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# Metacognition, study habits and attitudes

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**Abstract**

This study is conducted to investigate the relationship between fifth grade students' metacognition levels, and their study habits and attitudes. Participants of the study consist of 221 students, 125 female and 96 male, enrolling to six public primary schools in Turkey. The results revealed that there is a medium positive relationship between metacognitive knowledge and skills and study habits ($r$ = .351, $p$ < .05), study attitudes ($r$ = .415, $p$ < .05) and study orientation ($r$ = .434, $p$ < .05). Additionally, the results of the study showed that there is no significant relationship between metacognition and study habits and attitudes for low and medium achievers but, there is a significant relationship for high achievers.

**Keywords:** *metacognition, study habits, study attitudes, study orientation*

## Introduction

Conscious individuals will be able to take part in society only if they are armed with self-knowledge ability (Morin, 2003). The efforts for educating conscious individuals began to follow a more meaningful trend, with appearance of metacognition and the studies done in this connection. Learners usually have some problems in deciding the amount of time they

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have to allocate for different tasks during studying. To decide the amount of time required for the tasks, learner monitors his/her learning, make decisions regarding the extent to which items have been learned and controls the amount of time allocated based on these decisions. Basically, monitoring and control occurred during the learning process are the two main components of metacognition (Nelson & Narens, 1990).

Flavell defines metacognitive processes as "one's knowledge concerning one's own cognitive processes and products . . . the active monitoring and consequential regulation of those processes in relation to the cognitive objects or data on which they bear" (Flavell, 1976, p. 232). It is observed that modern studies discuss the metacognition under two main headings: Metacognitive knowledge and metacognitive control (Flavell, 1979; Nelson & Narens, 1990; Otani & Widner, 2005; Sungur, 2007). Metacognitive knowledge, in one case, refers to one's knowledge and beliefs in his mental resources and his awareness about what to do. Metacognitive knowledge means one's own cognitive skills; own cognitive strategies and knowledge about what to do under which circumstances (Flavell, 1979). Metacognitive knowledge requires one to accurately and exactly define his/her thought or knowledge. An individual's ability in problem solving depends on effective use of his/her knowledge. If an individual does not have a decent perception about his/her knowledge, (s)he can consider, for example, being a successful student in problem solving as a hard work. In other words, approaches to the problem and insights into how to solve a problem is related to how accurately an individual assesses his/her knowledge (Flavell & Wellman, 1977). However, metacognition requires one, besides the knowledge mentioned above, to use this knowledge effectively. The ability to use metacognitive knowledge, on the other hand, is called metacognitive control.

Also called metacognitive strategies, the metacognitive control skills consists of leading mental operations in metacognitive processes and can be defined as the ability to use the metacognitive knowledge strategically in order to attain cognitive objectives (Desoete, 2008; Schraw & Moshman, 1995). The literature focuses on four metacognitive skills; prediction, planning, monitoring and evaluation (Brown, 1980, Desoete, Roeyers & Buysse, 2001; Desoete & Roeyers, 2002; Lucangeli & Cornoldi, 1997).

Metacognitive control/regulation is considered as the ability to use knowledge to regulate and control cognitive processes. Metacognitive control is related with metacognitive activities that help to control one's thinking or learning (Ozsoy, 2008). Students having the prediction skill think about the learning objectives, proper learning characteristics, and the available time. Prediction skill enables students to predict the difficulty of a task, by this way they use that prediction to regulate their engagement related to outcome. The selection of appropriate strategies and allocation of resources closely related with the prediction skill (Desoete, 2008). Monitoring refers to one's on-line awareness of comprehension and task performance. The ability to engage in periodic self-testing while learning is a good example (Winnie,

1997). Students having the evaluation skill appraise the products and regulatory processes of their learning. Students can re-evaluate their goals and conclusions. Evaluation enables students to evaluate their performance on the task, students can compare their performances with each other and they can use the result of comparison to locate the error in the solution process (Lucangeli, Cornoldi, & Tellarini, 1998).

Students with high metacognitive and self-regulatory abilities actively involve in their own learning process, plan and monitor the task they are focusing on, their own study attitudes and the task and the study attitudes fits together (Zimmerman &Martinez-Pons, 1986).

Forming study strategies that are effective in learning is a very important step in a child's educational development. To make effective study decisions, the child should have ability to differentiate the level of difficulty to learn the items. Research studies showed that this ability is fundamental for strategy formation during study (Son & Metcalfe, 2000; Son, 2004; Thiede & Dunlosky, 1999). Besides, seeking assistance from peers and teachers, having high self-efficacy and effective time management skills and being self-motivated are the characteristics of self-regulated learners (Ley & Young, 1998).

*Study habits*

In the literature, study skills are usually defined as students' ability to manage time and other resources to complete an academic task successfully. 'Study habit' is the amount and kinds of studying routines which the student is used during a regular period of study occurred in a conducive environment. Crede and Kuncel (2008) defines study habit as study routines, including, but not restricted to, frequency of studying sessions, review of material, self-testing, rehearsal of learned material, and studying in a conducive environment. Lastly, students' attitudes toward the act of studying (Crede & Kuncel, 2008) are referred as 'study attitudes'.

There are many factors affecting study orientation expressive of study habits and attitudes of students. Individual differences, effective usage of time, note-taking, study habits training, teacher, family, proper study environment, homework, using library, reading-listening and writing are outstanding common factors. However, interest and will are very important for study habits and attitudes. *Individual differences* can be analyzed in terms of control focus, gender, success dimensions. When the study habits are analyzed in terms of control focus it is revealed that students who have inner control do not need to be controlled too often when they undertake an assignment but students who are controlled with outer factors need guidance and encouragement too often (Bacanli, 2002: 133). Prociuk and Breen (1974) examined the relation between control focus (inner-outer), study habits and attitudes, and academic performance; they stated that there is a positive relation between them. When the differences are examined in terms of gender, it is revealed that female students are more

successful academically than male students and they have better study habits and attitudes (Arslantas, 2001; Brown & Holtzman, 1984; Grabill et al., 2005; Gadzella & Fournet, 1976; Hong & Lee, 2000; Houtte, 2004; Kucukahmet, 1987; Mullen, 1995; Tinklin, 2003). However, the result that students who have proper study habits and attitudes are also successful academically are evident according to many studies (Agnew et al., 1993; Arslantas, 2001; Carter, 1999; Elliot et al., 1990; Gordon, 1997; Jones et al., 1993; Kleijn et al., 1994; Lammers et al., 2001; Lawler-Prince et al., 1993; Schultz, 1989; Slate et al., 1990; Sunbul et al., 1998; Ulug, 1981).

*Effective usage of time* means reaching objectives without losing time when a person started to study (Telman, 1996: 40). Deficiency of skills in terms of effective time management is one of the most important problems of study habits (Glenn, 2003). Cusimano (1999) emphasizes that effective time management is very important for success. The first step of effective time management is making a plan and conforming to it (Ulug, 2000: 48). While being planned is so important for study habits of students, according to a study by Zeyrek et al. (1990) students between the ages of 16-21, only 18% have positive features in terms of organization and planning.

*Note taking* is an important dimension of study habits. Students who use proper study habits containing note taking and studying that notes, can preserve knowledge for longer time (Eliot et al., 2002). Oguz (1999), found a significant difference between the students who received note-taking training, taking notes at lessons and reviewing the notes and students who attending lessons without receiving note-taking training. Studies point out that effective note-taking increases students' success at lessons (Austin, Lee & Carr, 2003; Bretzing et al., 1987). However, many of the students prefer to take the notes of their friends (Wolff, 2001: 11).

*Present study*

The purpose of this study is to investigate the relationship between fifth grade students' metacognitive knowledge and skills and their study habits and attitudes. Besides, this study is also dealing with investigating how this relationship changes with students' GPA levels.

## Method

*Participants*

Fifth grade elementary school students enrolling to six schools in Zonguldak, a medium sized city on northwest coast of Turkey, participated in the study. Participants of the study have been comprised of 221 fifth grade students. Participants' profile has been drawn out by the analysis of demographic questions asked in 'Survey of Study Habits and Attitudes' (SSHA). Gender, age and parents' educational level are asked to gather the related data. There are 125 girls forming the 56.6% of the total sample and 96 boys forming the 43.4% of the total sample. The ages of participants

changed between 10 and 13 and the mean age of the students was 11.28. Table-1 summarizes participants' demographic characteristics.

**Table 1.** Participants' demographic characteristics

| | *n* | % |
|---|---|---|
| *Gender* | | |
| Male | 96 | 43.4 |
| Female | 125 | 56.6 |
| *Mother's Educational Level* | | |
| No graduate | 13 | 5.9 |
| Elementary school | 153 | 69.2 |
| High school | 37 | 16.7 |
| University | 1 | 0.5 |
| Missing | 17 | 7.7 |
| *Father's Educational Level* | | |
| No graduate | 3 | 1.4 |
| Elementary school | 110 | 49.8 |
| High school | 70 | 31.7 |
| University | 18 | 8.1 |
| Missing | 20 | 9.0 |

*Instruments*

*Metacognitive Skills and Knowledge Assessment (MSA-TR).* In order to assess students' metacognitive knowledge and skills an adapted version of MSA (Metacognitive Skills and Knowledge Assessment) was used. The MSA was developed by Desoete, Roeyers and Buysse (2001) and adapted into Turkish by Ozsoy (2007). It is a multi-method inventory in which the predictions are compared with the student performance as well. The MSA assesses two metacognitive components (knowledge and skills) including seven metacognitive parameters (declarative, procedural, and conditional knowledge, and prediction, planning, monitoring, and evaluation skills (Desoete, Roeyers & Buysse, 2001). The inventory consists of 160 items and through this inventory a student can score a minimum point of 0 and a maximum point of 360. During the development process of the inventory (MSA), test-retest correlation has been found as $r = .81$ ($p < .05$) (Desoete, Roeyers & Buysse, 2001). To examine the psychometric characteristics of the metacognitive parameters, Cronbach alpha reliability analysis was conducted by the researchers. For declarative knowledge, procedural knowledge, and conditional knowledge Cronbach alphas were .66, .74, and .70, respectively. For prediction, planning, monitoring, and evaluation Cronbach alphas were .64, .71, .87, and .60, respectively (Desoete, Roeyers & Buysse, 2001). During the adaptation of the instrument into Turkish, Ozsoy (2007) found test-retest correlation as .85 ($p < .05$). Cronbach's alpha values of MSA-TR were calculated as .71 for declarative knowledge, .70 for procedural knowledge, and .79 for conditional knowledge and for prediction, planning, monitoring, and evaluation as .73, .78, .80, and .76 respectively (Ozsoy, 2007).

*Survey of Study Habits and Attitudes (SSHA).* Participants' study habits and attitudes were assessed by administering "Survey of Study Habits and Attitudes" (SSHA) developed by Brown and Holtzman (1965) and adapted into Turkish by Memis (2007). The SSHA consists of 100 items that are arranged into four 25-item subscale named as 'work methods (WM)', 'delay avoidance (DA)', 'teacher acceptance (TA)' and 'educational acceptance (EA)'. SSHA is a 5-point Likert-type scale test. For each statement, the following scale is provided for indicating whether the student does or feels as the statement suggests: rarely, sometimes, frequently, generally and almost always. The subscales are used to formulate two subtotals; summation of scores obtained from WM and DA forms a score for 'study habits (SH)' and the total score obtained from the summation of TA and EA yield a 'study attitudes (SA)' score. The sum of all subscales is labelled 'study orientation (SO)'. Brown and Holtzman (1967) reported test-retest reliability scores for a four-week-interval for each subscale as .93, .91, .88 and .90 for the DA, WM, TA and EA subscales, respectively. During the adaptation process, statements are simplified and clarified and some of them are extracted to make the application of the instrument appropriate for fifth grade students. The last version of the study consists of 52 items with 13 items in each subscale. The Cronbach's alpha value for the instrument is calculated as .90. Each of the subscales has a maximum raw score of 26. The maximum raw score that can be obtained for study habits and study attitudes is 52 and for study orientation is 104.

*Achievement.* Achievement scores of participants are determined by grade point average (GPA). Participants are grouped into low, average and high achievers according to their GPA scores. In this grouping, for this study, low achievers ($n$ = 28) were defined as those who obtained GPA scores between 0 and 54. Participants who obtained GPA scores between 54 and 69 were defined as average ($n$ = 61) and those who obtained GPA scores between 70 and 100 were defined as high achievers ($n$ = 135).

*Procedure*

The study was carried out during the spring semester of 2009. The SSHA and the MSA-TR were administered to the participants on different days. Participants completed instruments independently. Data obtained from instruments were then organized into sub-scores and total scores for each instrument. Pearson $r$ correlation coefficients were computed between total scores on each instrument and between various combinations of sub-scores and total scores.

## Results

*Metacognitive knowledge and skills*

Analysis of the data obtained from MSA-TR revealed that participants obtained a mean score of 18.35 ($SD$ = 7.55) from declarative knowledge subscale and 17.95 ($SD$ = 7.07) from procedural knowledge subscale. For both of these subscales possible maximum score that can be obtained from

the instrument is 40. For the conditional knowledge subscale, possible maximum score that can be obtained is 60 and mean of participants' scores gathered from this part is 33.24 (*SD* = 12.98). The results did not differ too much for the subscales of metacognitive skills part. Mean of participants' scores obtained from the prediction subscale is 21.91 (*SD* = 10.46) and from the planning subscale is 12.52 (*SD* = 9.42). For both of these subscales maximum possible score that can be obtained is 60. For the other two subscales of metacognitive skills; evaluation and monitoring, participants obtained mean scores of 21.91 (*SD* = 12.73) and 21.18 (*SD* = 6.56) respectively. For both of these subscales possible maximum score that can be obtained is 40. Table 3 represents the descriptive statistics obtained from the analysis of MSA-TR scores.

**Table 3.** Analysis of the scores obtained from MSA-TR (*n*=223)

| | Min. | Max. | *M* | *SD* | PMS |
|---|---|---|---|---|---|
| Metacognitive knowledge | | | | | |
| *Declarative knowledge* | 0 | 37 | 18.35 | 7.55 | 40 |
| *Procedural knowledge* | 0 | 35 | 17.95 | 7.07 | 40 |
| *Conditional knowledge* | 6 | 70 | 33.24 | 12.99 | 80 |
| Metacognitive skills | | | | | |
| *Prediction* | 2 | 52 | 21.91 | 10.46 | 60 |
| *Evaluation* | 0 | 57 | 21.18 | 12.73 | 40 |
| *Monitoring* | 1 | 37 | 22.90 | 6.56 | 40 |
| *Planning* | 0 | 40 | 12.52 | 9.42 | 60 |
| Total | | | 148.32 | 43.39 | 360 |

* PMS: Possible maximum score.

### *Survey of Study Habits and Attitudes*

Analysis of the scores obtained from SSHA revealed that participants obtained a mean score of 17.02 (*SD* = 5.59) from WM subscale, 119.00 (*SD* = 8.91) from DA, 17.95 (*SD* = 5.41) from TA and 16.83 (*SD* = 5.08) from EA. Possible maximum score that can be obtained from subscales of SSHA is 26. Participants obtained a mean score of 33.36 (*SD* = 12.26) from SH and 34.78 (*SD* = 9.57) from SA. Possible maximum score that participants can obtain from both parts is 52. From the SO participants obtained a mean score of 68.14 (*SD* = 19.11) and possible maximum score that can be obtained is 104. Table 4 displays the descriptive statistics obtained from the analysis of SSHA scores.

**Table 4.** Analysis of the scores obtained from SSHA ($n$ = 223)

| | Min. | Max. | *M* | *SD* | PMS |
|---|---|---|---|---|---|
| Study Habits | 10.00 | 139.00 | 33.363 | 12.259 | |
| *Work Methods* | .00 | 26.00 | 17.018 | 5.597 | 26 |
| *Delay Avoidance* | 3.00 | 119.00 | 16.345 | 8.916 | 26 |
| Study Attitudes | 6.00 | 51.00 | 34.776 | 9.576 | |
| *Teacher Approval* | .00 | 26.00 | 17.946 | 5.406 | 26 |
| *Educational Acceptance* | 4.00 | 26.00 | 16.830 | 5.088 | 26 |
| Study Orientation | 25.00 | 179.00 | 68.139 | 19.115 | |

*Relationship investigation*

The relationships between metacognitive knowledge and skills, as measured by the MSA-TR, and study habits and attitudes, as measured by SSHA, were investigated using Pearson product-moment correlation coefficients. The results revealed that there is a medium positive relationship between metacognitive knowledge and skills and study habits ($r$ = .35, $p$ < .05), study attitudes ($r$ = .42, $p$ < .05) and study orientation ($r$ = .43, $p$ < .05).

Correlation coefficients are also calculated to investigate the relationship between metacognitive knowledge and skills and study habits and attitudes for participants' with different achievement levels (See Table 5).

**Table 5.** Correlation coefficients of MSA-TR and SSHA scores

| *Low achievers (n = 28)* | | |
|---|---|---|
| MSA-TR | SSHA | *r* |
| MSA-TR | Study Habits | .12 |
| MSA-TR | Study Attitudes | .13 |
| MSA-TR | Study Orientation | .15 |
| *Average achievers (n = 59)* | | |
| MSA-TR | Study Habits | -.09 |
| MSA-TR | Study Attitudes | .13 |
| MSA-TR | Study Orientation | .03 |
| *High achievers (n = 136)* | | |
| MSA-TR | Study Habits | .24* |
| MSA-TR | Study Attitudes | .38* |
| MSA-TR | Study Orientation | .35* |

* Correlation is significant at the.05 level.

For low achievers, the Pearson correlation coefficients revealed that the relationship between the variables is small, positive and non-significant. For

average achievers, the relationship between total score obtained from MSA-TR and study habits was small and negative. For study attitudes and orientation there exists a positive and small relationship with MSA-TR. All the correlation coefficients obtained for average achievers are found as non-significant. Lastly, the Pearson coefficients for high achievers show that all the relationships existing between total score of MSA-TR and subscales of SSHA are positive, medium and significant. Table 5 represents the correlation matrix of MSA-TR and SSHA scores for low, average and high achievers.

**Discussion**

This study deals with principally with the relationship between the participants' metacognitive knowledge and skills obtained by (MSA-TR) and their study habits and attitudes obtained by (SSHA).

Firstly, the scores of MSA-TR scale which was applied in order to evaluate students' metacognitive knowledge and skills, revealed that students have medium-level in terms of metacognition. This situation can be normal because the metacognitive development is associated with age (Schneider & Lockl, 2002) and study group is composed of fifth grade (mean age 11.28) students. On the other hand, metacognitive levels of students are compatible with the results of the measure conducted with the same age group (Ozsoy, 2007; Ozsoy & Ataman, 2009).

When the results of the SSHA which was used in order to define the study habits and attitudes, students' study attitude scores are lower than study habits. Delay avoidance subscale which measures organized and systematic studying, means being accurate and avoiding delay during studying. Teacher approval is a subscale in study attitudes. In this subscale, Students evaluate various criteria about their teachers. The findings are compatible with the results of measurements (Memis, 2005) conducted with same scale and same age group in terms of general averages of both sub-categories.

When the results of both scales are compared, there is a significant relation between the metacognition scores and SSHA scores of students in medium level. Metacognition scores are significantly related to both study habits and study attitudes. Metacognition is explained theoretically and it points out the self-knowledge and ability of individual to control cognitive processes of him/her with the knowledge. Students with high levels of metacognitive knowledge and skills can direct their own learning process successfully and therefore have high levels of study habits and attitudes. This is a predictable situation. Because a student with such a self-awareness would know how to work in certain conditions what (s)he would need and would organize the study attitudes accordingly. The results of the study are compatible with this theoretical prediction.

On the other hand, relations between the test scores of students are compared according to success levels of students. According to the comparison, there is a significant relation between the MSA-TR scores and

SSHA scores of successful students; but, there is not a significant relation between the scores in students with medium-low success rates. According to former studies, both metacognition (McDougall & Brady, 1998; Naglieri & Johnson, 2000; Ozsoy, 2009; Teong, 2002; Victor, 2004), and SSHA results (Memis, 2005) are related in terms of student achievement. Therefore, results of the study are compatible with former studies.

While former studies point out that there is a significant relation between metacognition and academic achievement (Case, Harris & Graham, 1992; Desoete & Roeyers, 2002), traning of metacognitive skills also increases the achievement (Kramarski, Mevarech & Arami, 2002; Lioe, Fai & Hedberg, 2005; McDougall & Brady, 1998; Schoenfeld, 1985; Schurter, 2002; Teong, 2002; Victor, 2004). However, according to literature review, there is not a study about the relation between metacognition and study habits and attitudes. Relational data acquired from the present study point out that metacognition is not only important for achievement but also for study habits and attitudes of students. Therefore we hope that present study should shed light for the following studies in the field.

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