



## Educational Process: International Journal

ISSN 2147– 0901 (Print) Journal homepage: [www.edupij.com](http://www.edupij.com)

**EDUCATIONAL PROCESS: INTERNATIONAL JOURNAL**  
**EDUPIJ / VOLUME 5 / ISSUE 4 / WINTER / 2016**

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**To cite this article:** Coskun, M. V., & Altinkurt, Y. (2016). The Relationship between Values and Critical Thinking Dispositions of Pre-Service Teachers. *Educational Process: International Journal*, 5(4), 298-312.

**To link to this article:** <http://dx.doi.org/10.22521/edupij.2016.54.4>

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## The Relationship between Values and Critical Thinking Dispositions of Pre-Service Teachers

MUSTAFA VOLKAN COSKUN and YAHYA ALTINKURT

### Abstract

This study aimed to reveal the relationship between personal values and critical thinking disposition of pre-service teachers. The study was designed using the survey model. The population of this study consisted of pre-service teachers studying at the Faculty of Education at Mugla Sitki Kocman University, Turkey, during the 2015-2016 academic year. The sample of the study consisted of 570 pre-service teachers who were selected by using disproportionate cluster sampling technique. The data of the study were obtained through the administration of the Florida Critical Disposition Scale (UF/EMI) and University Students Values Scale (USVS). USVS was developed within the scope of the present study. Descriptive statistics, t-test, ANOVA, and multivariate regression analysis were used to analyze the data. The study revealed that the pre-service teachers attributed highest value to sensitivity. These values were identified to be followed with respect to diversity, trustability, and responsibility. In addition, the level of students' critical thinking dispositions was found to be at the average level. Furthermore, the values of students explained approximately one-third of the critical-thinking dispositions. The values of sensitivity, responsibility and respect for diversity were determined to be the significant predictors of students' critical-thinking dispositions.

**Keywords:** critical thinking dispositions, values, values scale, university students.



DOI: 10.22521/edupij.2016.54.4

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## Introduction

Criticisms regarding the conception of traditional education are mentioned more extensively each day. These criticisms are mainly aimed at the conception of traditional education shaping students. Scientists, who especially conduct studies on the field of critical pedagogy, have frequently asserted that the conception of traditional education, and the perennialism and essentialism philosophies of education on which traditional education is based, aim to bring up individuals who are monotype, rote-learners and unquestioning. The common ground of these criticisms is that the conception of traditional education detracts students from critical thinking and that the education used functions rather as a formalizing tool (Yilmaz & Altinkurt, 2011). In fact, education should be a tool for freedom, rather than formalization.

Contrary to the conception of traditional education, contemporary education which promotes progressive and existentialist philosophies of education, aims to contribute to individuals in order for them to explore their potential and abilities, to improve them and, through this approach, to realize themselves. In contemporary education, schools are the fields for producing critical knowledge. In this sense, schools should promote collective imaginations, namely critical thinking which mentions establishing social justice for all groups, and ending all discrimination such as exploitation, racism and sexism (McLaren, 2007). In order for this aim to be actualized, qualified teachers are required who are subject to universal values and who can think critically; because, one of the fundamental variables determining the quality of education, and maybe the most important, is the quality of the teachers. It is not only the knowledge and skills related to the teaching profession of pre-service teachers, in other words teachers of the future, but also their values and approaches towards education have a significant influence on each and every aspect of the quality of education (Oguz, Altinkurt, Yilmaz, & Hatipoglu, 2014). In this regard, this study investigates the effect of pre-service teachers' values on their critical thinking dispositions.

Critical thinking is a type of thinking which is grounded on an individual questioning the thinking processes of his self and others in making sense of his own world (Kilic & Sen, 2014), which presents dependence on the conditions of the current situation and which requires certain skill and responsibility (Lipman, 1987). In the Delphi Project carried out by the American Philosophical Association, the aim was to reach a consensus on the definition of the concept of critical thinking. Accordingly, they defined critical thinking as a decision-making activity in which evidences, concepts, methods, criteria and conditions are considered, and which depends on a purpose concluded by making interpretations, analyses, evaluations and inferences (Facione, 1990). Based on this definition, it can be asserted that critical thinking requires individuals to question, make inferences and approach incidents through a critical attitude instead of just perceiving incidents as they are seen. The personal characteristics of critically thinking individuals include being curious, faithful towards the prejudices of individuals, eager to rethink, being regular against complicated problems, behaving meticulously to reach information, being rational in selecting criteria, and modest and persistent in achieving results (Facione, 1990, 2000; Facione & Facione, 1996). Such characteristics might provide opportunities for individuals to organize the information they acquire in the educational environments, to reach new information, and to make important decisions. At the same time, critical thinking skill is also a common characteristic of self-realized individuals (Aydin, 2009).

Critical thinking skills have a rather major importance for individuals to make right decisions, not only in their daily lives but also in their professional lives. On the other hand, critical thinking disposition is defined as the condition of having a continuous internal motivation to use critical thinking skills in decision making and problem solving (Facione, Facione, & Giancarlo, 1996). However, having critical thinking disposition does not mean that this behavior will be actualized. When the related literature is investigated (Facione, 1990, 1998; Halpern, 1996; Norris, 1985; Paul, Binker, Jensen, & Kreklau, 1990), it can be observed that critical thinking is not solely comprised of cognitive skills. Therefore, it is required that environments which can reveal critical thinking dispositions of individuals should be ensured and such dispositions of individuals should be promoted by creating a critical culture. However, culture is directly proportionate to democratization. In a culture in which fear and anxiety dominates, prevalent critical thinking cannot be mentioned; hence, in order for critical thinking to develop, an appropriate climate should be created. When considered in regard to educational organizations, administrators and teachers have important roles and responsibilities in the creating of such a climate. First, administrators in the whole of institutions and classroom teachers must reflect critical thinking in their behaviors (Alkin-Sahin & Gozutok, 2013; Facione et al., 1996).

The conclusions obtained as a result of critical thinking depend on particular criteria, standards and valid reasons. Criteria-based critical thinking ensures that it is discriminated from (non-critical) thinking, which is random, unstructured and noncritical. An ordinary thinking style leans on assumptions, preferences, estimates and deductions, whereas critical thinking is built upon hypotheses, evaluations, predictions and logical inferences (Lipman, 1987). According to Lipman (1987), individuals who have critical thinking skills are able to think in a reflective way by questioning, instead of just learning the specified information. In addition, individuals' having these so-called skills are in a rather important position in constituting democratic societal structure. Even though educational institutions of all levels have significant roles in creating a critical society, the place of higher education institutions is indisputably rather special, as they are often centers of free thinking. In supporting this opinion, Giroux (2009) remarks that higher education level, it should not be content with redounding students with just a general education, but that students should also gain critical thinking habits and a social responsibility passion.

As discussed, there appears to be a great deal of personal and environmental factors affecting the critical thinking dispositions of individuals. The individuals' personal characteristics, educational level, moral development level and their value judgments within this framework are some of the factors. When the theoretical explanations are taken into consideration, it is expected that there is a relationship between pre-service teachers' values and their critical thinking dispositions. Values as criteria affecting the behaviors and decisions of individuals, are inevitable in affecting how individuals think and make sense of themselves, society or the universe and also to affect the questioning power of individuals related to their attitudes towards authority figures, external motivators, dogmatism and prejudices (Alkin-Sahin, Tunca, Altinkurt, & Yilmaz, 2016). In this present study, it is aimed to statistically test the relationship which is determined to theoretically exist between the values pre-service teachers possess and their critical thinking dispositions.

Rokeach (1973) describes values as the beliefs of individuals concerning their ideal behavior types and life purposes. Besides, according to Schwartz (1994), values are terminal purposes which are the determinants of principals in the lives of individuals or social

structures and which also have various importance levels. Moreover, according to another definition, values are standards which dominate the preferences, requests, purposes, attitudes, decisions and behaviors of individuals (Tunca, 2012). Values can lead the way for individuals related to their behaviors and their ways of thinking; they can also contribute to their adaptation to social norms and expectations. Values are thinking outputs which individuals are mostly unaware of, but they can have a significant influence on individuals' lives. This influence of values can be explained by the fact that values are the determinants of the preferences, evaluations, behaviors and relationships (Ozbey & Saricam, 2016; Yilmaz, 2008). Schwartz (1994) identified the general features of values as appealing to the attention of social environment, directing an individual to a certain behavior by motivating and dominating him affectively, determining the standards in order to adjudicate about a behavior, and being acquired through both dominant social environment and learning experiences of individuals.

It can be stated that the most important feature of values is that they direct the actions of individuals. By this means, individuals reflect the values in their lives as they demonstrate behaviors appropriate for the values and avoid improper behaviors. Values play an important role for an individual in expressing himself to his environment, in evaluating other individuals and his own social environment, and also in comprehending their behaviors (Turan & Aktan, 2008). The values an individual possesses determines the behaviors of that individual, whereas the common values adopted by society specifies the social behaviors (Tunca, 2012). Thereby, these so-called values adopted by society can provide information for individuals on which behaviors are approved in society or not. The accepted values are closely related to socio-economic development and democratization levels of societies. For instance, in socio-economically and democratically developed societies, values such as free thought or action, innovation, alteration and equality come into prominence, while in undeveloped societies, behaviors like conformity, traditionalism and power come to the fore (Schwartz & Sagie, 2000). According to the research of Hofstede (2005), Turkey is a country whose power distance is quite high. The perception of high power distance might result in the inequalities of society being considered or accepted as a normal and usual phenomenon (Hofstede, 1980, 1983).

Some researchers intended to identify universally valid values which are considered to be important by different societies. However, due to the extensivity of the concept, the issue of values is dealt with in different ways in the literature. In one of the most extensive studies in this field, Schwartz (1994) conducted a study with approximately 26,000 individuals from 44 countries to determine the typology of universally valid values. According to that study, a value typology consisting of ten value types, namely 'traditionalism, power, conformity, achievement, hedonism, security, self-direction, benevolence, universalism, and stimulation' were identified. However, in this present study, the values are dealt with in four dimensions; sensitivity, respect for diversity, trustability, and responsibility.

There are some studies which investigate the values possessed by pre-service teachers (Oguz, 2012; Sari 2005) and their critical thinking dispositions (Buran, 2016; Saglam & Buyukuysal, 2013). Additionally, some other studies were identified which examine the relationships of critical thinking dispositions (Alper, 2010; Colucciello, 1999; Cubukcu, 2006; Ekinci & Aybek, 2010; Memduhoglu & Keles, 2016; Oguz & Saricam, 2016; Stupnisky, Renaud, Daniels, Haynes, & Perry, 2008; Tumkaya, Aybek, & Aldag, 2009) and values (Coskun & Yildirim, 2009; Dilmac, Bozgeyikli, & Cıkılı, 2008; Dilmac, Deniz, & Deniz, 2009; Dunder,

2013; Yazici, 2011; Yilmaz, 2013) separately with various variables. However, no studies were found in the related literature that have investigated the values of pre-service teachers and their critical thinking dispositions. In this regard, the purpose of this present study is to investigate the relationship between the personal values of pre-service teachers and their critical thinking dispositions. In accordance with this general purpose, answers to the following research questions were sought in this study:

- To what extent do the pre-service teachers take to the values of sensitivity, responsibility, respect for diversity, trustability into account in their actions?
- What is the level of pre-service teachers' critical thinking dispositions?
- Do the pre-service teachers' personal values and their critical thinking dispositions differ in terms by their gender and grades?
- Do the pre-service teachers' personal values significantly predict their critical thinking dispositions?

## Methodology

The study was designed according to the survey model. The population of this study consisted of 3,258 pre-service teachers studying at the Faculty of Education at Mugla Sıtkı Kocman University, Turkey, during the 2015-2016 academic year. In identification of the sample, disproportionate cluster sampling technique was utilized. The sample size to represent the population was calculated as 344 for a 95% confidence level. However, taking possible imprecise completion of scales into consideration, 700 pre-service teachers were intended to be reached in order for a sufficient number of pre-service teachers from different departments to be represented in the sample. Within the scope of this present study, data was collected from 611 pre-service teachers; with analyses conducted with 570, due to their availability and practicality.

The sample of the study consisted of, 373 female students (65.4%) 197 male students (34.6%), 254 first graders (44.6%), 118 second graders (20.7%), 127 third graders (22.3%) and 71 fourth graders (12.5%).

### *Data Collection Instruments*

For data collection, the Florida Critical Thinking Disposition Scale (UF/EMI-University of Florida Engagement, Maturity and Innovativeness Critical Thinking Disposition Instrument) and the University Students' Values Scale (USVS) were applied. The UF/EMI was adapted into Turkish by Kilic and Sen (2014). It has 25 Likert-type items oriented at determining critical thinking dispositions. The scale consists of three dimensions, which are engagement, maturity and innovativeness. The items in the instrument are constructed on a five point Likert scale ranging from 1- Totally disagree to 5- Totally agree Strongly agree. There are no items which are scored reversely in the scale. A high score obtained from the scale indicates that the critical thinking disposition is high. A total score can be obtained from the whole scale. Kilic and Sen conducted the validity and reliability study of the scale on students from secondary schools. As the intention of this present study is to determine the critical thinking dispositions of pre-service teachers, the validity and reliability studies were conducted again for the sample of this study. In this framework, the construct validity of the scale was maintained by using explanatory (EFA) and confirmatory factor analysis (CFA). The KMO value was calculated as .89 and Bartlett Sphericity test result was found to be significant [ $\chi^2=6369.32$ ;  $p=.00$ ]. For EFA, Varimax vertical rotation was applied. The factor load values of

the scale were determined to range from .60 to .77 in the dimension of *Engagement*. The ratio of the variance explained by this factor was identified to be 22.94%. In addition, in the dimension of *Maturity*, the factor load values were found to range from .62 to .72. The ratio of the variance, which this factor was explained on its own, was determined to be 14.02%. In the dimension of *Innovativeness*, the factor load values were identified to range from .45 to .84. This factor explained 14.93% of the total variance by itself. On the other hand, the ratio of the variance explained by all three factors was determined to be 51.95%. In this present study, the goodness of fit indices calculated by CFA were determined as:  $\chi^2/sd$  (962.01/270)=3.56, GFI=.88, AGFI=.86, RMSEA=.07, CFI=.96, IFI=.96, NFI=.94, NNFI=.95, RFI=.94. In order to test the reliability of the scale, Cronbach's Alpha coefficients were examined. These coefficients were calculated as .90 for the dimension of engagement, .81 for the dimension of maturity, .84 for the dimension of innovativeness, and .88 for the whole scale.

Another data collection instrument applied in this study was the University Students' Values Scale (USVS), which was developed by researchers within the scope of the present study. In the development process of the scale, first draft items were formed based on a very detailed literature review. As a result, a draft scale consisting of 60 items was created. For the construct validity of the items in the scale, expert opinion was consulted regarding their recommendations, and some arrangements were made. As a result of this process, the number of the items was decreased to 48. After that, in order to control the features of comprehensibility of the items, the scale was presented to the opinions of 20 pre-service teachers who did not take place in the sample group of this study. Taking these opinions into consideration, the scale with 48 items was prepared to be applied. Besides, in order to identify the agreement level of participants related to the items, a five-point, Likert-type scale was utilized, comprising of the choices ranging from (1)-Never (I never do), to (5)-Always (I always do). To ensure construct validity of the scale, Explanatory Factor Analysis (EFA) was conducted on the data collected. The KMO value was calculated as .89 and Bartlett Sphericity test result [ $\chi^2=11718.13$ ;  $p=.00$ ] was identified to be significant. Additionally, for EFA, Varimax vertical rotation was utilized. In EFA, in order to determine whether the items should take place in the scale or not, the lower bound of the factor load value is accepted as .30 (Tabachnick & Fidell, 2001). However, the lower bound was determined to be .10 for the items which gave load to more than one factor. The items which did not fulfill these requirements were removed from the scale. As a result of the first factor analysis, it was observed that the items of the scale were accumulated in 10 factors whose eigenvalue was above 1. This so-called 10-factored structure of the scale was determined to explain 57.87% of the total variance.

After investigating the structure that emerged as a result of the analysis, it was decided that the scale should consist of four factors and thereby the data were analyzed once again. These aforementioned four factors were 'sensitivity, responsibility, respect for diversity, and trustability'. Upon making this decision, the contribution of the factors to the total variance, scree plot diagram and the feature of the factors' comprehensibility (Ozdamar, 2004) were considered. In the factor analysis process, the factor load values and overlapping items were investigated, the items which could not fulfill the criteria were omitted from the scale and the same procedure was followed again. In omitting items from the scale, the overlapping items were considered first, followed by items whose factor load value was low (Cokluk, Sekercioglu, & Buyukozturk, 2012). Moreover, items not consonant with other items in the

factor were also removed from the scale. As a result of this procedure, 26 items were removed from the scale and the final form of the scale had a total of 22 items. EFA was conducted again with these 22 items. For the USVS of 22 items, the KMO value was calculated as .89 and Bartlett Sphericity test result [ $\chi^2=4916.63$ ;  $df=231$ ;  $p<.00$ ] was identified to be significant. Besides, 11 items in the scale were reversely scored.

For EFA, Varimax vertical rotation was applied. The first factor of the scale, *sensitivity* had six items (e.g: When I see a person who damages the nature, I warn him; When I encounter a disabled person, I try to help him in case he needs) and the factor load values were determined to range from .60 to .73, and the total item correlations ranged from .49 to .61. The ratio of the variance explained by this factor was identified to be 14.03%. Besides, in the factor of *responsibility* there were three items (e.g: I do put off the things needed to be done on time; I voluntarily participate in the jobs which require a joint responsibility) and the factor load values ranged from .72 to .87, whereas the total item correlations ranged between .51 and .72. This factor explained 9.68% of the total variation on its own. Moreover, the factor of *respect for diversity* had four items (e.g: I do not make a racial discrimination among people; I do respect my friends who have different lifestyles) and the factor load values were identified to range from .66 to .77, while the total item correlations were determined to be between .43 and .62. The ratio of the variance explained by this factor itself was found to be 10.77%. Additionally, there were nine items (e.g: When I like a property entrusted to me, I use it; I do tell a lie in order to get rid of a difficult situation) in the last factor of the scale, *trustability*, and the factor load values were found to range from .64 to .77, while the total item correlations were identified to be between .59 and .71. The ratio of the variance explained by this factor itself was found to be 22.69%. The ratio of variance explained by all the factors together was identified to be 57.17%. The goodness of fit indices calculated by CFA in this study was determined to as:  $\chi^2/sd$  ( $986.76/203$ )=4.86, GFI=.93, AGFI=.91, SRMR=.045, RMSEA=.05, CFI=.98, IFI=.98, NFI=.96, NNFI=.97, RFI=.95. As the results of CFA revealed that the model was acceptable, it was not considered necessary to make any other arrangements. For the trustability of the scale, the Cronbach's Alpha coefficients were utilized. These coefficients were calculated as .89 for the dimension of sensitivity, .78 for responsibility, .72 for diversity, .90 for the dimension of trustability, and .87 for the total scale.

#### *Data Analysis*

In the data analysis, descriptive statistics, t-test, ANOVA and multiple regression analysis were conducted. For significant F values, LSD test, one of the multiple comparison tests was utilized to determine the source of the difference. Before regression analysis, the assumptions of the analysis were tested. In this regard, extreme value analysis, normality of the distribution and the multicollinearity problem were investigated. In determining the extreme values, z scores ( $z<3$ ) were calculated. On the other hand, in order to identify the multiple extreme values, Mahalanobis distances were computed. In addition, the normality of the distribution was tested by using the coefficients of kurtosis and skewness and these coefficients were observed to value between +1 and -1. Finally, so as to identify whether or not there was a multicollinearity problem, variance inflation factor (VIF) and unstandardized regression coefficients (B) were utilized (Cokluk, 2010).



## Results

In this section, in accordance with the purposes of the study, first of all the descriptive results about the values pre-service teachers and their critical thinking dispositions are presented.

Pre-service teachers take sensitivity ( $M=4.27$ ,  $S=.58$ ) and respect for diversity ( $M=4.24$ ,  $S=.77$ ) values into account for their actions and behaviors at a very high level. The values of trustability ( $M=3.82$ ,  $S=.91$ ) and responsibility ( $M=2.89$ ,  $S=.94$ ) respectively followed these so-called dimensions. Although the importance attributed to sensitivity and respect for diversity values are at a very high level, trustability the pre-service teachers' trustability is average whereas their responsibility values were found to be low. Moreover, in terms of the variable of gender, the values pre-service teachers have differed significantly in the dimensions of sensitivity [ $t_{(568)}=3.78$ ;  $p<.05$ ], responsibility [ $t_{(568)}=2.32$ ;  $p<.05$ ], respect for diversity [ $t_{(568)}=3.83$ ;  $p<.05$ ] and trustability [ $t_{(568)}=3.31$ ;  $p<.05$ ]. The female pre-service teachers' levels of sensitivity, responsibility, respect for diversity and trustability are higher than male pre-service teachers. In addition, according to the grade variable, the values pre-service teachers possess has not differed significantly in the dimension of responsibility [ $F_{(3-566)}=1.64$ ;  $p>.05$ ]. However, according to the aforementioned variable, there are significant differences in the dimensions of sensitivity [ $F_{(3-566)}=3.34$ ;  $p<.05$ ], respect for diversity [ $F_{(3-566)}=2.62$ ;  $p<.05$ ] and trustability [ $F_{(3-566)}=2.64$ ;  $p<.05$ ]. The difference in the dimension of sensitivity was between first grade pre-service teachers, and third and fourth grade pre-service teachers. The sensitivity levels of third and fourth graders have been found to be higher. Besides, while pre-service teachers' respect for diversity increase by the grade variable, the statistically significant difference are between second and third graders. Third graders' levels related to respect for diversity are higher. Similarly, the trustability levels of third and fourth graders were higher than first and second graders. However, the statistically significant difference was indicated to be between second and third graders. The trustability level of third graders was higher, when compared to others.

Another purpose of this study was to determine the critical thinking dispositions of pre-service teachers. Pre-service teachers' critical thinking dispositions are at an average level ( $M=3.83$ ,  $S=.47$ ). The scores pre-service teachers attained from critical thinking dispositions are at a close level with each other in the dimensions of engagement ( $M=3.83$ ,  $S=.50$ ), maturity ( $M=3.87$ ,  $S=.53$ ) and innovativeness ( $M=3.81$ ,  $S=.51$ ). Besides, in terms of gender variable, pre-service teachers' levels of critical thinking dispositions do not differ significantly, not only in the dimensions of engagement [ $t_{(568)}=1.37$ ;  $p>.05$ ], maturity [ $t_{(568)}=.68$ ;  $p>.05$ ] and innovativeness [ $t_{(568)}=.41$ ;  $p>.05$ ], but also in the total scores [ $t_{(568)}=.57$ ;  $p>.05$ ]. Similarly, according to the pre-service teachers' critical thinking dispositions has not differed significantly by grade both in the dimensions of the scale, namely engagement [ $F_{(3-566)}=2.33$ ;  $p>.05$ ], maturity [ $F_{(3-566)}=.75$ ;  $p>.05$ ], innovativeness [ $F_{(3-566)}=1.09$ ;  $p>.05$ ], and in the total scores of the scale [ $F_{(3-566)}=1.65$ ;  $p>.05$ ].

The final purpose of this study was to identify to what extent the values of pre-service teachers predicted their critical thinking dispositions. The analysis was conducted on the total scores of critical thinking dispositions. The results related to the so-called analysis are demonstrated in Table 1.

**Table 1.** Regression analysis results for the prediction of critical thinking disposition

<i>Variable</i>	<i>B</i>	<i>Std. Error</i>	$\beta$	<i>t</i>	<i>p</i>	<i>Zero-order r</i>	<i>Partial r</i>	<i>VIF</i>
Constant	1.72	.143	-	12.01	.00	-	-	-
Sensitivity	.36	.035	.426	10.23	.00	.51	.40	1.33
Responsibility	.05	.018	.100	2.58	.01	.15	.11	1.16
Respect for Diversity	.12	.025	.198	4.95	.00	.36	.21	1.24
Trustability	-.03	.021	-.039	.95	.34	.20	.04	1.33
R=.54	R <sup>2</sup> =.30		F <sub>(4-565)</sub> =57.05, p<.01					

In Table 1, the zero-order and partial correlations between the values possessed by pre-service teachers and their critical thinking dispositions have been investigated. It has been identified that there are positive and average level of relationships between critical thinking dispositions of pre-service teachers and their levels of sensitivity ( $r=.51$ ), and also respect for diversity ( $r=.36$ ) whereas positive and low level of relationships were determined between their critical thinking dispositions and the values of responsibility ( $r=.15$ ), and also reliability ( $r=.20$ ). When the other variables are constant, it has been identified that there is a positive and average level of relationship between the critical thinking dispositions of pre-service teachers and their value of sensitivity ( $r=.40$ ), while there are positive and low level of relationships between their critical thinking dispositions and their value of responsibility ( $r=.11$ ), and also respect for diversity ( $r=.21$ ). On the other hand, no relationship has been determined between pre-service teachers' value of reliability and their critical thinking dispositions. Besides, it has been indicated that the pre-service teachers' values explained 30% of their critical thinking dispositions. According to the standardized regression coefficient ( $\beta$ ), the predictor variables' relative order of importance on critical thinking dispositions is as sensitivity, respect for diversity and responsibility, respectively. When the t-test results regarding the significance of regression coefficients are taken into account, it can be stated that the values, except from reliability, are rather significant predictors of critical thinking dispositions of pre-service teachers.

## Conclusion and Discussion

In this study, it has been intended to determine the relationships between the pre-service teachers' values and their critical thinking dispositions. First of all, the pre-service teachers' values, have been identified. The pre-service teachers think that in their actions the take the values of sensitivity and respect for diversity into account at the uttermost. They value are followed respectively by, reliability and responsibility. It has been also indicated that although the pre-service teachers' levels of having the values of sensitivity and respect for diversity are very high, their reliability is at an average level while their responsibility level was low. In the related literature, the studies which are oriented at determining the values possessed by pre-service teachers concluded that pre-service teachers had the values of benevolence, universality and security the most, whereas the values they had the least were those of conformity and achievement (Bulut, 2012; Dilmac et al., 2008, 2009; Dundar, 2013; Oguz, 2012). The fact that pre-service teachers' very high level of the values of sensitivity and respect for diversity might ensure them to actualize the expected roles in an active way in the future, to deal with the problems closely and work accordantly with their colleagues and students. Besides, these values might also contribute for development of democratic values to be developed in teachers. According to the study of

Yazici (2011), conducted on pre-service teachers at social studies teaching civic education department, it was concluded that the pre-service teachers had democratic values at a considerably high level. Similarly, in the study of Yilmaz (2011), it was also determined that pre-service teachers had democratic values at a high level. However, according to the results of this present study, the fact that pre-service teachers have the value of responsibility at a low level is a vital problem. Because teaching is a kind of profession which have responsibilities not only towards students but also towards the society, and the profession requires that these so-called responsibilities should be carried out in an effective way.

Moreover, it was determined that according to gender variable, the pre-service teachers' values have differed significantly in the dimensions of sensitivity, respect for diversity and reliability. The levels of female pre-service teachers' values of sensitivity, responsibility, respect for diversity and reliability are higher compared to the male pre-service teachers. In the literature, there encountered to be some studies promoting this result. It was identified that, according to gender variable, there were significant differences in the study of Yilmaz (2013) in terms of the dimensions of honesty and sharing whereas a significant difference was also observed in the dimensions of conformity and security in Bulut's (2012) study. Similar to this present study, the opinions of female pre-service teachers were found to be more positive in that study. The reason why female pre-service teachers have more positive opinions might result from the fact that females generally have more positive attitudes towards teaching profession due to the social stereotypes and hereby, they feel themselves closer to this profession.

In addition, pre-service teachers' the values has not differ significantly in the dimension of responsibility by grades. However, the pre-service teachers' values have differed significantly in the dimensions of sensitivity, respect for diversity and reliability. It has been revealed that the higher the levels of pre-service teachers' grades are the higher the levels of possession of the values of sensitivity, respect for diversity and reliability. Besides, it was indicated in the studies of Dilmac et al. (2008, 2009) and Bulut (2012) that there were significant differences in the values of participants according to the variable of grade. According to Dilmac et al. (2008), the opinions of students studying at higher grades related to the dimensions of self-direction, universalism, benevolence, and security were determined to be more positive.

The fact that pre-service teachers have more positive opinions as long as their grades increase can be regarded as an apprehensible condition. Thanks to the education that pre-service teachers have and the interaction taking place in this process, this might increase their levels of respecting for diversity, and as a result they might be more aware of the values which their profession requires. This result can be described as encouraging as it can be asserted that the education pre-service teachers have contributes to their values however this contribution is not regarded to be at a sufficient level. In order for low level values possessed by pre-service teachers be developed, some work is required so that students might especially develop responsibilities and trustabilities.

The other purpose of this study is to determine the critical thinking dispositions of pre-service teachers. Hence, the critical thinking dispositions of pre-service teachers have come out at a moderate level. The pre-service teachers' scores for the dimensions of the engagement, maturity and innovativeness are closer to each other. In the literature, California Critical Thinking Skills Test was utilized in a great deal of studies so as to determine the critical thinking dispositions of pre-service teachers. When criteria of the California

Critical Thinking Skills Test are taken into consideration, the critical thinking dispositions of pre-service teachers are found to be at a low level. Similarly, in the literature, it was also concluded that the critical thinking dispositions of teachers or pre-service teachers were determined to be either at a low level (Alkin-Sahin et al., 2016; Cetinkaya, 2011; Guven & Kurum, 2008; Saglam & Buyukuysal, 2013; Tumkaya, 2011; Tural & Secgin, 2012) or at an average level (Alper, 2010; Kucuk & Uzun, 2013).

Furthermore, according to the variable of gender, the critical thinking dispositions of pre-service teachers did not differ significantly by gender both in the dimensions of engagement, maturity and innovativeness, and also in the total scores. There are also some studies promoting this result in the related literature. In terms of gender variable, the following studies identified that there were no significant differences in pre-service teachers at the department of Music Teaching (Kucuk & Uzun, 2013), and of Social Sciences and Science and Technology Teaching (Tural & Secgin, 2012). However, in the related literature, there appears to be some studies which concluded that female pre-service teachers (Besoluk & Onder, 2010; Cetinkaya, 2011) or male teachers (Cokluk-Bokeoglu & Yilmaz, 2005; Kartal, 2012; Oguz & Saricam, 2016; Saglam & Buyukuysal, 2013) had more positive opinions related to critical thinking dispositions. Thereby, it is rather difficult to reach a generalization concerning whether or not critical thinking dispositions of pre-service teachers differ significantly according to the gender variable. Hence, a meta-analysis study which investigates the effect of demographic variables on critical thinking dispositions and skills might provide significant contributions to the related literature.

Additionally, it was indicated that in terms of the grade variable, the critical thinking dispositions of pre-service teachers have not differed significantly in the dimensions of engagement, maturity and innovativeness, and also in the total scores. It is a quite remarkable result that it has not contributed to their critical thinking dispositions, even though the variable of grade ensured positive contributions for pre-service teachers' values. However, it can be understood that critical thinking dispositions, which are generally found at a low level on pre-service teachers, have not increased according to the variable of grade. This result of the study was corresponded by the studies of Buran (2016), Ekinci and Aybek (2010). The universities have a rather important place in raising individuals who can think critically, by maintaining different opinions and viewpoints to reveal. Thereby, the increase in pre-service teachers' critical thinking dispositions at the higher grades depends on universities' carrying out their own responsibilities.

The final purpose of this study is to determine to what extent the values of pre-service teachers predict their critical thinking dispositions. It was concluded in this study that positive and average level of relationships between critical thinking dispositions of pre-service teachers and not only the value of sensitivity but also respect for diversity have been determined whereas there are positive and low level of relationships between their critical thinking dispositions and both the value of responsibility and reliability. Moreover, when the other variables remained constant, the results indicate that the relationship between the critical thinking dispositions of pre-service teachers and their value of sensitivity are positive and at an average level while positive and low level of relationships between their critical thinking dispositions and both their values of and respect for diversity have been determined. On the other hand, the present study shows that the values pre-service teachers explain approximately one third of their critical thinking dispositions. Besides, the relative order of importance the predictor variables have on critical thinking dispositions of

pre-service teachers are sensitivity, respect for diversity and responsibility, respectively. In addition, when the t-test results concerning the significance of coefficients for regression are investigated, it can be asserted that the values of sensitivity, reliability and respect for diversity are quite significant predictors of pre-service teachers' critical thinking dispositions.

In the literature, no study examining the values of pre-service teachers and their critical thinking dispositions have been reached. However, in the study of Alkin-Sahin et al. (2016), conducted on Science and Technology and Mathematics teachers, it was concluded that the relationships between teachers' critical thinking dispositions and being respectful to differences, individual and social responsibility, being open to cooperation and total professional values were determined to be significant, positive and at an average level. This result matches with the results of this present study, although the samples of these studies are not the same. In this sense, the values possessed by pre-service teachers have an influence on their way of thinking; and pre-service teachers' being sensitive to incidents in their environment, being respectful for diversity and having responsibilities increases their critical thinking dispositions. Hence, as the university education reminds pre-service teachers that these values are quite important and also pre-service teachers internalize these values as it provides experiences during their education, it can develop the critical thinking dispositions of pre-service teachers. Moreover, classroom practices and activities supporting critical thinking might encourage for pre-service teachers to internalize these behaviors. However, more extensive studies are required to be conducted to identify the reasons behind lower level of the critical thinking dispositions of university students.

## Notes

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