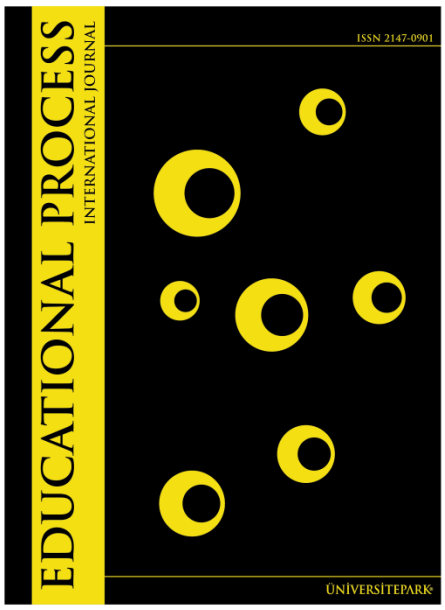

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The Relationship Between Metacognitive Skills and Motivation of University Students

AYTUNGA OGUZ and NERIMAN ATASEVEN

Abstract

The aim of study is to determine the relationship between metacognitive skills and motivation of students in the education faculty. Research in correlational survey method includes 520 university students. “Metacognitive Skills Scale” and “Academic Motivation Scale” are used for data collection. Descriptive statistics, Pearson Correlation Coefficient, t test, ANOVA were used for data analysis. According to findings, there is a positive and significant relationship in low level between metacognitive skills and IMTK, IMTA, IMES, EMID, EMIN, and EMER and a negative and significant relationship in low level between metacognitive skills and AMOT. A significant difference is found on students’ metacognitive skills according to grade, status of reading in a month and whether or not having taken a lesson on learning strategies. Furthermore, a significant difference in students’ EMID, EMIN, and AMOT according to gender and field, in IMTK, IMTA, IMES, and AMOT according to status of reading in a month and in IMTA and IMES according to whether or not having taken lessons on learning strategies was found.

Keywords: metacognition, metacognitive skills, motivation, preservice teacher, teacher training.

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Introduction

In this information society, students need to take responsibility for their own learning, and to be aware of how to do so. In our age, how individuals learn is more important than what they learn and students are expected to be able to learn to learn (Ozden, 2011). If students do so, they can plan, organize and evaluate the results of their learning, and perform better without someone' teaching them throughout their lives. Individuals' learning to learn can determine their learning needs, objectives, learning methods, techniques and materials and evaluate their learning (Savin-Baden & Major, 2004). Learning to learn requires development of individuals' metacognition skills and using these skills effectively and efficiently (Hoskins & Fredriksson, 2008; Taylor, 1999). In this context, learning to learn is related to metacognition and this process begins with the development of metacognition.

Metacognition is individuals' storing information in their mind, comprehending and relating it with other information and monitoring other cognitive activities (Flavell, 1979). Individuals' monitoring their learning effectively and making their metacognition active during learning develop their metacognitive skills. Metacognitive skills consist of skills in planning, evaluating and monitoring learning (Vrieling, Bastiaens, & Stijnen, 2012). Anderson (2002) defines metacognition as students' thinking what they know and don't know, and states that this skill is the key factor of learning. Individuals with these skills can monitor their learning; know how to spare time for their studying and the most effective way to followed. Additionally, when they cannot learn, they are aware of how they can solve the problems and how they can find and correct their mistakes. They can always keep their beliefs strong that they will be successful, even if they do wrong (Senemoglu, 2012). Metacognitive skills require individuals' thinking about their own thoughts (Taylor, 1999). They help individuals learn and know how they can learn (Slavin, 2013). In this way, students can make their own decision independently in a true way and in their own time; can organize their learning process in unique way and achieve their objectives. According to Pintrich (2002), metacognitive skills shouldn't be construed as a lesson to be taught, but should be given to students by integrating the content of different subject areas. Furthermore, the teacher should include how and where they teach these skills in a lesson plan. In literature, it is seen that metacognitive skills increase success (Álvarez, 2010; Jacobs & Paris, 1987; Martinez, 2006; Taylor, 1999), correlate with self-efficacy (Landine & Stewart, 1998; Moores, Chang, & Smith, 2006), develop critical thinking (Magno, 2010; Ku & Ho, 2010), problem-solving skills (Hacker & Dunlosky, 2003; Teong, 2003), and learning strategies (Anderson, 2002; Wittrock, 1988), and increase self-regulating skills (Vrieling et al., 2012).

As well as metacognition, one variable that affects learning is motivation (Landine & Stewart, 1998; Vrieling et al., 2012). Researchers state that students primarily should be motivated for learning to use their metacognitive skills and manage this process (Mayer, 1998; Winne & Baker, 2013; Rathert, 2012). So, if students' motivation for learning is low, it is not thought that they can make the effort for determining their learning goals, or choosing and using the methods, techniques and strategies and evaluating learning. Students exhibit positive attitude towards learning and become motivated as long as they discover their own learning way and see themselves as successful. Metacognitive skills help students discover individual learning difficulties, solve problems and be motivated (Paris & Winograd, 1990).

Motivation is an essential process for students to initiate and maintain learning activities occurring in context of a specific objective (Schunk, Pintrich, & Meece, 2008). Individuals may have not only different levels but also different kinds of motivation such as intrinsic and extrinsic motivation in the learning environment (Deci & Ryan, 1985). Intrinsic motivation expresses that learning occurs for the purpose of enjoyment and delight, while extrinsic motivation expresses that learning occurs with outsourced reasons such as penalty and rewards (Ryan & Deci, 2000). In the learning process, students' motivation should be balanced, both intrinsically and extrinsically (Deci & Ryan, 1985). When a student is motivated extrinsically, and sees that his/her expected result doesn't meet for his/her effort, motivation can decrease. One of the most effective way students can be motivated in the learning process is said to be making them go into the mysterious world of learning. According to Zimmerman, Bandura, and Martinez-Pons (1992), students' directing their learning process, determining learning goals, using appropriate strategies for accomplishing these goals and achieving success are very important features for their motivation. It is possible to mention about positive results of motivation in learning process. In literature, it is seen that motivation increases success (Eymur & Geban, 2011; Mayer, 1998; Ryan & Deci, 2000; Slavin, 2013), that it is related to self-efficacy (Bandura, 1982; Cerino, 2014) and epistemological belief (Paulsen & Feldman, 1999), and it increases the use of learning strategies (Liu, 2012; Witrock, 1988) and school belonging (Goodenow & Grady, 1993).

Students' motivation to learn, and in this way develop metacognitive skills, are among the factors for success. Teachers can be said to be the most important guide in this way for students. Teachers should be a model for students in using metacognitive skills (Martinez, 2006). Therefore, they can help students be active rather than passive learners (Taylor, 1999), be lifelong learners and responsible for their own learning in order to provide motivation. Teachers should be equipped with adequate knowledge and skills in order to help students use metacognitive skills and motivate. These knowledge and skills can be gained preservice through teacher training curriculums. In some research (Altindag, 2008; Dogan, 2013; Gunstone & Northfield, 1992; Vrieling et al., 2012), it is indicated that metacognitive skills of prospective teachers are insufficient. Askell-Williams, Lawson, and Murray-Harvey (2007) stated that prospective teachers skills suggested by contemporary educational theory, cannot be developed and they emphasized that learning environments in which students can be equipped with metacognitive knowledge should be designed for them to use the opportunities offered by educators. Furthermore, in some studies (Eymur & Geban, 2011; Jansen, 2009; Ligon, 2006), it is indicated that more research should be carried out to determine motivation level and effective ways for the motivation of prospective teachers. Investigation of metacognitive skills and motivation of prospective teachers can contribute to the development of these skills in teacher training. In literature, while there is some research on the relationship between metacognitive skills and motivation (Landine & Stewart, 1998; Mayer, 1998; Paris & Winograd, 1990; Winne & Baker, 2013), there is none on this topic with education faculty students in Turkey. In this research, it is aimed to investigate metacognitive skills and motivation according to different variables, and to determine the relationship between them. In accordance with this aim, answers are sought to the following:

- What is the level of students' metacognitive skills?

- Do students' metacognitive skills differ significantly according to gender, grades, field, and the number of books read monthly, and taking lessons on learning strategies?
- What is the level of students' motivation?
- Does student motivation differ significantly according to gender, grades, field, and the number of books read monthly, and taking lessons on learning strategies?
- Is there a significant relationship between students' metacognitive skills and their motivation?

Methodology

This research employs the correlational survey method and includes 520 students studying in the Faculty of Education of Dumlupinar University, Turkey. Of the participants, 406 (78.1%) are female and 114 (21.9%) are male. In terms of subject area, 90 (17.3%) of the participants are students of Primary School teaching, 93 (17.6%) from Turkish Language teaching, 97 (18.7%) from Social Science teaching, 92 (17.7%) from Preschool teaching, and 99 (19%) from Science teaching. As to their seniority, 178 (34.2%) are first grade students at the university, 132 (25.4%) are in the second grade, 95 (18.3%) in third grade, and 115 (22.1%) in fourth grade. Regarding book reading, 30 (5.8%) of the students read four or more books in a month, 83 (16.0%) read three books, 130 (25.0%) read two books, and 191 (36.7%) read one book. Whilst 73 (14.0%) of the students took lessons in learning strategies and techniques, 447 (86.0%) of them didn't.

In this research, the "Metacognitive Skills Scale (MSS)" to determine students' metacognitive skills (Altindag & Senemoglu, 2013), and the "Academic Motivation Scale (AMS)" (Karaguven, 2012) to determine students' motivation were used. MSS composed of 30 items has single factor. The Cronbach's Alpha reliability coefficient of MSS is .94, and for this research it is .89. AMS composed of 28 items has 7 factors. Cronbach's Alpha reliability coefficient of AMS is .87, and for this research it is .89. It is .79 for intrinsic motivation to know (IMTK) and .78 for this study; .74 for intrinsic motivation to accomplish (IMTA) and .70 for this study; .67 for intrinsic motivation experience stimulation (IMES) and .71 for this study; .79 for extrinsic motivation identified regulation (EMID) and .71 for this study; .75 for extrinsic motivation introjected regulation (EMIN) and .70 for this study; .73 for extrinsic motivation external regulation (EMER) and .58 for this study and .83 for amotivation (AMOT) and .74 for this study. Descriptive statistics to determine the students' metacognitive skills and motivation were used. A t-test for bilateral comparison, an ANOVA for multiple comparisons, and a Pearson's correlation coefficient for determining the relationship between the two variables (Pearson's r) were used. A significance level of 0.05 was adopted.

Findings

In this section, findings in accordance with aims of study are presented. Firstly, analysis of metacognitive skills and motivation according to some variables and then analysis for the relationship between these two variables are given. Descriptive statistics results about students' metacognitive skill show that the mean of students' metacognitive skills is $\bar{X}$=111.24 (S=14.26). Moreover, the maximum score is Max=150.00, and minimum score is Min=72.00. According to the findings of this research, there is no significant difference between metacognitive skills of female ($\bar{X}$=111.03; S=13.95) and male ($\bar{X}$=111.97; S=15.32)

students ($t_{(518)}$=.624; p>.05). But, there is a significant difference in students' metacognitive skills according to their grades ($F_{(3\text{-}516)}$=; p<.05) and a significant difference (p=.024) between students in 3rd grade ($\bar{X}$=114.27; S=15.90) and students in the 1st grade ($\bar{X}$=109.17; S=12.76) in favor of students in 3rd grade. There is no significant difference for students in other grades. It is also seen in the research that there is a significant difference in students' metacognitive skills according to the number of books they read in a month ($F_{(4\text{-}515)}$=3.024; p<.05), with a significant difference (p=.015) between students reading three books a month ($\bar{X}$=113.52; S=14.61) and students reading no books ($\bar{X}$=106.67; S=15.02) in favor of those reading three books a month. There is no significant difference for the other students. According to the research findings, there is a significant difference between students' metacognitive skills according whether or not they take lessons on the subject of learning strategies ($t_{(518)}$=3.938; p<.05). However, there is no significant difference between students' metacognitive skills according to this field ($F_{(5\text{-}514)}$=.852; p>.05).

Descriptive statistics results about students' motivation show that highest subscale of motivation of students is EMID ($\bar{X}$=22.10; SS=4.77). Furthermore, students' motivation level in AMOT is low ($\bar{X}$=9.04; SS=5.48). According to research, there is a significant difference in EMID ($t_{(518)}$=2.838; p<.05), EMIN ($t_{(518)}$=1.976; p<.05), AMOT ($t_{(518)}$=4.568; p<.05), but no significant difference in IMTK ($t_{(518)}$=1.368; p>.05), IMTA ($t_{(518)}$=1.322; p>.05), IMES ($t_{(518)}$=.430; p>.05), or EMER ($t_{(518)}$=1.694; p>.05) according to gender. There is no significant difference in any of the subscales according to grades [IMTK ($F_{(3\text{-}516)}$=1.110; p>.05), IMTA ($F_{(3\text{-}516)}$=1.010; p>.05), IMES ($F_{(3\text{-}516)}$=1.526; p>.05), EMID ($F_{(3\text{-}516)}$=1.506; p>.05), DMKI ($F_{(3\text{-}516)}$=1.669; p>.05), EMER ($F_{(3\text{-}516)}$=1.867; p>.05), AMOT ($F_{(3\text{-}516)}$=1.957; p>.05)]. According to the findings of this research, there is a significant difference in IMTK ($F_{(5\text{-}514)}$=2.249; p<.05), EMID ($F_{(5\text{-}514)}$=2.583, p<.05), EMIN ($F_{(5\text{-}514)}$=4.306; p<.05), or AMOT ($F_{(5\text{-}514)}$=4.313; p<.05); but no significant difference in IMTA ($F_{(5\text{-}514)}$=1.424; p>.05), IMES ($F_{(5\text{-}514)}$=2.086; p>.05), or EMER ($F_{(5\text{-}514)}$=.450; p>.05) according to the fields. The significant difference in EMID is between students from Turkish Teaching ($\bar{X}$=22.84; S=5.01) and Social Science ($\bar{X}$=20.32; S=5.28), in favor of students from Turkish Teaching (p=.003). In EMIN, it's between students from Turkish Teaching ($\bar{X}$= 18.84; S= 6.02) and Social Science ($\bar{X}$=15.01; S=6.07) field, in favor of students from Turkish Teaching (p=.003), and also between students from Turkish Teaching and Primary School Teaching ($\bar{X}$=15.73; S=5.64) fields, in favor of students from Turkish Teaching (p=.001). In AMOT, it is between students from Turkish Teaching ($\bar{X}$=7.08; S=4.24) and Social Science fields ($\bar{X}$=10.61; S=5.94), in favor of students from Social Science, and also between students from Turkish Teaching and Science Teaching ($\bar{X}$=9.33; S=5.80) fields, in favor of students from Science Teaching (p=001). There is no significant difference for students of other fields.

According to the research, there is a significant difference in IMTK ($F_{(4\text{-}515)}$=5.180; p<.05), IMTA ($F_{(4\text{-}515)}$=4.700; p<.05), IMES ($F_{(4\text{-}515)}$=11.110; p<.05), EMID ($F_{(4\text{-}515)}$=5.136; p<.05), and AMOT ($F_{(4\text{-}515)}$=6.277; p<.05); but no significant difference in EMIN ($F_{(4\text{-}515)}$=1.941; p>.05) or EMER ($F_{(4\text{-}515)}$=2.220; p>.05) according to the number of books they read in a month. The significant difference in IMTK is between students who read no books ($\bar{X}$=19.24; S=5.46) and those who read two books ($\bar{X}$=21.47; S=4.82) and three ($\bar{X}$=22.50; S=4.52) books, in favor of students reading two and three books in a month (p=.000). It is also between students who read one book ($\bar{X}$=20.61; S=4.69) or three books, in favor of students reading three books in a month (p=.000). In IMTA, it is between students reading no books ($\bar{X}$=14.45; S=5.01), those

who read two books ($\bar{X}$=16.51; S= 5.46) and three ($\bar{X}$=17.85; S=5.04) books, in favor of students reading two and three books in a month (p=001). In IMES, it is between students who read no books ($\bar{X}$=14.50; SS=5.04) and those who read one ($\bar{X}$=16.15; S=5.01), two ($\bar{X}$=18.38; S=5.05) and three ($\bar{X}$=18.54; S=5.56) books, in favor of students reading one, two, and three books in a month (p=000). In EMID, it is between students who read no books ($\bar{X}$=20.16; S=4.71) and those who read one book ($\bar{X}$=22.51; S= 4.31) or three ($\bar{X}$=22.86; S=4.50) books, in favor of students reading one or three books in a month (p=000). In AMOT, it is between students who read no books ($\bar{X}$=11.36; S=5.48) and students who read one ($\bar{X}$=8.72; S=5.28), two ($\bar{X}$=8.10; S=5.02) or three ($\bar{X}$=8.26; S=5.30) books, in favor of students reading no books in a month (p=.000). According to the findings, there is a significant difference in IMTA ($t_{(518)}$=3.222; p<.05) and IMES ($t_{(518)}$=2.321; p<.05); but no difference in IMTK ($t_{(518)}$=1.316; p>.05), EMID ($t_{(518)}$=1.815; p>.05), DMKI ($t_{(518)}$=.935; p>.0), EMER ($t_{(518)}$=1.924; p>.05) and AMOT ($t_{(518)}$=.880; p>.05) according to whether or not they take lessons on learning strategies.

According to the findings of the research, Pearson's correlation coefficient (r) is .33 between the metacognitive skills and IMTK; .32 between the metacognitive skills and IMTA; .27 between the metacognitive skills and IMES; .22 between the metacognitive skills and EMID; .20 between the metacognitive skills and EMIN; .14 between the metacognitive skills and EMER; -.14 between the metacognitive skills and AMOT. There is a positive significant relationship in low level between the metacognitive skills and IMTK, IMTA, EMID, IMES, EMER, EMIN and a negative, significant relationship in low level between the metacognitive skills and AMOT. The highest relationship is between the metacognitive skills and IMTK.

Conclusion and Discussion

According to the research, the mean value of students' metacognitive skills is 111.24. The level of students' metacognitive skills can be said to be high, considering that the mid-score of the MSS is 150 (Altindag & Senemoglu, 2013). This result can be said to be positive, because students who use their metacognitive skills effectively and are more aware of what, how and when they can learn know the key for their learning (Álvarez, 2010; Ozden, 2011; Senemoglu, 2012). Furthermore, students with high level metacognitive skills have high levels of self-efficacy (Landine & Stewart, 1998; Moores et al., 2006), as well as critical thinking skills (Ku & Ho, 2010; Magno, 2010).

According to research, there is no significant difference between female and male students' metacognitive skills. The research performed by Memnun and Akkaya (2009), Ozsoy and Gunindi (2011) also support the results of the current research. However, Bidjerano (2005), Carr and Jessup (1997), and Niemivirta (1997) indicated that gender does have a significant effect on metacognition. Contradiction between research findings can be explained by cultural differences. According to this research study, students' metacognitive skills differ significantly according to grades. Some research studies (Anderson, 2002; Hacker & Dunlosky, 2003; Kuhn, 2000) indicated that metacognitive skills develop according to age and experience. So, it is therefore an expected result that metacognitive skills differ significantly according to grades. Findings in the research of Memnun and Akkaya (2009), and Ozsoy and Gunindi (2011) also support these findings.

According to the findings of this research, there is no significant difference between students' metacognitive skills according to their field (subject discipline). These skills can be

similar for students in all fields. This result could be because of the fact that the way learning environments are organized and the way some factors affecting metacognitive skills are applied are similar. Research of Okcu and Kahyalioglu (2007) support this research finding, while that of Bedel and Cakir (2013) and Coban (2012) do not. In this research, it is seen that students' metacognitive skills differ according to the number of books they read a month. Considering that the reading habit develops metacognition (Ozbay & Bahar, 2012), this result can be said to be expected. In this research, students' metacognitive skills differ according to whether or not they take lessons on learning strategies. Using learning strategies can be dependent to metacognitive skill development (Hoskins & Fredriksson, 2008; Senemoglu, 2012) and in this context, students that take lessons in learning strategies have a high level of metacognitive skills (Anderson, 2002; Taylor, 1999; Wittrock, 1988). In this process, the role of teacher is to help their students think about their learning process and the role of students is to take the responsibility of their learning by thinking, monitoring and evaluating their learning process (Álvarez, 2010). Doing some exercise to realize these roles in teacher training curriculum help prospective teachers develop their metacognitive skills and to be autonomous learners. They can be conscious teachers in how information is obtained, kept in mind and related with other information and can be equipped with knowledge and ability about effective teaching strategies (Slavin, 2013).

According to the research, the highest motivation of students is EMID. If it is thought that EMID steers individuals to achieve individual benefits (Vallerand et al., 1992), students are said to be motivated mostly when they achieve individual benefit. Furthermore, students can be said to have high levels of motivation in IMTK, EMID and EMER, and medium level in IMTA, IMES, and DMKI. In this context, students can be said to be motivated due to outsourced reasons. This result is similar with findings of Gomleksiz and Serhatlioglu (2013). Considering that students will be successful when they are intrinsically and extrinsically motivated (Eymur & Geban, 2011; Slavin, 2013; Terzi, Unal, & Gurbuz, 2012; Kubiatko & Arik, 2014), high and medium level motivation of students in the current study indicates that students will be successful.

According to research, a significant difference was found in EMID, EMIN and AMOT according to gender, but wasn't found in IMTK, IMTA, IMES and EMER. Eymur and Geban (2011) found a significant difference in students' motivation in IMES, but didn't find in other subscales. Spittle, Jackson, and Casey (2009), found that motivation doesn't differ significantly according to gender, but Ligon (2006) and Terzi et al. (2012) found that it differs. According to the research, there isn't any significant difference in students' motivation according to grades. It is expected that students have positive experiences about lessons and become more motivated. In the current study, however, it was found that levels of students' intrinsic and extrinsic motivation does not differ according to grades. In literature, some research (Guven, 2013; Keklik & Keklik, 2012) found significant difference according to grades but some (Ligon, 2006; Spittle et al., 2009; Terzi et al., 2012) didn't. According to the research, a significant difference was found in IMTK, EMID, EMIN and AMOT, but no difference in IMTA, IMES and EMER according to field. Demir and Ari (2013) found no significant difference in motivation according to field, yet Sahin and Cakar (2011) did. According to the research, a significant difference was found in IMTK, IMTA, EMID and AMOT, but no difference in EMIN and EMER according to status of book reading each month. Furthermore, the highest motivation is in IMTK according to status of book reading

each month and the more books the students read, the higher the motivation level they have. In these subscales, students become motivated to learn to explore and try to understand new information (Vallerand et al., 1992). So it can be said that students read books to obtain new information. A significant difference was found in IMTA and IMES, but wasn't found in IMTK, EMID, EMIN, EMER or AMOT according to the status as to whether or not they take lessons about learning strategies. Furthermore, students that take these lessons have higher motivation levels. In some research (Liu, 2012; Wittrock, 1988), students that have learning strategies are more motivated to learn. Therefore, it is natural for students that take lesson about strategies and in this way have more information about strategies and use them to become motivated. It can be said that taking lessons about learning strategies both develops metacognitive skills and increases motivation.

According to the research, there is a significant relationship between metacognitive skills and motivation. Findings in the research of Landine and Stewart (1998), and Vrieling et al. (2012) are parallel with this finding. It is an expected result, because individuals that plan, monitor and evaluate their learning have higher motivation levels (Mayer, 1998; Winne & Baker, 2013). Metacognitive skills help students become more successful (Jacobs & Paris, 1987; Kuhn, 2000) and a taste of success can be said to increase their motivation.

In teacher education curriculums, designing activities that can develop students' metacognitive skills can be said to help them learn to learn and to increase their motivation. In curriculum, teachers should allocate time for learning strategies teaching, reflective thinking activities and they should also encourage students to read books. Teaching learning strategies can be said to develop students' metacognitive skills. It could also be investigated how some variable activities composed of different techniques affect students' metacognitive skills and motivation. Furthermore, students metacognitive skills and motivation can be investigated with different variables such as self-regulation, self-efficacy, problem-solving skills, reflective thinking.

Notes

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