998) observed 2nd and 3rd grade students, and found that classes exhibiting high levels of self-regulated learning were more active in challenging and open-ended activities. Self-regulation processes and beliefs, such as goal setting, strategy use, and self-assessment, can be learned from instruction and

models given by parents, teachers, coaches, and peers. Students with advanced self-regulation skills seek help from others to improve their learning (Zimmerman, 2002).

First, self-regulation of learning involves more than detailed knowledge of a skill. Self-awareness, self-motivation, and behavioral skill are required to apply this knowledge appropriately. Second, self-regulation of learning is not a single trait that individual learners have or lack. Third, self-regulated learners' self-motivation quality was found to be enhanced by several core beliefs, including perceived effectiveness and intrinsic interest. It was determined that a student's learning level changed depending on the presence or absence of these key self-regulation processes (Schunk & Zimmerman, 1994; 1998; cited in Zimmerman, 2002).

Self-regulated learning processes (for example, goal setting, planning and reflection) have been recognized as a core 21st-century skill, and are increasingly incorporated into national curriculum standards and qualifications (Anderson-Koenig, 2011; White & DiBenedetto, 2018). The assessments made by the Program for International Student Assessment (PISA), and the Organization for Economic Cooperation and Development (OECD) are the international assessments. Since 2000, PISA has been implemented every three years. Assessment covers main areas such as reading, mathematics and scientific literacy, which are used alternately (Lau & Ho, 2016). Learning to learn is the ability to pursue learning and to insist on it. In addition, this learning includes the individual's own learning action, effective time and information management (Milli Eğitim Bakanlığı [MEB], 2018).

Mathematics is at the center of everything scientific (Cowan, 2006). Mathematics is a body of knowledge and a set of skills that can be taught and learned. It consists of patterns and relationships that need to be learned. It is the application of rational and logical argument to specific ideas and systems using precise rules. Mathematics is creative, and requires activity involving imagination, intuition and exploration. It is a problem solving method based on the application of general strategies to knowledge and skills. It is a way of conveying information and ideas (Brown, 1998). The Primary School Mathematics Curriculum consists of four learning areas: Numbers and Operations, Geometry, Measurement and Data Processing. While all learning areas are included at every grade level, some sub-learning areas are taught after a certain grade (Milli Eğitim Bakanlığı [MEB], 2018).

In this study, many studies measuring self-regulated learning skills were conducted in the related literature. An important part of the research concerns the change in self-regulation skills of university students. The research is important in terms of the fact that the study is the first in the literature, that it is an original and up-to-date study, and that the data obtained contributes to the relevant literature. In the study, it will be determined

whether self-regulated learning strategies in mathematics are affected by variables such as parents' educational status and mathematics course success.

Self-regulated learning strategies in mathematics are important because it will be determined whether the parents' educational status is affected by the variables of mathematics course success. The results of this research will provide data to teachers working in primary school, to the authorities of the Ministry of National Education, and to those who will conduct research on this subject.

The general purpose of this study is to determine the self-regulated learning strategies, mathematics course successes and socio-economic levels of fourth grade primary school students in mathematics course. The question sought to be answered in this study is that: Do fourth grade primary school students' success in mathematics, total scores of self-regulated learning strategies in mathematics course, and total sub-dimension scores differ according to the monthly income of their families and the educational status of their parents?

2. Method

2.1. Research design

In this study, a cross-sectional screening design was used to determine whether the variables of family income per month, parents' educational status, and self-regulated learning strategies in mathematics course could be determined by considering the total and sub-dimension scores of students studying in public primary schools (Creswell, 2012). In order to achieve the general purpose of the study and to get answers to the questions in the sub-problems, it was thought that the most appropriate design was the cross-sectional screening design.

2.2. Participant (subject) characteristics

The population of participants of this research consisted of this research consists of students studying in the fourth grade of official primary schools in Gaziantep province. The sample of the study, on the other hand, consists of a total of 65 students, 35 girls and 30 boys, studying in the fourth grade of two public primary schools in Gaziantep, determined by the simple random sampling technique (Creswell, 2012).

Table 1. Percentage of students' self-regulated learning strategies in mathematics course, mathematics course success, and socio-economic levels

Variables		f	%
Mothers' Educational Status	Illiterate	12	18.5
	Primary school	21	32.3
	Secondary School	13	20.0
	High school	16	24.6
	Vocational School	2	3.1
	University	1	1.5
Fathers' Educational Status	Illiterate	5	7.7
	Primary school	15	23.1
	Secondary School	16	24.6
	High school	23	35.4
	Vocational School	5	7.7
	University	1	1.5
Family Income per Month	4000-6000 Turkish liras	48	73.8
	6001-8000 Turkish liras	11	16.9
	8001-10000 Turkish liras	1	1.5
	10001-12000 Turkish liras	1	1.5
	Other	4	6.2

2.3. Measures and covariates

Self-regulated learning strategies scale in mathematics: The Self-Regulated Learning Strategies Scale, one of the sub-dimensions of the Motivated Strategies for Learning Questionnaire, was adapted into Turkish by Aktan and Tezci (2012) to determine the self-regulated learning strategies used by primary school students in mathematics course. Confirmatory factor analysis was performed for the reliability study of the scale. The internal consistency coefficient of this scale is between .74 and .91. The item-total correlation values were determined as .32 and .82. The sub-dimensions of this scale are as follows: time and study environment (6 items), help seeking (3 items), peer learning (3 items), rehearsal (4 items), organization (4 items), effort regulation (4 items), elaboration (6 items) and metacognitive self-regulation (10 items) (Aktan & Tezci, 2012).

Mathematics Course Success: It consists of the grades of mathematics course during the 2021-2022 fall semester, based on the students' own expressions. The students' achievements range from 0 to 100 points.

Demographic Form: This form consists of questions about the gender, age, and parental education status of the students studying in the fourth grade of primary school, and the

grades of their respective marks within their mathematics course at the end of the first semester.

2.4. Data collection

The ethics committee approval of the study was obtained with the decision of the Ethics Committee of the School of Graduate Studies of Çanakkale Onsekiz Mart University (Date: 28.04.2022; No: 09/01). In order to carry out the research, firstly, official permission was obtained from Gaziantep Governorship and Gaziantep Provincial Directorate of National Education. In addition, written permission was obtained from the parents of the fourth grade primary school students with the "Parent Consent Form". The data of this research were collected in the spring term of 2021-2022 with the "Self-regulated learning strategies scale in mathematics" and the "Demographic form".

2.5. Analysis of data

In this study, the SPSS 26.00 statistical package program was used, based on the sum of the total scores obtained from the self-regulated learning strategies scale in mathematics, and the arithmetic averages of the data belonging to the sub-dimension total scores and mathematics course successes for performing statistical operations.

The Kolmogorov-Smirnov test (Mertler & Reinhart, 2017), which is a prerequisite for parametric tests, was conducted to determine the normality distribution before the statistical processes of the research were performed. A significant difference was found in the total scores of the self-regulated learning strategies scale in mathematics and the total scores of the sub-dimensions ($p < 0.01$). The Kruskal-Wallis H test (KWH) was used because the data used in this study did not meet the normal distribution conditions.

The non-parametric (KWH) test (Miller, 2009) was used because the fourth grade primary school students' total and sub-dimensions scores from the self-regulated learning strategies scale in mathematics and their mathematics course successes were examined in terms of their families' socio-economic status.

3. Results

1. In this section, the findings about whether students differed in terms of total and sub-dimensions scores from the self-regulated learning strategies scale in mathematics, mathematics course success, and socio-economic variables are included.

Table 2. KWH Test Results Related to Students' Total and Sub-Dimension Scores from the Self-regulated Learning Strategies Scale in Mathematics and Mathematics Course Success According to Mother's Educational Status

Variables	**Educational status**	**N**	**Rank Average**	**sd**	**X^2**	**p**	Meaningful difference
Mathematics course success	Illiterate	9	17.11	5	14. 154	.015	High school and Vocational School
	Primary school	16	24.00				
	Secondary School	12	27.33				
	High school	15	35.27				
	Vocational School	2	53.50				
	University	1	38.00				
Rehearsal	Illiterate	12	29.88	5	4.590	.468	
	Primary school	21	29.86				
	Secondary School	13	30.31				
	High school	16	39.00				
	Vocational School	2	49.00				
	University	1	43.50				
Organization	Illiterate	12	35.33	5	7.215	.205	
	Primary school	21	25.60				
	Secondary School	13	32.85				
	High school	16	38.38				
	Vocational School	2	41.25				
	University	1	60.00				
Metacognitive Self-Regulation	Illiterate	12	33.21	5	7.327	.197	
	Primary school	21	26.52				
	Secondary School	13	30.38				
	High school	16	41.66				
	Vocational School	2	37.50				
	University	1	53.00				
	Illiterate	12	34.00				
	Primary school	21	29.69				
	Secondary School	13	25.50				

	High school	16	42.03				
Time and Study Environment	Vocational School	2	36.25				
	University	1	37.00				
	Illiterate	12	30.63				
	Primary school	21	31.14				
	Secondary School	13	32.08				
Effort Regulation	High school	16	36.16	5	1.960	.855	
	Vocational School	2	46.75				
	University	1	34.50				
Peer Learning	Illiterate	12	32.92				
	Primary school	21	27.29				
	Secondary School	13	38.88	5	4.982	.418	
	High school	16	33.69				
	Vocational School	2	50.25				
	University	1	32.00				

Tablo 2. KWH Test Results Related to Students' Total and Sub-Dimension Scores from the Self-regulated Learning Strategies Scale in Mathematics and Mathematics Course Success According to Mother's Educational Status (Continued)

Variables	**Educational Status**	**N**	**Rank Average**	**sd**	**X^2**	**p**	Meaningful difference
	Illiterate	12	32.50				
	Primary school	21	29.02				
Help Seeking	Secondary School	13	34.69	5	3. 076	.688	
	High school	16	36.00				
	Vocational School	2	48.00				
	University	1	22.50				
Elaboration	Illiterate	12	27.50				
	Primary school	21	26.79				
	Secondary School	13	33.27				
	High school	16	43.56	5	10.272	.068	

	Vocational School	2	32.00			
	University	1	59.00			
Self-regulated learning strategies total scores	Illiterate	12	31.54			
	Primary school	21	25.93			
	Secondary School	13	30.88	5	8.757	.119
	High school	16	42.94			
	Vocational School	2	42.75			
	University	1	48.00			

According to Table 2, the mathematics course success of the students shows a significant difference according to the educational status of the mother. [$\chi^2(5) = 14.154$, $p<.05$]. As a result of multiple comparisons conducted with the Mann Whitney U-test for "mathematics course success", it was determined that this significant difference was in favor of those students whose mothers were high school or university graduates. No statistically significant difference was determined between the total scores of the subdimensions "Rehearsal" [$\chi^2(5) = 4.590$, $p>.05$], "Organization" [$\chi^2(5) = 7.215$, $p>.05$], "Metacognitive Self-Regulation" [$\chi^2(5) = 7.327$, $p>.05$], "Time and Study Environment" [$\chi^2(5) = 6.522$, $p>.05$], "Effort Regulation" [$\chi^2(5) = 1.960$, $p>.05$], "Peer Learning" [$\chi^2(6) = 4.982$, $p>.05$], " Help Seeking" [$\chi^2(5) = 3.076$, $p>.05$], and "Elaboration" [$\chi^2(5)= 10.272$, $p>.05$] and the total scores of the Self-regulated Learning Strategies Scale in Mathematics [$\chi^2(6) = 8.757$, $p>.05$] in terms of mother's educational status.

Table 3. KWH Test Results Related to Students' Total and Sub-Dimension Scores from the Self-regulated Learning Strategies Scale in Mathematics and Mathematics Course Success According to Father's Educational Status

Variables	**Educational Status**	**N**	**Rank Average**	**sd**	**X^2**	**p**	Meaningful difference
Mathematics course success	Illiterate	4	10.38	5	20.898	.001	
	Primary school	10	15.75				High school
	Secondary School	14	25.86				Vocational School
	High school	21	33.86				
	Vocational School	5	44.30				
	University	1	46.50				
	Illiterate	5	41.60				

	Primary school	15	26.57			
	Secondary School	16	33.31			
Rehearsal	High school	23	35.33	5	4.018	.547
	Vocational School	5	35.30			
	University	1	16.50			
	Illiterate	5	45.80			
	Primary school	15	25.87			
	Secondary School	16	30.78			
	High school	23	35.28	5	5.606	.346
Organization	Vocational School	5	39.00			
	University	1	29.00			
	Illiterate	5	46.50			
	Primary school	15	25.57			
	Secondary School	16	30.75			
Metacognitive Self-Regulation	High school	23	36.37	5	5.851	.321
	Vocational School	5	33.30			
	University	1	34.00			
	Illiterate	5	47.70			
	Primary school	15	26.43			
	Secondary School	16	30.41			
	High school	23	35.28	5	6.113	.295
Time and Study Environment	Vocational School	5	37.80			
	University	1	23.00			
	Illiterate	5	46.20			
	Primary school	15	22.83			
	Secondary School	16	37.25			
Effort Regulation	High school	23	33.09	5	10.438	.064
	Vocational School	5	41.30			
	University	1	8.00			

Table 3. KWH Test Results Related to Students' Total and Sub-Dimension Scores from the Self-regulated Learning Strategies Scale in Mathematics and Mathematics Course Success According to Father's Educational Status (Continued)

Variables	**Educational Status**	**N**	**Rank Average**	**sd**	**X^2**	**p**	Meaningful difference
Peer Learning	Illiterate	5	46.30				
	Primary school	15	32.27				
	Secondary School	16	31.25				
	High school	23	30.61	5	3.541	.617	
	Vocational School	5	38.70				
	University	1	32.00				
Help Seeking	Illiterate	5	41.30				
	Primary school	15	23.60				
	Secondary School	16	33.31				
	High school	23	36.02	5	5.894	.318	
	Vocational School	5	35.60				
	University	1	45.00				
Elaboration	Illiterate	5	31.00				
	Primary school	15	26.83				
	Secondary School	16	26.59				
	High school	23	40.24	5	7.891	.162	
	Vocational School	5	41.20				
	University	1	30.50				
Self-regulated learning strategies total scores	Illiterate	5	45.30				
	Primary school	15	24.23				
	Secondary School	16	30.41				
	High school	23	36.76	5	7.099	.213	
	Vocational School	5	38.90				
	University	1	28.50				

According to Table 3, a significant difference was determined in the mathematics course success of the students according to the educational status of their fathers. [$\chi 2(5) = 20.898$,

p<.01]. As a result of multiple comparisons conducted with the Mann Whitney U-test for "mathematics course success", a significant difference was found in favor of those students whose fathers were high school or university graduates.

No difference was determined between the total scores of the subdimensions "Rehearsal" [$\chi^2(5) = 4.\ 018$, $p>.05$], "Organization" [$\chi^2(5) = 5.606$, $p>.05$], "Metacognitive Self-Regulation" [$\chi^2(5) = 5.851$, $p>.05$], "Time and Study Environment" [$\chi^2(5) = 6.113$, $p>.05$], "Effort Regulation" [$\chi^2(5) = 10.\ 438$, $p>.05$], "Peer Learning" [$\chi^2(5) = 3.541$, $p>.05$], "Help Seeking" [$\chi^2(5) = 5.894$, $p>.05$], and "Elaboration" [$\chi^2(5) = 7.891$, $p>.05$] and the total scores of the Self-regulated Learning Strategies Scale in Mathematics [$\chi^2(5) = 7.099$, $p>.05$] in terms of father' educational status.

Table 4. KWH Test Results Related to Students' Total and Sub-Dimension Scores from the Self-regulated Learning Strategies Scale in Mathematics and Mathematics Course Success According to Family Income per Month

Variables	**Educational Status**	**N**	**Rank Average**	**sd**	**X^2**	**p**
	4000-6000 Turkish liras	42	28.51			
	6001-8000 Turkish liras	8	29.19			
	8001-10000 Turkish liras	1	55.00	3	6. 401	.094
Mathematics course success	10001-12000 Turkish liras	4	13.50			
Rehearsal	4000-6000 Turkish liras	48	34.49			
	6001-8000 Turkish liras	11	35.00			
	8001-10000 Turkish liras	1	8.00	4	4. 893	.298
	10001-12000 Turkish liras	1	16.50			
	Other	4	20.00			
Organization	4000-6000 Turkish liras	48	33.14			
	6001-8000 Turkish liras	11	35.36	4	1.293	.864
	8001-10000 Turkish liras	1	22.50			
	10001-12000 Turkish liras	1	16.50			
	Other	4	31.63			
Metacognitive Self-Regulation	4000-6000 Turkish liras	48	35.32			
	6001-8000 Turkish liras	11	28.05	4	4.767	.312
	8001-10000 Turkish liras	1	34.00			

	10001-12000 Turkish liras	1	1.50			
	Other	4	26.38			
Time and Study Environment	4000-6000 Turkish liras	48	33.85			
	6001-8000 Turkish liras	11	32.45	4	2.437	.656
	8001-10000 Turkish liras	1	29.50			
	10001-12000 Turkish liras	1	4.50			
	Other	4	32.25			
Effort Regulation	4000-6000 Turkish liras	48	35.28			
	6001-8000 Turkish liras	11	25.91			
	8001-10000 Turkish liras	1	16.00	4	3.250	.517
	10001-12000 Turkish liras	1	27.00			
	Other	4	30.88			
Peer Learning	4000-6000 Turkish liras	48	34.80			
	6001-8000 Turkish liras	11	27.95	4	2.292	.684
	8001-10000 Turkish liras	1	15.00			
	10001-12000 Turkish liras	1	32.00			
	Other	4	30.00			
	4000-6000 Turkish liras	48	34.24			
	6001-8000 Turkish liras	11	30.27	4	1.857	.762
Help Seeking	8001-10000 Turkish liras	1	45.00			
	10001-12000 Turkish liras	1	22.50			
	Other	4	25.25			

2. **Table 4.** KWH Test Results Related to Students' Total and Sub-Dimension Scores from the Self-regulated Learning Strategies Scale in Mathematics and Mathematics Course Success According to Family Income per Month (Continued)

Variables	Educational Status	N	Rank Average	sd	X^2	p
Elaboration	4000-6000 Turkish liras	48	33.14			
	6001-8000 Turkish liras	11	35.36			
	8001-10000 Turkish liras	1	22.50	4	.451	.978
	10001-12000 Turkish liras	1	16.50			
	Other	4	31.63			
Self-regulated learning strategies total scores	4000-6000 Turkish liras	48	34.77			
	6001-8000 Turkish liras	11	30.23			
	8001-10000 Turkish liras	1	30.00	4	3.086	.544
	10001-12000 Turkish liras	1	6.50			
	Other	4	26.75			

According to Table 4, no significant difference was found in mathematics course success in terms of family income per month [χ2(3) = 6.401, p >.05]. No difference was determined between the total scores of the subdimensions "Rehearsal" [$\chi^2(4) = 4.\ 893$, p>.05], "Organization" [$\chi^2(4) = 1.293$, p>.05], "Metacognitive Self-Regulation" [$\chi^2(4) = 4.\ 767$, p>.05], "Time and Study Environment" [$\chi^2(4) = 2.\ 437$, p>.05], "Effort Regulation" [$\chi^2(4) = 3.250$, p>.05], "Peer Learning" [$\chi^2(4) = 2.292$; p>.05], "Help Seeking" [$\chi^2(4) = 1.\ 857$, p>.05], and "Elaboration" [$\chi^2(4) = .451$, p>.05] and the total scores of the Self-regulated Learning Strategies Scale in Mathematics [$\chi^2(4) = 3.086$, p>.05] in terms of family income per month.

4. Discussion, Conclusion and Recommendations

In this study, when the fourth grade primary school students' total and sub-dimension scores of the Self-regulated Learning Strategies Scale in Mathematics were examined according to their mathematics course success, monthly income of their families, and educational status of their parents, no significant difference was found. Contrary to the finding in this study, Yılmaz (2020) determined a significant difference in the learning strategy skills of students in favor of those whose mothers were university graduates. Gür (2018), on the other hand, found a significant difference in the self-regulation skills of students in favor of those whose mothers were high school or university graduates. In addition, Yılmaz (2020) found a significant difference in the sub-dimension scores of

students' goal setting and planning skills in favor of those whose father's education level is secondary school and university.

In this study, it was observed that as the monthly income of the students' families and the educational status of their parents increased, the self-regulated learning strategies and the sub-dimension scores in mathematics were expected to increase; however, contrary to this expectation, these variables did not affect the students' self-regulated learning strategies in mathematics. It was determined that the socio-economic variable did not significantly affect the students' self-regulated learning strategies in mathematics.

In this study, it was determined that fourth grade primary school students whose parents were high school or university graduates were more successful in mathematics. As the education level of the parents increased, there was a statistical difference in the mathematics course success of the students. In other words, it was concluded that the education level of the parents positively affected the success of the children studying in primary school.

1) Based on online measurement methods, studies related to fourth grade primary school students' total and sub-dimension scores of the self-regulated learning strategies scale in mathematics can be conducted.

2) The "Self-regulated Learning Strategies Scale in Mathematics" used in this study was applied once on students. In future studies, this scale can be applied to fourth grade primary school students more than once during an academic term.

3) For future studies, a copy of the grade point averages (GPA) of fourth-year primary school students can be obtained through official means.

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