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The metacognitive evaluation of student teachers' interpersonal relationship dimensions

Aysem Seda Onen [a], Canan Kocak [a]*

[a]*Education Faculty, Hacettepe University, Ankara, 06800, Turkey*

Abstract

This study focused on the determination of the effects of student teachers' positive and negative metacognitive beliefs on their interpersonal relationships. The sampling consisted of 230 student teachers studying at Hacettepe University, Faculty of Education. The data were collected through "Interpersonal Relationship Dimensions Scale" developed by Imamoglu (2009) and the "Metacognition Scale" developed by Cartwright-Hatton and Wells (1997), which was adapted to the Turkish sampling by Tosun and Irak (2008). The findings of this study, which is based on the hypothesis that the interpersonal relations of student teachers are closely related to their metacognitions, would contribute to the determination of the connection between student teachers' interpersonal relationships and their metacognition.

Keywords: Interpersonal relationships, metacognition, student teachers

1. Introduction

Metacognition, which stands for our beliefs and knowledge about our mental processes, is an important concept in cognitive theory enabling to increase learning to the highest level possible (Benjamin & Bird, 2006). In fact, metacognition is the awareness of an individual about his/her own cognitive skills and use them when s/he comes face to face with a problem (Krätzig & Arbuthnott, 2009). In other words, metacognition is the "cognition about cognition" or "thinking about thinking" (Veenman et al., 2006, Shamir, Mevarech & Gida, 2009). Individuals evaluate their cognitive processes according to some positive or negative beliefs (metacognitions), worries, memories and attention skills. The metacognitive evaluations of individuals may cause them to have different attitudes towards their interpersonal relationships. Thanks to their relationships with other people in their environments, individuals could continue their existence and address their basic needs. The interpersonal relationship could be defined as "mutual emotional interactions and behaviors experienced at different densities from familiarity to friendship that deriving from different needs and developing between two or more people (Imamoglu & Aydin, 2009). Developing the metacognitive sills of university students would enable them to get adapted to the daily life conditions as well as improve their existential skills. Therefore; determination of the metacognitive levels of university students would contribute to the quality and value of in-service training programs. This would also assist the social development in long term (Demir & Ozmen, 2011). In the light of these, this study

* Canan Koçak. Tel.: 0312 297 67 83; fax: 0312 297 86 00
E-mail address: canan.kck@gmail.com

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aims to determine the effects of student teachers' positive and negative metacognitive beliefs on their interpersonal relationships.

2. Method

In the light of the opinion that interpersonal relationships are linked to the metacognition is a research in scan model on the content of the relationship between the interpersonal relationships and metacognitions of student teachers and how these differ according to the types of program they are training at. The study was participated by 230 student teachers from the Computer and teaching Technologies Dept ITE (48), Physics Dept (46), Chemistry dept (48), Biology Dept (46) and Math Dept (42) of Hacettepe University, Faculty of Education. The data were collected through the "Interpersonal Relationship Dimensions Scale" developed by Imamoglu (2009) and the "Metacognition Scale (α value is 0.93)" developed by Cartwright-Hatton and Wells (1997) and adapted to the Turkish sampling by Tosun and Irak (2008).

3. Findings

3.1. Findings Regarding The Metacognition Levels of Student Teachers

The first section of the study, the averages of the scores of student teachers obtained from each sub-dimension of the Metacognition Scale and their standard deviations were analyzed. Prior to the analysis, these conclusions, which are thought to be important, are displayed on Table 1.

Table 1. Analysis of the scores obtained from the sub-dimensions of Metacognition Scale according to the program types

	ITE		Math		Biology		Physics		Chemistry		Total	
	x	**sd**	***x***	**sd**	***x***	**sd**	***x***	**sd**	***x***	**sd**	***x***	sd
Positive Beliefs	2.37	.60	2.28	.47	2.41	.51	2.09	.43	2,32	.42	2.29	.48
Cognitive Confidence	2.40	.52	2.17	.59	2.28	.55	2.26	.56	2.53	.57	2.33	.56
Uncontrollability	2.53	.44	2.57	.49	2.50	.45	2.44	.57	2.56	.52	2.52	.49
Cognitive Awareness	2.76	.35	2.80	.36	2.75	.39	2.89	.50	2.90	.36	2.81	.40
The Need For Keeping The Thoughts Under Control	2.61	.40	2.60	.44	2.57	.43	2.37	.52	2.69	.43	2.57	.45

As Table 1 displays that student teachers of Biology received the highest average for Positive Beliefs. It was the highest for student teachers of chemistry in Cognitive Confidence, Cognitive Awareness and The Need for Keeping the Thoughts under Control. The highest average scores observed for Math teachers were for Uncontrollability. In order to determine whether these differences observed for the average scores of student teachers were statistically significant, ANOVA analysis was done, the results of which were displayed on Table 2.

Table 2. Single dimensional variance analysis of metacognition scale scores according to program types

Sub-dimensions of Metacognition Scale		**Sum of Squares**	**df**	**Mean Square**	**F**	**p**
Cognitive Confidence	**Between Groups**	3.540	4	.885	2.82	.02
	Within Groups	70.534	225	.313		
	Total	74.074	229			
The Need For Keeping The Thoughts Under Control	**Between Groups**	2.549	4	.637	3.13	.01
	Within Groups	45.692	225	.203		
	Total	48.240	229			

The results of the comparison made between the scores of student teachers regarding the Metacognition Scale according to their program types; and as displayed in Table 2, significant differences were observed between the scores of Cognitive Confidence and The Need for Keeping the Thoughts under Control sub-dimensions [$F_{(4-225)}$ =

2.82 and 3.13; p<.05]. Scheffe test was administered in order to find out the program types that caused this difference concluded that math and Chemistry student teachers had metacognitive differences in Cognitive Confidence Sub-dimension, while Physics and Chemistry student teachers had metacognitive differences in the sub-dimension of The Need for Keeping the Thoughts under Control. No significant differences were observed in the other sub-dimensions of the Metacognition Scale.

3.2. Findings regarding the Interpersonal Relationship Dimensions of Student Teachers

In order to determine the interpersonal relationship dimensions of student teachers studying at five different program types and with the aim of making statistical comments, the average scores and their standard deviations were calculated. The findings were displayed on Table 3.

Table 3. The analysis of the Interpersonal relationship Dimensions Scale scores according to program types

	ITE		Math		Biology		Physics		Chemistry		Total	
	$\bar{x}$	sd	$\bar{x}$	sd	$\bar{x}$	sd	$\bar{x}$	sd	$\bar{x}$	sd	$\bar{x}$	sd
Empathy	3.43	.55	3.55	.47	3.40	.51	3.43	.55	3.55	.47	3.40	.51
Approval Dependence	3.31	.41	3.41	.45	3.27	.40	3.31	.41	3.41	.45	3.27	.40
Trust For Others	3.23	.38	3.34	.41	3.13	.48	3.23	.38	3.34	.41	3.13	.48
Emotional Awareness	3.31	.44	3.39	.39	3.25	.40	3.31	.44	3.39	.39	3.25	.40
Total	3.43	.55	3.55	.47	3.40	.51	3.43	.55	3.55	.47	3.40	.51

As Table 3 displays the average scores of student teachers obtained from the scale are different according to their academic program types. These data, being quite different from each other were then analyzed through ANOVA and the results were displayed on Table 4.

Table 4. Single-direction variance analysis made according to the academic program types of student teachers on their average scale scores

Interpersonal Relationship Dimensions		Sum of Squares	df	Mean Square	F	p
Approval Dependence	**Between Groups**	1.584	4	.396	2.42	.04
	Within Groups	36.734	225	.163		
	Total	38.317	229			
Emotional Awareness	**Between Groups**	2.481	4	.620	2.99	.02
	Within Groups	46.619	225	.207		
	Total	49.100	229			

As Table 4 displays, the analysis concluded that there are significant relationships between the dimension scores of student teachers for Approval Dependence and Emotional Awareness [$F_{(4-229)} = 2.42$ and 2.99, $p<.05$]. In order to determine the academic programs that this difference is observed the Sheffe test was applied. According to the results, significant relationship was found between the average scores of student teachers studying at Physics Education and Chemistry Education within Approval Dependence and Emotional Awareness factors.

In order to respond to the question that whether the sub-dimensions of the Metacognition Scale and The Scale of Interpersonal Relationship Dimensions were related to each other, Pearson Correlation Analysis was used. The findings were displayed on Table 5.

Table 5. The pearson correlation of sub-dimensions of interpersonal relationship dimensions scale and the metacognition scale

Interpersonal Relationship Dimensions	Sub-dimensions of Metacognition Scale					
	Positive beliefs	Cognitive confidence	Uncontrollability	Emotional awareness	Emotional awareness	Total
Empathy	.028	.021	-.027	.147(*)	-.008	.063
Approval dependence	-.18(**)	-.137(*)	.075	.017	-.111	-.104

*At the significance level of 0.05. ** at the significance level of 0.01, N= 230, * significant $p<.05$.

According to these values displayed on Table 5, the sub-dimension of Empathy was found to have a positive relationship with the sub-dimension of Cognitive Awareness. The Approval Dependence sub-dimension was observed to have significant negative relationships with the sub-dimensions of Positive Beliefs and Cognitive Confidence. The sub-dimensions apart from the above-mentioned dimensions were not found to be statistically significant.

4. Conclusion and Discussion

In the light of the opinion This study was designed upon the content of the relationship between student teachers' interpersonal relationships and metacognitions as well as their differences according to the academic program types they attend. Metacognition is a multi-dimensional structure (Alexander, Johnson, Albano, Freygang & Scott 2006). Although assessing the multi-dimensional structure of the metacognition is considered as a challenging operation (Tosun & Irak, 2008), in order to determine the sub-dimensions that are used by student teachers' more effectively, each structure was analyzed individually. The analysis concluded that student teachers of Biology expressed more positive beliefs about the statement that anxiety helped planning or problem solving. Positive and negative emotional experiences that student teachers face in their education lives make them think that they could create the motivation that is required to solve their problems through anxieties. According to Krätzig and Arbuthnott (2009), metacognition is the awareness of cognitive skills and utilization of this structure in problem solving. On the other hand, student teachers of Chemistry had higher average scores in the sub-dimension of Cognitive Confidence, which stands for the confidence of an individual regarding his/her own memory and attention skills as well as the sub-dimensions of Cognitive Awareness and the Need for Keeping the Thoughts under Control, which reflect the individuals' working on their thought processes continuously. Additionally, looking at the scores of student teachers for each sub-dimension, the highest scores were observed to be listed under the Cognitive Awareness dimension and student teachers of Chemistry scored the highest amongst the group. In the study by Dogan (2009), this result was referenced to the academic area, which requires high level of cognitive awareness. Demir and Ozmen (2011) concluded in their study that receiving high scores from the Cognitive Awareness sub-dimension is a result of the effects of higher education on student teachers' Cognitive Awareness levels. Parallel to this, the laboratory applications that Chemistry students participate in, force them to keep their cognitive confidence and awareness alive continuously.

Student teachers of Math performed the highest scores in the Uncontrollability sub-dimension amongst the sampling group. Individuals achieve better when they are aware of their cognitive processes and they could consciously observe, organize, inspect and guide as well as they could keep under control (Yurdakul & Demirel, 2011). Student teachers of Math attend their academic programs as a result of high scores in the university placement tests, with greater achievement rates. Therefore, the control dimension of the cognitive processes is used more effectively by them when compared to student teachers of other academic program types. Their high scores in this dimension are reflections of their previously formulized metacognitive control mechanisms and their active utilization. Moreover, student teachers of Chemistry were observed to have metacognitive differences in the Cognitive Confidence together with Math teachers and they had similar differences with Physics teachers in The Need for keeping the Thoughts under Control dimension. Determination of the fact that student teachers had high metacognition levels and especially that they had high levels of Cognitive Awareness in this study and in other research studies in the literature (Demir & Ozmen, 2011; Tuysuz, Karakuyu & Bilgin, 2008; Saban, 2008) is a pleasing finding regarding the future of education. Along with this opinion, evaluating the interpersonal relationships of student teachers according to their metacognitions would contribute to the world of education. The interpersonal relationship dimensions of student teachers have been analyzed and various sequences and differentiations were observed for each dimension. Student teachers of physics, having scored very high for the Approval Dependence and Emotional Awareness, were observed to be aware of their feelings however they needed confirmation by others. Similarly, some other research studies have also concluded that student teachers of different academic program types could have different levels of interpersonal relationships, which is supportive of this study (Erginsoy, 2002; Yilmaz, 2010). Similarly, Trust for Others is the dimension that student teachers of Math scored really high. The trust for the instructor as an important actor of socialization during the university education years

and the importance that close relationships gain (Kurt, 2010) could have created this dominance in student teachers of Math. Biological components are also considered in evaluating these differences between the student teachers in the sampling group. Biological components not only affect the interpersonal relationships of individuals but also cause individual differences in their attitudes and behaviors (Steiner-Pappalardo & Gurung, 2004). At the final stage of the research, the hypothesis that whether the interpersonal relationships of student teachers were related to their metacognitions or not has been analyzed. The analysis concluded that the sub-dimension of empathy had significant positive relationship with Cognitive Awareness sub-dimension, whereas the relationship between the Approval Dependence and Positive Belief s as well as Cognitive Confidence was found to be significant at the negative direction. Many similar studies have also concluded that interpersonal relationship and different dimensions of metacognition had positive or negative relationships with various variables (Ersoy, 2002; Yilmaz, 2010; Safranci, 2010). That is because the cultural, ethic and biological features of student teachers reflected on their metacognition patterns as well as their interpersonal relationships, which leads to some important relationships at some dimensions. The relationship between the metacognition and interpersonal relationships shall be analyzed in terms of other variables in order to contribute to the education literature.

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