

*Full Length Research Paper*

# **An analysis of teacher candidates' usage level of metacognitive learning strategies: Sample of a university in Turkey**

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**The purpose of this research is to evaluate the level metacognitive learning strategies are used by teacher candidates. The study was designed as a descriptive research. Study group of present research consists of 291 teacher candidates studying in the Faculty of Education within the body of a Western Anatolian university in Turkey. Research data have been obtained via "Metacognitive Learning Strategies Scale". Data have been analyzed by the way of frequencies, percentages, arithmetic mean, standard deviation, independent sample t-test and one-way ANOVA. As a result this study manifests that teacher candidates use metacognitive learning strategies in nearly medium level.**

**Key words:** Metacognitive learning strategies, teacher candidates, usage level of learning strategies.

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## **INTRODUCTION**

Learning is described as, "a relatively permanent change that occurs in behavior through experience". Learning is affected by a variety of factors concerning learner, teaching method and teaching material. Another factor having an influence on learning is learning strategies. According to Pillay (1988) identifying the learning strategies preferred and used by students plays a functional role in the quality of learning.

Strategy is the road taken to achieve something or conducting a plan developed to reach a particular target (Acikgoz, 2005). Learning strategies on the other hand are defined as the procedures used by student to achieve self-learning (Gagne and Driscoll, 1988), actions aiming to affect the way students process acquired knowledge (Mayer, 1989), techniques that facilitate a person's self-learning (Weinstein and Mayer, 1983). Learning strategies require the use of cognitive strategies such as encoding and retrieving as well as metacognitive

procedures that orient such strategies (Arends, 1997; cited in Namlu, 2004).

Flavell, the first person who used and developed the term metacognition explains this term as: "a person's own cognitive processes, outputs or anything related to them". Metacognition is a term used to refer to the procedures a person follows to realize, monitor, control and organize his/her own cognitive processes (Brown, 1987; Flavell, 1987). Flavell notes that at this point metacognition is explained by the knowledge a person possesses with respect to the way s/he learns (Slavin, 2006). This argument indicates that metacognition is based on cognition.

As the concepts of cognition and metacognition are simultaneously analyzed it is detected that cognition is the state of realizing and comprehending a particular thing whilst metacognition is, in addition to learning and understanding a certain thing, to have an awareness of

the way that particular thing is learnt (Blakey and Spence, 1990; Senemoglu, 2003). Accordingly the difference between cognitive and metacognitive learning strategies can be explained such: Cognitive dimension of learning strategies refers to the questions of “what” and “why” while metacognitive dimension is related to the questions of “when” and “why” (Weinsten and Mayer, 1983).

## LITERATURE REVIEW

Coutinho (2007) underscores that the most effective factor that carries goals to success is metacognitive learning strategies. Smith et al., (1997) report that metacognitive learning strategies are related to effective learning. They also argue that in order to ensure students' active participation into learning process and heighten their academic success, it is required to use metacognitive learning strategies. For this reason Akturk and Sahin (2011) claim that teachers are expected to use the methods and techniques in their lessons that improve students' use of metacognitive strategies.

As relevant literature is analyzed it grabs attention that learning strategies are classified with different numbers and titles by Acikgoz (2005), Brezin (1980), Dansereau et al. (1983), Gagne and Driscoll (1988), Jere (2012), O'Malley et al. (1985), O'Shea (2007), Oxford (1990), Ozer (1998), Pintrich et al. (1991), Senemoglu (2003), Todd and Mason (2005), Weinsten and MacDonald (1986), Weinsten and Mayer (1983). This differentiation can also be observed in metacognitive learning strategies. Brezin (1980) lists metacognitive learning strategies within five groups. They are namely planning, selective attention, analysis, review and evaluation. In the words of Oxford (1990; cited in Namlu, 2004) within metacognitive learning strategies there are three groups of strategies. These are placing learning into center, planning and evaluation. Blakey and Spence (1990; cited in Namlu, 2004) use a similar grouping by classifying metacognitive learning strategies three groups as planning, controlling and evaluation. Flavell (1987; cited in Dogan, 2011), on the other hand, analyzes metacognitive learning strategy under three groups; planning, monitoring and organization. As these classifications are examined it surfaces that the most frequently used metacognitive learning strategies in researches are planning, monitoring and evaluation strategies. However in current study the classification prepared by Namlu (2004) which is similar to the classifications of Brezin (1980) and Flavell (1987) has been considered. Within this classification “planning”, “organization”, “controlling” and “evaluation” strategies exist. This classification bears similarities with the other metacognitive learning strategies classification in relevant literature. According to Flavell (1987; cited in Dogan, 2011), Namlu (2004) and Brezin (1980), the key features of these metacognitive

learning strategies are as following:

“Planning strategy” is related to identification of objectives by the learner, analyzing the task to be achieved and reviewing possessed knowledge. These are the kind of strategies that a person employs while getting prepared for learning and the things related to the planning of this process.

“Organization strategy” implies processing of knowledge according to the metacognitive schemes existing on the mind of learner. It implies determining topic titles and key concepts beforehand for any given learning activity and towards this end reviewing the context to be learnt.

“Controlling strategy” is the strategy enabling a student to check whether the topic has been learnt, testing the accuracy of knowledge through comparison with previous knowledge, identifying the consistency and hierarchical structure of knowledge during learning process, controlling himself/herself and the knowledge that is learnt.

“Evaluation strategy” involves a learner's evaluation of learning process as a whole. The individual, through using evaluation strategies, assesses efficiency during learning process and the product that is attained.

In literature there are good number of researches on general learning strategies (Akin et al., 2007; Birenbaum and Rosenau, 2006; Cesur and Fer, 2007; Caglayan et al., 2008; Efe et al., 2009; Gijbels and Dochy, 2006; Karakis and Celenk, 2007; Ozdemir, 2004; Simpson et al., 1994). It is detected that researches dwelling on metacognitive learning strategies focus on primarily the connection of these strategies with many variables; academic success in particular (Alexander et al., 2006; Baltaci and Akpınar, 2011; Birenbaum, 1994; Cohen, 1995; Caliskan and Sunbul, 2011; Derman and Afyon, 2011; Karakale, 2012; Kurt and Gurcan, 2010; Nijhuis et al., 2008; Unal, 2010; Veenman and Beishuizen, 2004; Veenman and Spaans, 2005; Yalcin and Karakas, 2008).

Recognition of the learning strategies preferred by an individual matters greatly in the planning and development of teaching (Namlu, 2004). Therefore, it is necessary to demonstrate teacher candidates' usage level of metacognitive learning strategies like planning, organization, controlling and evaluation (Unal, 2010). However it has been determined that in relevant literature the number of studies related to the levels teacher candidates use metacognitive learning strategies is rather few. It is hoped that present research shall contribute to the aim of filling this gap.

## Purpose

The purpose of this research is to evaluate the level metacognitive learning strategies are used by teacher candidates. In line with this overall objective, research questions are posed as following:

**Table 1.** Arithmetic mean and standard deviation scores demonstrating teacher candidates' usage level of metacognitive learning strategies.

| Factor       | $\bar{X}$ | SS   |
|--------------|-----------|------|
| Planning     | 2.492     | .573 |
| Organization | 2.904     | .609 |
| Controlling  | 2.949     | .593 |
| Evaluation   | 2.531     | .590 |

- What is teacher candidates' usage level of planning, organization, controlling and evaluation strategies?
- Does the usage level of these strategies vary significantly with respect to teacher candidates' gender, grade point average, class level and department variables?

## METHOD

### Research model

The study was designed as a descriptive research. This model aims to describe a current situation that existed in the past or exists now in the way it is (Karasar, 2012). Accordingly within the scope of research it has been attempted to describe teacher candidates' usage level of metacognitive learning strategies in accordance with their views and the way these strategies exist in reality.

### Study group

Study group of present research consists of 291 teacher candidates studying in the Faculty of Education within the body of a Western Anatolian university in Turkey during 2011 to 2012 academic year spring term. Demographic features of teacher candidates constituting study group are such: With respect to gender variable 57.77% of participants are female, 42.3% are male. With respect to GPA (general point average) 22.0% of participants have GPA scores between 2.01 to 2.50, 48.5% have GPA scores between 2.51 to 3.00, 29.6% have GPA scores between 3.01 to 3.50. With respect to class level of participants 10.3% are 2nd grade (sophomore), 27.1% are 3rd grade (junior) and 62.5% are 4th grade (senior) students. With respect to department 24.4% of participants study in Primary School Teaching, 13.7% study in Science Teaching, 35.1% in Turkish Language Teaching, 16.2% in Primary Education Mathematics Teaching, 10.7% in Social Sciences Teaching departments.

### Instruments

Research data have been obtained via "Metacognitive Learning Strategies Scale" developed by Namlu (2004). The options in this 4 Likert type scale have been arranged as "always (4)" "often (3)", "sometimes (2)" and "never (1)". This scale consists of four factors as planning, organization, controlling and evaluation and collectively 21 items. Cronbach's alpha reliability score which indicates internal consistency coefficient of scale is .690 in planning factor; .739 in organization factor; .674 in controlling factor; .485 in evaluation factor; .816 for the overall scale. Factor loads of the items in scale

vary between .763 and .375. The analysis conducted on data obtained from this research indicates that factor loads of the items on this scale vary between .699 and .302. Also Cronbach alpha reliability of the scale has been computed as .659 in planning factor; .753 in organization factor; .740 in controlling factor; .512 in evaluation factor and .818 for the overall scale.

### Data analysis

SPSS 16.0 package program has been employed in the analysis of data. Demographic features of participants have been designated by using frequency and percentage techniques. Also in order to detect teacher candidates' views on the level of using metacognitive learning strategies arithmetic mean and standard deviation techniques have been used. In order to determine if there is a significant difference in views of participant groups with respect to gender variable "Independent Groups t-test" technique has been utilized. Furthermore with the aim of designating if there is a meaningful differentiation amidst the views teacher candidates express on the levels of using metacognitive learning strategies with respect to GPA, class level and department variables. One Way Variance Analysis (ANOVA) has been conducted. At the end of this analysis to identify the groups where detected differences exist, LSD (Least Significant Difference) test has been used. LSD test is applied in conditions when multiple comparisons are needed and in conditions when it is aimed to detect differences in opinions between comparison groups at the level below .05. One for each item in measurement instrument agreement levels have been graded as 4: "always (4.00-3.26), 3: "often (3.25-2.51), 2: "sometimes (2.50-1.76) and 1: "never (1.75-1.00). In the performed analyses significance level of the difference amidst groups has been taken as .05.

## RESULTS

Arithmetic mean and standard deviation scores and levels demonstrating teacher candidates' usage level of metacognitive learning strategies are indicated in Table 1.

Arithmetic mean score of the views of teacher candidates on the use of planning dimension of metacognitive learning strategies is 2.492. This value signifies that teacher candidates "sometimes" use planning dimension of metacognitive learning strategies.

Table 1 illustrates that arithmetic mean score of the views of teacher candidates on the usage level of organization strategy is 2.904. This value signifies that teacher candidates "often" use organization dimension of metacognitive learning strategies.

Arithmetic mean score of the views of teacher candidates on the use of controlling dimension of metacognitive learning strategies is 2.949. This value signifies that teacher candidates "often" use controlling dimension of metacognitive learning strategies.

Arithmetic mean score of the views of teacher candidates on the use of evaluation dimension of metacognitive learning strategies is 2.531. This value signifies that teacher candidates use evaluation strategy "often" which is a value close to the average figure.

As presented in Table 1, standard deviation scores of

**Table 2.** Results of independent groups t-test related to the views of teacher candidates on their usage level of metacognitive learning strategies with respect to gender variable.

| Factor       | Female (f=168; 57.7%) |      | Male (f=123; 42.3%) |      | T & P values |       | Levene's test |      |
|--------------|-----------------------|------|---------------------|------|--------------|-------|---------------|------|
|              | $\bar{X}$             | SS   | $\bar{X}$           | SS   | t            | p     | F             | p    |
| Planning     | 2.586                 | .554 | 2.410               | .586 | 2.606        | .010* | .790          | .375 |
| Organization | 3.002                 | .553 | 2.772               | .657 | 3.226        | .001* | 1.496         | .222 |
| Controlling  | 3.020                 | .544 | 2.853               | .644 | 2.385        | .018* | 2.811         | .095 |
| Evaluation   | 2.523                 | .542 | 2.542               | .653 | -.269        | .788  | 3.555         | .060 |

P<.05.

**Table 3.** One-way variance analysis (ANOVA) results of the views of teacher candidates on the use of metacognitive learning strategies with respect to GPA variable.

| Factor       | 2.01-2.50<br>(f=64; 22.0%) 1 |     | 2.51-3.00<br>(f=;141; 48.5%) 2 |     | 3.01-3.50<br>(f=;86; 29.6%) 3 |     | Test of homogeneity |     | ANOVA |      | GD    |
|--------------|------------------------------|-----|--------------------------------|-----|-------------------------------|-----|---------------------|-----|-------|------|-------|
|              | $\bar{X}$                    | SS  | $\bar{X}$                      | SS  | $\bar{X}$                     | SS  | Levene              | p   | F     | p    |       |
| Planning     | 2.46                         | .56 | 2.45                           | .56 | 2.64                          | .57 | .20                 | .81 | 3.15  | .04* | 3-1.2 |
| Organization | 2.88                         | .56 | 2.84                           | .62 | 3.01                          | .60 | .15                 | .85 | 2.29  | .10  | -     |
| Controlling  | 2.84                         | .55 | 2.87                           | .57 | 3.15                          | .61 | .30                 | .74 | 7.57  | .00* | 3-1.2 |
| Evaluation   | 2.51                         | .61 | 2.55                           | .61 | 2.50                          | .54 | .86                 | .42 | .21   | .81  | -     |

P<.05: GD: Groups which have differences.

the views of teacher candidates on metacognitive learning strategies are .573 in planning strategy .609 in organization strategy, .593 in controlling strategy and .590 in evaluation strategy. These values reveal that the parallelism, consistency and accordance of views amidst teacher candidates are high, that teacher candidates express views that are similar to one another and their views are close to the arithmetic mean.

With respect to gender variable the views of teacher candidates on their usage level of metacognitive learning strategies are as given in Table 2.

As represented in Table 2, it has been detected there is a significant difference [p<.05] between the views of female and male teacher candidates with respect to the use of planning, organization and controlling strategies that are amidst teacher candidates' metacognitive learning strategies. As the arithmetic mean score of groups is taken into consideration, it has been detected these strategies are more widely used by female teacher candidates than males. On the other hand, it has been detected that there is no significant difference [p>.05] between the views of female and male teacher candidates with respect to the use of evaluation strategy.

Table 3 exhibits the findings illustrating the views of teacher candidates on the use of metacognitive learning strategies with respect to GPA variable.

With respect to GPA variable, a significant difference [p<.05] has been detected amidst teacher candidates' views on the use of planning and controlling strategies.

As average mean scores of the views of groups are examined it surfaces that teacher candidates with 3.01 or higher GPA use planning and controlling strategies in higher levels compared to others. On the other hand with respect to GPA variable no significant difference [p>.05] has been detected amidst teacher candidates' views on the use of organization and evaluation strategies.

Table 4 exhibits the findings illustrating the views of teacher candidates on the use of metacognitive learning strategies with respect to class level variable.

Table 4 demonstrates that with respect to class level variable there is a significant difference [p<.05] amidst teacher candidates' views on the use of planning strategy. Obtained finding indicates that 2nd grade teacher candidates use this strategy in higher levels. On the other hand, in terms of class level variable no significant differentiation [p>.05] in the use of organization, controlling and evaluation strategies has been detected amidst the views of teacher candidates.

Table 5 exhibits the findings illustrating the views of teacher candidates on the use of metacognitive learning strategies with respect to department variable.

With respect to department variable a significant difference [p<.05] has been detected amidst teacher candidates' views on the use of planning strategy. As average mean scores are examined it surfaces that teacher candidates from primary school teaching and primary education mathematics teaching undergraduate departments use planning strategy in lower levels. On

**Table 4.** One-way variance analysis (ANOVA) results of the views of teacher candidates on the use of metacognitive learning strategies with respect to class level variable.

| Factor     | 2 <sup>nd</sup> grade<br>(f=30; 10.3%) 1 |     | 3 <sup>rd</sup> grade<br>(f=79; 27.1%) 2 |     | 4 <sup>th</sup> grade<br>(f=182; 62.5%) 3 |     | Test of<br>homogeneity |     | ANOVA |     | GD |
|------------|--|-----|--|-----|---|-----|------------------------|-----|-------|-----|----|
|            | $\bar{x}$                                | SS  | $\bar{x}$                                | SS  | $\bar{x}$                                 | SS  | Level<br>ne            | p   | F     | p   |    |
| Planning   | 2.7                                      | .53 | 2.45                                     | .57 | 2.49                                      | .57 | .09                    | .90 | 3.10  | .04 | 1- |
| Organizat  | 2.9                                      | .58 | 2.88                                     | .59 | 2.90                                      | .62 | .25                    | .77 | .18   | .83 | -  |
| Controllin | 3.0                                      | .55 | 2.92                                     | .57 | 2.94                                      | .61 | .59                    | .55 | .32   | .72 | -  |
| Evaluatio  | 2.5                                      | .59 | 2.56                                     | .59 | 2.51                                      | .59 | .13                    | .87 | .17   | .83 | -  |

the other hand with respect to department variable no significant difference [ $p > .05$ ] has been detected amidst teacher candidates' views on the use of organization, controlling and evaluation strategies.

## DISCUSSION AND CONCLUSION

Based on the findings obtained within the scope of present research it has been detected that teacher candidates "sometimes" use "planning" strategy which is one of the learning strategies. On the other hand it has been designated that teacher candidates "often" use "organization", "controlling" and "evaluation" strategies. This finding is parallel to the results deduced from many other researches in relevant literature (Belet and Guven, 2011; Ekenel, 2005; Gundogan-Cogenli, 2011; Celenk and Karakis, 2007; Ilgaz, 2006; Karalar, 2006; Nist and Holschuh, 1985; Riazi and Rahimi, 2005; Tasci et al., 2008).

Aside from that when teacher candidates' usage level is listed from top to bottom, it has been detected that controlling, organization, evaluation and planning strategies are used. Collected findings imply that although teacher candidates support the use of learning strategies they still fail to use these strategies in the highest levels. This finding obtained from present research corresponds to the findings of relevant researches. The findings of Baykara's (2011) study reveal that teacher candidates use planning, organization, controlling and evaluation strategies in nearly a medium level. Akillilar and Uslu's (2011) research findings manifest that teacher candidates use metacognitive strategies in medium level. A study conducted by Unal (2010) has also provided similar results. The findings of relevant research have demonstrated that teacher candidates use planning and evaluation strategies in the lowest level; organization and controlling strategies in the highest level.

With respect to gender variable it has been found out that female teacher candidates use planning, organization and controlling strategies higher than males. "Evaluation" strategy on the other hand is used by both male and female teacher candidates in a close level to

one another. Once the topic is analyzed as a whole, it draws attention that female teacher candidates use learning strategies in higher levels. In relevant literature there are some studies in favor of or against this result. Indeed in a study conducted by Baykara (2011) and Unal (2010) covering teacher candidates reported that with respect to gender variable there is a significant difference in the use of learning strategies and that female teacher candidates are found using this strategy in higher levels. Additionally the researches of Celikkaya and Kus (2010) and Oflaz (2008) demonstrate that with respect to gender variable between the learning strategies preferred by primary and secondary education students there is a significant differentiation in favor of girls. Nonetheless Gundogan-Cogenli's (2011) research on teacher candidates and Ertekin's (2006) research on primary education students advocate that the use of learning strategies does not differ with respect to gender variable.

With respect to GPA variable it emerged that teacher candidates with GPAs between 3.01 to 3.50 use "planning" and "controlling" strategies in higher levels. On the other hand usage level of "organization" and "evaluation" strategies with respect to GPA variable has been close to one another. Related to this issue Iflazoglu Saban and Tumkaya (2008) in their research have attained the finding that with respect to GPA level of teacher candidates, the kind of learning strategies they use differs. This finding proves that findings obtained from both studies support each other.

With respect to class level variable it has been detected that teacher candidates in 2nd grade use "planning" strategy in a higher level. Likewise the findings obtained from Hamurcu's (2002) research also manifest that some of the learning strategies used by teacher candidates significantly differ with respect to their class level. Besides it has also been designated that "organization", "controlling" and "evaluation" strategies are used by 2nd, 3rd and 4th grade teacher candidates in levels close to each other. A general assessment has shown that with respect to class level teacher candidates' usage level of learning strategies does not significantly vary. Findings received from Unal (2010) and Arsal's (2005) research support this outcome. Indeed these researches manifest

**Table 5.** One-way variance analysis (ANOVA) results of the views of teacher candidates on the use of metacognitive learning strategies with respect to department variable.

| Factor       | PST (f=71;<br>24.4%)1 |     | ST (f=;40;<br>13.7%) 2 |     | TLT (f=;102;<br>%35.1)3 |     | PEMT<br>(f=;47; %16.2)4 |     | SST (f=31;<br>%10.7)5 |     | Test of<br>homogeneity |     | ANOVA |      | GD                  |
|--------------|-----------------------|-----|------------------------|-----|-------------------------|-----|-------------------------|-----|-----------------------|-----|------------------------|-----|-------|------|---------------------|
|              | $\bar{X}$             | SS  | $\bar{X}$              | SS  | $\bar{X}$               | SS  | $\bar{X}$               | SS  | $\bar{X}$             | SS  | Lev.                   | p   | F     | p    |                     |
| Planning     | 2.40                  | .62 | 2.59                   | .51 | 2.59                    | .55 | 2.26                    | .52 | 2.75                  | .52 | .59                    | .66 | 5.37  | .00* | 1-2.3.5;<br>4-2.3.5 |
| Organization | 2.94                  | .57 | 2.92                   | .69 | 2.94                    | .59 | 2.69                    | .60 | 2.97                  | .57 | .06                    | .99 | 1.76  | .13  | -                   |
| Controlling  | 3.03                  | .52 | 2.94                   | .65 | 2.96                    | .63 | 2.74                    | .53 | 3.01                  | .54 | .97                    | .42 | 1.83  | .12  | -                   |
| Evaluation   | 2.61                  | .54 | 2.56                   | .59 | 2.54                    | .66 | 2.34                    | .48 | 2.54                  | .58 | 1.61                   | .17 | 1.56  | .18  | -                   |

PST: Primary School Teaching, ST: Science Teaching, TLT: Turkish Language Teaching, PEMT: Primary Education Mathematics Teaching, SST: Social Sciences Teaching.

that with respect to class level, teacher candidates' usage level of learning strategies does not significantly vary.

With respect to department variable it has been detected that teacher candidates from science teaching, Turkish language teaching and social sciences teaching undergraduate departments use "planning" strategy in higher levels. "Organization", "controlling" and "evaluation" strategies on the other hand have been used by teacher candidates from all departments in levels close to one another.

Overall findings of present research manifest that teacher candidates use metacognitive learning strategies in nearly medium level. Henceforth counseling and guidance services may be provided to teacher candidates to guide them in the use of metacognitive learning strategies in higher levels. Aside from that on the issue of metacognitive learning strategies and the use of these strategies, conceptual and practical trainings can be provided for teacher candidates.

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