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The levels of metacognitive awareness of primary teacher trainees

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Abstract

The aim of this study is to determine the level of metacognitive awareness of primary teacher trainees and to examine whether there is a difference according to class levels and gender or not. In accordance with this purpose, the inventory of metacognitive awareness was applied to 263 candidate teachers (157 female, 106 male), studying at Uludag University. At the end of the study, it was understood that the majority of the primary teacher trainees had high level of metacognitive awareness. Furthermore, there appeared no significant difference among the scores of candidate teachers' metacognitive awareness according to gender, but there appeared significant difference among the scores of candidate teachers' metacognitive awareness according to class levels.
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Keywords: The level of metacognitive awareness; primary teacher trainees; gender; class levels.

1. Introduction

Metacognition has been one of the most concentrated concepts among researches because of many reasons. One of these reasons is that metacognition is one of the most important factors that affect problem solving behaviors of individuals (Swanson, 1990; Artzt and Armour-Thomas, 1992; Fitzpatrick, 1994; Kuiper, 2002). The other one is that metacognition is an extremely important structure, affecting individual learning process (Akın, Abacı and Çetin, 2007). Furthermore, metacognition has a main role in the self-regulation, required to succeed in learning (Lucangeli and Cornoldi, 1997). Kuiper (2002) states that learners with a certain level of self-regulation and strategy of metacognition get a better academic achievement. He also emphasizes that metacognition, as only learned once, encourage reflective thinking, provide responsibility, and build self-confidence to make decisions quickly. Moreover, it facilitates critical and creative thinking. Schraw and Graham (1997) see metacognition as an important factor in effective learning, for it provides individuals with following and arranging their own cognitive performances. According to them, performance of metacognition increases the awareness level in learning, enabling to employ the existing strategies effectively and getting the processes of caution better.

The concept of "metacognition" was suggested, for the first time, by Flavell in 1976. Flavell (1976: 232), describes metacognition as "knowledge and cognitive about cognitive phenomenon", and "individual's knowledge about his/her own cognitive process, and employing this knowledge to inspect cognitive processes". According to Flavell (1979), metacognition is the individual's awareness of how he learns and what he does, employment of proper knowledge to gain his ends; the ability to employ cognitive skills that are required in an ordinary test, the

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knowledge of which strategies be employed with which goals, and the assessment of individual processes before and after performance. Furthermore, it is a cognitive activity or knowledge that arranges any items of cognitive functions (Flavell, 1993).

Following Flavell's studies, this concept has been examined by a lot of researchers, and generally described as "thinking of thought" (Blakey and Spence, 1990; Livingston, 1997; Akın, Abacı and Çetin, 2007). However, different definitions for this notion have arisen in time. In spite of this different metacognition definitions, many of the researches (Schraw and Sperling-Dennison, 1994; Schraw and Moshman, 1995; Pintrich, 2002 et all.) view the knowledge of cognition and the regulation of cognition as the basic elements/components of metacognition.

Knowledge of cognition refers how much learners learn with their own memories and learning methods (Sperling, Howard, Staley 2004), and their cognitions or what they know about cognition as a general (Akın, Abacı and Cetin, 2007). It is the knowledge that is stockpiled by the individual which has different cognitive goals and skills and attempted different cognitive experiences, and which is composed of interaction among variants of individual, task and strategy (Flavell, 1979; Flavell, 1993; Livingston, 1997). Regulation of cognition implies a row of metacognitive activities which help individual control his/her learning and thinking, and associate with both mutually, (Thomas and McRobbie, 2001) in other words, it implies strategies or skills that stimulate comprehension, and enable to accomplish the objective (Flavell, 1979).

Recently, individuals should carry out their studies schemingly and regularly, and also have knowledge of their own cognitive processes in order to be successful, concurrently with their busy learning activities (Akın, Abacı and Cetin, 2007) Therefore, all of these are elements related to metacognitive awareness. Moreover, metacognitive awareness of individuals is regarded as an important factor in increasing of their success, their learning throughout their life span, their creative and critical thinking, and building self-confidence. Consequently, it has very critical importance to determine the level of metacognitive awareness of teacher trainees, and develop their metacognitive awareness. The aim of this study is to determine the levels of metacognitive awareness of primary teacher trainees, and examine whether these levels change according to some variables such as gender or class levels. For this purpose, we seek to find answers to the following study questions:

1) Is there a significant difference among scores of metacognitive awareness of primary teacher trainees according to gender?

2) Is there a significant difference among scores of metacognitive awareness of primary teacher trainees according to the class levels?

2. Method

In this chapter, we put emphasis on the type of the study, collection and analysis of data. While examining problems, we used survey design.

2.1. Population and Sample of the Study

The population of the study is formed by students studying in the department of Primary School Teacher Training in Education Faculties at Turkish Universities. The sample of the study is formed by total of 263 students in the Department of Primary School Teacher Training in the Education Faculty at Uludag University, 157 of whom are female, and 106 of whom are male students. 63 of these students are freshmen, 68 of them are sophomores, 62 of them are juniors, and 70 of them are seniors. The range of these students according to gender and class levels is given in Figure 1.

Figure 1. Distribution of primary teacher trainees according to gender and class levels

		Class Levels				Total
		freshmen	sophomores	juniors	seniors	
Gender	Female	35	42	32	48	157
	Male	28	26	30	22	106
	Total	63	68	62	70	263

2.2 Data collection

The data of the study were acquired by means of the application of the Inventory of Metacognitive Awareness (IMA), developed by Schraw and Dennison (1994), and adopted into Turkish by Akın, Abacı and Çetin (2007) on students. The Inventory of Metacognitive Awareness is a total 52-item of inventory, and each item rated on 5-Point Likert type scale which ranges from "1-always true" to "5-always false" to report respondents' level of agreement with 52 items. The original form of MTI consists of two main (knowledge of Cognition and regulation of cognition) dimensions (Schraw and Dennison, 1994). For the entire inventory, coefficients of internal consistency reliability were calculated to be .95 (Akın, Abacı ve Çetin, 2007).

Construct and concurrent validity of the Metacognitive Awareness Inventory in Turkish was analyzed. After applying the inventory of IMA which was adapted to Turkish, Metacognitive Awareness Inventory developed by Yurdakul (2004) was applied to the sample of the research, which is composed of primary teacher trainees for the concurrent validity of the inventory. The correlation between these two applications was determined as concurrent validity and the result of the correlation between applications was .95. Exploratory factor analysis was utilized in order to analyze construct validity of the inventory and it was analyzed whether there are main dimensions of knowledge of cognition and regulation of cognition being in the original form of the inventory in the factor analysis. For the item discrimination of IMA, item-test correlation and comparison of sub-group and over-group with a rate of 27% were used. By calculating item-test correlation, correlation coefficient of Pearson multiplication of moments was determined according to total point, and T-test was used by determining the item points of sub-over groups with rate of 27%. For the reliability of internal consistency and test-retest reliability coefficients were calculated. Internal consistency reliability coefficient of IMA was .93.

The highest point to be obtained in IMA prepared as 5 graded Likert type was 260 and the lowest point was 52. High points obtained from the inventories not including negative item showed high degree of awareness. By dividing total point obtained from the inventory into the number of items the level of metacognitive awareness of the related individual can be found. It is possible to say that an individual gaining under 2.5 point from IMA has low metacognitive awareness and the one who gains over 2.5 point has high metacognitive awareness (Akın, Abacı and Çetin, 2007).

2.3 Analysis of data

The primary teacher trainees were given total 30 minutes to answer the Inventory of Metacognitive Awareness. Data gathered, was analyzed by means of a packaged program. At this stage, Descriptive Statistics Methods were applied, while determining the levels of metacognitive awareness of candidate teachers. To determine the first problem an independent t-test was applied, while one way ANOVA test was applied to determine the second one. Moreover, Tukey's Test was applied with the aim of determining between which class levels the differences of their levels of metacognitive awareness fall within.

3. Findings

In this chapter, we allow for the analyses, carried out with the aim of determining the levels of metacognitive awareness of primary teacher trainees. Figure 2 indicates the range of the levels of metacognitive awareness of primary teacher trainees according to gender and class levels.

Figure 2. The range of level of metacognitive awareness of primary teacher trainees, according to gender and class levels

The Level of IMA	Gender	Class Levels				Total
		Freshmen	Sophomores	Juniors	Seniors	
High	Female	16	28	23	36	103
	Male	12	20	19	20	71
	Total	28	48	42	56	174
Low	Female	19	14	9	12	54
	Male	16	6	11	2	35
	Total	35	20	20	14	89

When examined the responses of primary teacher trainees regarding inventory items, it was confirmed that 174 of the primary teacher trainees (%66.1) had high level of metacognitive awareness, while 89 of them (%33, 9) had a lower level of metacognitive awareness. Furthermore, when examined the number of candidates according to their class levels, it was observed that less than half of the freshmen had high level of metacognitive awareness, while three fourths of seniors were observed to have high level of metacognitive awareness.

We applied the independent t-test in order to observe whether there is a significant difference among the levels of metacognitive awareness of primary teacher trainees. Figure 3 indicates the results of the independent t-test.

Figure 3. The results of t-test regarding scores of metacognitive awareness according to gender

Gender	N	X	S	sd	T	p
Female	157	186	23.13			
Male	106	183.83	27.02	261	2.26	.13

As is seen from the Figure 3, it was established that there was not a significant difference among the scores of metacognitive awareness of male and female primary teacher trainees ($t(261) = 2.260$; $p > .05$). It can be reported that the scores of metacognitive awareness of male primary teacher trainees (186) and the scores of female primary teacher trainees (183.83) were nearly similar, and the scores of both groups indicated a homogenous range according to the standard deviation figures. One-way ANOVA test was applied to observe whether there is a significant difference among the levels of metacognitive awareness of primary teacher trainees, according to class levels. Figure 4 indicates the results of ANOVA test according to class levels.

Figure 4. The results of ANOVA test regarding the scores of metacognitive awareness of primary teacher trainees

	Total of Squares	Sd	Average of Squares	F	p	Significant Difference
Sub-over groups	76674.08	3	25558.02			1. and 2. degree, 2.
Sub-group	254163.8	259	981.32	26.044	.000	and 3. degree, 3. and
Total	330837.9	262				4. degree, 4. and 4. degree

According to the results of the analysis, there was a significant difference among the scores of metacognitive awareness of primary teacher trainees($F_{(3,259)} = 26.058$, $p < .05$). In other words, the scores of metacognitive awareness of primary teacher trainees change according to the class levels significantly. The Tukey's Test was applied to determine the differences between which class levels. According to the results of this test, it was confirmed that the scores of metacognitive awareness of sophomores (151), juniors (156), and seniors (167) were more affirmative than the scores of metacognitive awareness of freshmen.

4. Discussion and Result

Metacognition is an extremely important notion affecting learning process of individuals (Akın, Abacı, Çetin; 2007) and it plays the main role in self-regulation which is necessary to be successful in learning. In addition, it is seen as one of the important factors affecting problem solving behaviors of individuals. In recent years, taking this importance of metacognition in learning into account, it is important to develop metacognitive awareness of students in primary school. Furthermore, primary school teachers have much to do to develop this awareness. For instance, primary school teachers are effective in making students productive learners by making sure that the students have responsibility on their own learning process and participate in metacognitive process (Williamson, 1996). This situation resulted in the need of analyzing the metacognitive awareness of primary school teachers who will educate the future generations. For this reason, in the research the level of metacognitive awareness of class teachers were found out and it was researched whether these levels show a significant difference or not according to gender and class levels.

The findings of the research revealed that most of the primary teacher trainees (%66.1) have high level metacognitive awareness and it is understood that the gender has no role in point of metacognitive awareness. This finding of the research is parallel to the findings of Fitzpatrick (1994) in his research, but it does not correspond to the findings of the researches carried out by Kazu and Ersözlü (2007) and Monktari and Sheroy (2001). It can be inferred from this situation that more comprehensive researches are needed in this subject.

Another finding of the research is that metacognitive awareness levels of primary teacher trainees have a significant difference according to class levels. It is found out that there is a significant increase in metacognitive awareness points of class teachers from first grade to upper grades. This points out that the education of teaching they have affects the development of metacognitive awareness affirmatively. It is thought that especially the teaching classes, which candidate teachers have at the upper grades, have effects on creating metacognitive awareness.

If primary teacher trainees comprehend the significance of metacognitive awareness and have education on metacognitive awareness, they can use metacognition effectively in their experiences as a teacher. Therefore, classes which will help primary teacher trainees have metacognitive awareness can be designed and applied. By bringing contents related to its teaching to the classes, teacher trainees can get information on how they can teach these abilities and they can make practice.

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