EVALUATION OF VOCATIONAL SCHOOL STUDENTS' VIEWS ON METACOGNITIVE SKILLS

MESLEK YÜKSEKOKULU ÖĞRENCİLERİNİN ÜSTBİLİŞSEL YETENEKLER HAKKINDAKİ GÖRÜŞLERİNİN DEĞERLENDİRİLMESİ

Dr. Okan SARIGÖZ
Akdeniz University Depertment of Child Development

Abstract

Cognition means that an individual has knowledge about any subject, becomes conscious, and recognizes or knows oneself and his environment. Metacognition, on the other hand, the individual becomes aware of changes in oneself in the course of these processes, and controls these processes. The aim of this research is to determine the opinions of vocational school students about metacognitive skills by considering some demographic variables. The sample of the research constitutes 796 students studying in Adana Vocational School of Çukurova University in 2015-2016 school year. General scanning model was used in the research. According to the results obtained from the research, it was determined that the students have such thoughts that individuals regulate their thoughts regarding disconcerting, increase their motivations and successes, but disconcerting is not effective on avoiding the problems. Moreover, such results have been reached in the research that there is no a significant difference of opinion between the students in the 1st and 2nd grade depending on variable of grade level in terms of metacognitive skills, however, female students use their metacognitive skills more than male students depending on gender variable.

Keywords: Cognition, Metacognition, Strategic Knowledge, Cognitive Awareness, Inner Thought

Öz

Biliş, bireyin her hangi bir konuda bilgi sahibi olması, bilinçli duruma geçmesi, kendisini ve çevresini tanıması veya bilmesi gibi anlamlara gelmektedir. Üstbiliş ise bu süreçler esnasında bireyin kendisindeki değişimlerin farkında olması ve bu süreçleri kontrol etmesidir. Bu araştırmanın amacı; Meslek Yüksekokullarında okuyan öğrencilerin, üstbilişsel yetenekler hakkındaki düşüncelerini bazı demografik değişkenleri de göz önünde bulundurarak belirlemeye çalışmaktır. Araştırmanın örneklemini, 2015-2016 öğretim yılında Çukurova Üniversitesine bağlı Adana Meslek Yüksekokulunda okuyan 796 öğrenci oluşturmaktadır. Araştırmada genel tarama modeli kullanılmıştır. Araştırmada elde edilen sonuçlara göre öğrencilerin, endişelenme ile ilgili olarak bireylerin düşüncelerini düzene sokacağı, motivasyonlarını artıracağı ve başarıyı yükselteceği ancak endişelenmenin problemlerden kaçmada etkili olamayacağı gibi düşüncelere sahip oldukları belirlenmiştir. Ayrıca araştırmada 1. sınıfta okuyan öğrenciler ile 2. sınıfta okuyan öğrenciler arasında sınıf düzeyi değişkenine bağlı olarak üstbilişsel yetenekler açısından anlamlı bir görüş farkının olmadığı ancak cinsiyet değişkenine bağlı olarak kadın öğrencilerin erkek öğrencilere oranla üstbilişsel yeteneklerini daha fazla kullandıkları gibi sonuçlara da ulaşılmıştır.

1. INTRODUCTION

Individuals' desired level of achievement in accordance with the purpose is closely related to being aware of their own situation cognitively and meta-cognitively. Cognition means that a living being becomes knowledgeable about and conscious of existence of an object or event (TDK, 2005; Dönger, 2015). According to Şendurur & Barış (2002), it includes all workings of human mind to understand the world and the events around it. To Pehlivan (2012: 13), it means various mental activities which include learning about and understanding the world. Metacognition is defined as supra-cognition or beyond-cognition. Also, metacognition is described as the high-level cognitive structures, knowledge and processes that control, regulate and evaluate cognitions (Tosun & Irak, 2008: 68).

Metacognition is a system including one's awareness of events and functions in his own mind, purposefully guiding mental events and functions (Crick, 2000; Dienes & Perner, 1999). It means one's awareness of hisown cognitive processes, and control of these processes (Flavell, 1979; Huitt, 1997; Özkartal, 2012; Hacker & Dunlosky, 2003; Jager, Jensen & Reezigt, 2005). Also, it can be defined as one's knowledge about what he knows, one's thought about what he thinks or one's looking at his own cognitive process (Saban & Saban, 2008). According to Welton & Mallan (1999: 283), it is defined as those students consciously control their own thinking processes and guide them in order that they think freely. Metacognition is one's self-knowledge, one's knowledge about his aims and needs, one's monitoring his own activity, and one's finding his self-awareness regarding his evaluation (Özbay & Bahar, 2012: 175). When all definitions are carefully examined, it seems that metacognition takes place on the basis of thinking and includes all thinking skills (Demir & Özmen, 2011: 46). Cognition deals with the things we are doing, on the other hand, metacognition deals with choosing, planning the things we will do, and monitoring them we have done (Garofalo & Lester, 1985: 163-164; Artzt & Armour-Thomas, 1992: 141).

The concept of metacognition was used for the first time by Fravell in his research regarding children's advanced memory skills in 1976 (Georghiades, 2004: 365). Afterwards Fravell (1979-2000), describes metacognition as one's self-knowledge and one's knowledge about his strategy and job. In his point of view Fravell (1979), metacognition plays an important role in the fields of communication, reading comprehension, language learning, social cognition, attention, self-control, memory, self-education, writing, and problem solving. Doğanay (1997), identifies the skills expected to occur with metacognition as one's awareness of self-knowledge and learning ways, conscious behaviour, self-control, self-planning, monitoring one's own learning, self-regulation, and self-evaluation.

According to Dunlosky & Metcalfe (2009), metacognition is composed of three stages which are metacognitive knowledge, metacognitive monitoring, and metacognitive control.

To Flavell (1979-2000), *metacognitive knowledge* deals with what is known about how our cognitive operations occur, and includes the knowledge about cognitive features and cognitive tasks. According to Brown (1987), metacognitive knowledge is a stage which can be verbally expressed in general, and can be faulty, and requires to look at cognitive processes. Metacognitive knowledge is stored in long-term memory, so it is declarative knowledge that has a stable characteristic relatively because of its structure (Schneider & Lockl, 2002).

According to Dunlosky & Metcalfe (2009), *metacognitive monitoring* is an evaluation of a cognitive activity's current situation or its ongoing progress. Thanks to metacognitive monitoring, an individual monitors his own cognitive processes, and evaluates his own situation. Therefore, he decides whether he is capable of doing any job, or whether he sees the point or not. To Schneider & Lockl (2002), metacognitive monitoring cognitively gives the individual situational knowledge regarding his own situation in accordance with his own purpose.

Metacognitive control is the regulation process of an ongoing activity. These regulations which are related to activity can be continuation of, suspension of, alteration of or abolishment of activity. They are choices made consciously or unconsciously depending on the knowledge obtained from the result of monitoring, control-

ling, and evaluating meta-cognitively. As a result of the decision taken, they determine the developed strategy regarding activity (Dunlosky & Metcalfe, 2009; Nelson & Narens, 1990).

When the researches on metacognition are reviewed, it was determined from the research results that metacognition increases problem solving abilities, collaboration and success, and improves questioning skills and learning, and fosters awareness and positive attitudes, and develops self-control, and provides to use the knowledge effectively, and improves social skills (Çakıroglu, 2007; Özsoy, 2008; Demir-Gülşen, 2000; Küçük-Özcan, 2000; Gelen, 2004; Howard, McGee, Shia & Namsoo, 2000; Aktürk & Şahin, 2011; Copper, 2008; Özkartal, 2015a-2015b; Georghiades, 2004; Kramarski, 2008; Flavell, 2000; Mevarech & Amrany, 2008).

2. METHOD
2.1. Problem Sentence

At what level are the views of vocational school students about their metacognitive skills?

2.2. The Objective of the Research

The objective of this research is to determine the views of vocational school students about their metacognitive skills by considering demographic variables of gender, grade level, age, and type of program. In the research, referring to the students' views and opinions, the effort has been made to put forward various recommendations regarding metacognitive skills.

2.3. The Population and the Sample

The population of the research constitutes all students studying in the programs at Çukurova University, and the sample of this research constitutes 796 students studying in the programs of Computer Programming (CP), and of Child Development (CD), and of Accounting and Tax Applications (ATA), and of Fashion Design (FD), Radio and Television Programming (RTP), and of Interior Design (ID), and of

Construction Technician (CT) in Adana Vocational School at Çukurova University.

2.4. The Research Model

Metacognition Scale-30 (MCS-30) developed by Cartwright-Halton & Wells (1997), and then the short-form of it made by Wells & Cartwright-Halton (2004), and its adaptation to Turkish and validity and reliability studies made by Tosun and Irak (2008), has been used in this research. Cronbach's Alpha reliability of the sub-dimensions of the scale composed of 30 items and 5 sub-dimensions of Positive beliefs, Cognitive reliance, Recalcitrance and danger, Cognitive awareness and Need to control, was found to be between .72 and .89. Cronbach's Alpha reliability of the scale was found to be .93. The interitem correlation matrix of the scale was found to be .3. CFI (Comparative Fit Index) made for the construct validity of the scale, was calculated as .90, and RMSR (Root Mean Square Residual), the structure-based testing with analysis, was calculated as .04.

The answers of the students participating in the research to the scale items depending on the demographic variables were calculated by using Anova test which is an F test, t-test and one-way variance analysis with the help of SPSS 20 statistical software package. In the research, t-test was used for binary variables, and Anova test was used when the study involves three or more variables. All likert questions in the scale that was used in the research were graded from positive (5) to negative (1), and from negative (1) to positive (5). When the data was interpreted, significance level of ($p<0,05$) was used, and the research data was interpreted according to this. The scale used in the research consists of five point likert type 30 items including (1) Strongly Disagree (2) Disagree, (3) Undecided, (4) Agree, and (5) Strongly Agree. Overall assessment of the scale used in the research was determined as below (Cengiz, Sarıgöz & Dönger, 2015; Sarıgöz & Demiralay, 2015; Sarıgöz, Dönger & Cengiz, 2015; Sarıgöz, Sağ & Cam, 2015):

$$\text{RO} = \frac{\text{HV - LV}}{\text{NO}} = \frac{5-1}{5} = 0{,}8$$

RO: Range of Options   HV: The Highest Value

LV: The Lowest Value
NO: Number of Options

1.00 – 1.80: Strongly Disagree

1.81 – 2.60: Disagree
2.61 – 3.40: Undecided
3.41 – 4.20: Agree
4.21 – 5.00: Strongly Agree

In the research, 'General Screening Model', one of the descriptive screening methods was used. General screening model is the screening arrangements carried out on a group, sample group or a paradigm or the entire universe in order to draw conclusion about the universe composed of numerous elements (Karasar, 2010: 76). General screening model is a research model used to specify the types of information such as people's attitudes, beliefs, values, habits and opinions (Mcmillan & Schu-

macher, 2001).

3. FINDINGS

In this part of the research, findings and interpretations based on the students' views about their metacognitive skills are presented. In accordance with the purpose of the research, the Metacognitive Scale-30 was applied to the students, and the answers of the students to the scale were tabulated and interpreted.

Table 1: t-test analysis results of the vocational school students' answers to the Metacognition Scale-30 (MCS-30) according to gender variable

Gender	N	$\overline{\chi}$	Ss	Sd	t	p
1.Female	408	123,096	10,351	794	2,252	,025
2.Male	388	121,394	10,965			

p<0,05

When the data in Table 1 was examined, from the answers of the vocational school students participating in the research to the Metacognition Scale-30 (MCS-30), it was determined that there is a statistically significant difference (p<,05) between female and male students in favour of female students in terms of their opinions about metacognitive skills according to gender variable. From the data obtained from the research, it can be said that female students are more careful about the use of metacognitive skills than male students.

Table 2: t-test analysis results of the vocational school students' answers to the Metacognition Scale-30 (MCS-30) according to grade level variable

Grade Level	N	$\overline{\chi}$	Ss	Sd	t	p
1st Grade	404	121,542	11,079	794	1,945	,052
2nd Grade	392	123,013	10,217			

p>0,05

When the data in Table 2 was examined, it was determined that there is no a statistically significant difference (p<,05) between the students in the 1st grade and 2nd grade in terms of their opinions about metacognitive skills according to the variable of grade level. In the light of the research data, it can be said that the students in the 1st grade and 2nd grade have similar views about the use of metacognitive skills.

Table 3: Anova test analysis results of the vocational school students' answers to the Metacognition Scale-30 (MCS-30) according to age variable

Age	N	$\overline{\chi}$	Ss	Varia. Source	Sum of Squa.	Sd	Mean Squa.	F	p	Sign. Diff. (Tky)
1)18-20	580	122,5	10,6	Wt. Gr.	182,4	4	45,6	,398	,81	
2)21-23	114	121,4	10,5	Bw. Gr.	90529,1	791	114,4			
3)24-26	45	121,8	12,3	Total	90711,5	796				
4)27-29	33	121,6	10,2							
5)30-+	24	121,0	10,4							
Total	796	122,2	10,6							

p>0,05

When the data in Table 3 was examined, it was determined that there is no a statistically significant difference (p<,05) between the students aged 18-20, 21-23, 24-26, 27-29 and 30- and over in terms of their opinions about metacognitive skills according to age variable. In the light of the research data, it can be said that the students of different age groups have similar views about the use of metacognitive skills $[F_{(,398)}, p_{(,810)}; p> ,05]$

Table 4: Anova test analysis results of the vocational school students' answers to the Metacognition Scale-30 (MCS-30) according to the variable of the type of program

Type of Pr.	N	$\overline{\chi}$	Ss	Varia. Source	Sum of Squares	Sd	Mean Square	F	p	Signif. Diff. (Tky)
1)CP	227	123,35	9,57	Wit. Gr.	5145,79	6	857,63	7,908	,000	1-3
2)CD	114	125,61	9,50	Btw. Gr.	85565,75	789	108,45			1-5
3)ATA	151	119,27	12,23	Total	90711,54	795				2-3
4)FD	74	119,57	11,37							2-4
5)RTP	72	119,03	11,49							2-5
6)ID	79	122,08	7,81							7-3
7)CT	79	125,72	10,54							7-5
Total	796	122,27	10,68							

p<0,05

When the data in Table 4 was examined, from the answers of the students participating in the research and studying in different programs, it was determined that there are statistically significant differences between the students studying in the programs of Computer Programming (CP), Accounting and Tax Applications (ATA), and Radio and Television Programming (RTP) in favour of the students studying in the program of Computer Programming (CP); between the students studying in the programs of Child Development (CD), Accounting and Tax Applications (ATA), Fashion Design (FD), and Radio and Television Programming (RTP) in favour of the students studying in the program of Child Development (CD); between the students studying in the programs of Construction Technology (CT), Accounting and Tax Applications (ATA), and Radio and Television Programming (RTP) in favour of the students studying in the program of Construction Technology (CT) according to the type of program variable $[F_{(7,908)}, p_{(,000)}; p< ,05]$.

Table 5: Arithmetic averages and skill levels of the answers of the students who participated in the research to the Metacognition Scale-30 (MCS-30)

THE ITEMS OF METACOGNITION SCALE-30 (MCS-30)	$\overline{X}$	Skill Level
3. Worrying helps me to sort out my thoughts in my mind.	4,45	Str. Agree
4. Worrying helps me cope.	4,34	Str. Agree
9. I have a poor memory.	4,24	Str. Agree
8. My memory can mislead me at times.	4,23	Str. Agree
21. I monitor my thoughts.	4,21	Str. Agree
12. I have little confidence in my memory for actions.	4,21	Str. Agree
5. Worrying helps me to solve problems.	4,20	Agree
20. I am aware of the way my mind works when I am thinking through a problem.	4,20	Agree
2. I need to worry in order to remain organized.	4,13	Agree
28. Not being able to control my thoughts is a sign of weakness.	4,12	Agree
19. I think a lot about my thoughts.	4,10	Agree
16. I cannot ignore my worrying thoughts.	4,09	Agree
25. If I did not control a worrying thought, and then it happened, it would be my fault.	4,08	Agree
11. I do not trust my memory.	4,07	Agree
7. I have little confidence in my memory for words and names.	4,07	Agree
23. I pay close attention to the way my mind works.	4,07	Agree
13. My worrying is dangerous for me.	4,06	Agree
30. If I could not control my thoughts, I would not be able to function.	4,04	Agree
18. When I start worrying, I cannot stop.	4,02	Agree
10. I have little confidence in my memory for places.	4,03	Agree
17. My worrying could make me go mad.	4,02	Agree
24. I constantly examine my thoughts.	3,99	Agree
29. It is bad to think certain thoughts.	3,98	Agree
22. I am constantly aware of my thinking.	3,96	Agree
6. I need to worry in order to work well.	3,94	Agree
15. My worrying thoughts persist, no matter how I try to stop them.	3,92	Agree
27. I will be punished for not controlling certain thoughts.	3,91	Agree
14. I could make myself sick with worrying.	3,89	Agree
1. Worrying helps me to avoid problems in the future.	3,87	Agree
26. I should be in control of my thoughts all of the time.	3,79	Agree

General arithmetic average: 4,08 (Agree)

In Table 5, the arithmetic averages of the vocational school students' answers to the Metacognition Scale-30 (MCS-30) are rated on the scale from high to low. From the arithmetic averages of the answers of the students to the Metacognition Scale-30 (MCS-30), it was determined that the 3rd article stating '*Worrying helps me to sort out my thoughts in my mind.*' ($\overline{X}$ =4,45), the 4th article stating '*Worrying helps me cope.*' ($\overline{X}$ =4,34), and the 9th article stating '*I have a poor memory.*' ($\overline{X}$ =4,24) are the items with the highest arithmetic averages in the scale. In the light of the answers given to the scale items, it can be said that the students think that worrying helps to sort out an individual's thoughts, and brings about success, and they do not have confidence in their own memories.

Moreover, from the arithmetic averages of the answers of the students to the items of the Metacognition Scale-30 (MCS-30) in Table 5, it was determined that the 26th article stating '*I should be in control of my thoughts all of the time.*' ($\overline{X}$ =3,79), the 1st article stating '*Worrying helps me to avoid problems in the future.*' ($\overline{X}$ =3,87), and the 14th article stating '*I could make myself sick with worrying.*' ($\overline{X}$ =3,89) are the items with the

lowest arithmetic averages in the scale. In the light of the answers given to the scale items, it can be said that the students have low tendencies toward subjects such as taking control of

4. CONCLUSION AND RECOMMENDATION

4.1. Results

From the answers of the students participating in the research to the scale items, it was concluded that there is a statistically significant difference between female and male students in favour of female students in terms of their opinions about metacognitive skills according to gender variable. From the data obtained from the research, it can be said that female students are more careful about the use of metacognitive skills than male students. In a research on metacognitive learning made by Tunca & Alkın-Şahin (2014), a significant difference was found in favour of females. In some researches made, it was determined that gender does not affect metacognitive strategies (Aydın & Coşkun, 2011; Dilci & Kaya, 2012; Özsoy & Günindi, 2011).

It was concluded that there is no a statistically significant difference between the students who participated in the research, are in the 1st grade and 2nd grade in terms of their opinions about metacognitive skills according to the variable of grade level. In the light of the research data, it can be said that the students in the 1st grade and 2nd grade have similar views about the use of metacognitive skills. Also, in some researches made, it was determined that grade level does not affect metacognitive strategies (Demir & Özmen, 2011; Baykara, 2011).

It was concluded that there is no a statistically significant difference between the students of different age groups who participated in the research in terms of their opinions about metacognitive skills according to age variable. In the light of the research data, it can be said that the students of different age groups have similar views about the use of metacognitive skills.

From the answers of the students participating in the research and studying in different programs, it was concluded that there is a statistically significant difference between the students studying in the programs of Computer

thoughts, the help of worrying to avoid problems, being sick with worrying.

Programming (CP), Accounting and Tax Applications (ATA), and Radio and Television Programming (RTP) in favour of the students studying in the program of Computer Programming (CP); between the students studying in the programs of Child Development (CD), Accounting and Tax Applications (ATA), Fashion Design (FD), and Radio and Television Programming (RTP) in favour of the students studying in the program of Child Development (CD); between the students studying in the programs of Construction Technology (CT), Accounting and Tax Applications (ATA), and Radio and Television Programming (RTP) in favour of the students studying in the program of Construction Technology (CT) according to the type of program variable.

From the arithmetic averages of the answers of the students participating in the research to the scale items, it was determined that worrying helps to sort out the thoughts, and to cope with difficulties, and that the students do not have confidence in their own memories are the items with the highest arithmetic averages in the scale. Therefore, in the light of the students' answers to the scale items, it can be said that the students think that worrying helps to sort out an individual's thoughts, perceptions and ideas, and brings about success, and also, they do not have confidence in their own memories. According to Biggs (1988), metacognitive strategies increase the successes of students and teachers.

From the arithmetic averages of the answers of the students to the scale items, it was concluded that taking control of the thoughts, the help of worrying to avoid problems, and being sick with worrying are the items with the lowest arithmetic averages in the scale. Thus, in the light of the arithmetic averages of the students' answers to the scale items, it can be said that the students have low tendencies toward the subjects such as taking control of thoughts, the help of worrying to avoid problems, being sick with worrying.

The general arithmetic average of the answers of the students participating in the

research to the scale items coincides with (4.08; Agree) skill level, a little bit lower than expected (4.21-5.00; Strongly Agree). In a research made by Pilten (2008), it was determined that teachers do not have enough metacognitive knowledge. In the light of the conversations made with the students in order to pinpoint the reason for this situation, the conclusion was reached that the students have partial knowledge about meta-cognitive skills, and partially embrace them, but do not use their own metacognitive skills as expected.

4.2. Recommendations

In order that the students become aware of their own metacognitive skills, the importance of these skills in the modern world should be explained to them thanks to various trainings, and the awareness of them should be raised about metacognitive skills. Moreover, the importance of metacognitive skills, and the way metacognitive skills are effectively used and developed should be clearly explained to all individuals, and all these effective trainings should be given to all individuals at all stages of life beginning from primary education.

Metacognitive skills affect students' successes positively. Hence, the way students increase their own successes should be deter-

mined thanks to the researches which will be made, and trainings should be given to them according to the research results. Furthermore, various researches on worrying and awareness should be made, according to the research results, the parts of curricula which are required to change, should be changed.

Metacognitive skills provide self-knowledge to an individual. For this reason, trainings about the way students use and develop their own metacognitive skills should be given to all students thanks to the support of various institutions and organizations, and the awareness of them should be raised about their own personal powers, and they should be consciously trained.

In-service trainings about the way metacognitive skills are personally developed, and the way students develop their own metacognitive skills should be given to all teachers, and it should make them professional at metacognitive skills.

All curricula in schools should be revised according to students' metacognitive skills, the curricula which are required to change, should be regulated or designed all over again.

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