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# Examination of the Relationship between Educational Philosophy, Critical Thinking, Classroom Engagement and Academic Achievement[1]

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**Abstract**

Educational philosophy addresses systematic ideas and conceptions in the educational manner. The purpose of this study was to examine the contributions of educational philosophy, critical thinking and classroom engagement to academic achievement among pre-service teachers by utilizing structural equation modelling. A total of 444 teacher pre-service teachers who volunteered from a state university in Turkey participated in the study. Data collection tools were Educational Belief Scale, UF/EMİ Critical Thinking Disposition Instrument and Classroom Engagement Inventory. Analysis revealed that the hypothesized model explained 22% variance of academic achievement. Path coefficients indicated that some educational philosophies were significantly related to critical thinking dispositions. Innovativeness in critical thinking disposition significantly predicted all dimensions of classroom engagement. Educational implications were discussed.

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## INTRODUCTION

In the 21st century, teachers are expected to have different skills including high-level skills, problem solving, decision-making, research, and critical thinking in order to adapt to the social and technological circumstances in education settings. In order for teachers to acquire these skills, they need to inquiry, express what they think, and have a philosophical point of view towards events and phenomena in their teaching training programs. In acquisition of these skills, educational philosophy plays an important role as philosophy raises awareness of these issues by questioning oneself, life and the source of life at an intellectual level. Educational philosophy is very critical in determining people's perspectives in the educational manner. Therefore, pre-service teachers' educational philosophy is worth examining in order for them to be successful learners and teachers in the teaching profession.

Educational philosophy includes the philosophical points that what the purpose of education in schools is, what should be teaching in schools and how it should be taught and evaluated. These philosophical views that pre-service teachers have may contribute to their critical thinking and classroom engagements. Critical thinking refers to the thinking process including reasoning and problem solving whereas classroom engagement is about actively participating in learning activities in classrooms. Understanding the role of educational philosophy on critical thinking and classroom engagement may shed light on how to design teacher training programs.

### EDUCATIONAL BELIEF AND ACADEMIC ACHIEVEMENT

Philosophy, which means the love of wisdom, can be defined as a field of knowledge formed the result of systematic, in-depth and speculative thinking on the universe and the relationship of the universe with people (Gutek, 2021). Educational philosophy, which emerged the result of the interaction between philosophy and education, tries to explain the concepts, problems and principles related to education (Ergün, 2021). Educational philosophy addresses the individual philosophical views on educational matters. These questions include education is possible, education is independent from conveying an ideology or teaching, a teacher is needed in education, whether the main purpose of education is to convey information or to gain the ability to inform, and whether education should take facts or subjects (Cevizci, 2005).

Although there are different educational philosophy movements, they can be categorized under four main educational philosophies such as progressivism, perennialism, essentialism and reconstructionism. Each educational philosophy is based on different philosophy. Educational philosophies play important roles on the development of curricula. Perennialism is the most conservative, traditionalist and inflexible educational philosophy (Wiles & Bondi, 2014). Perennialism is based on the philosophies of realism and idealism. According to perennialism, education should be structured according to unchanging moral values, universal principles, and traditions (Ergün, 2021; Sönmez, 2020). In the perennialism view, the teacher is expected to be active in teaching basic values and principles (Moss & Lee, 2010). Schools are a social institution created for the development of human mental potential (Gutek, 2021). The function of education, on the other hand, is to ensure that the human mind is used in a consistent way, to reach it to absolute truths, and to adapt it to the universal truth (Başaran, 1978).

In the essentialism view, which is based on realism and idealism philosophies, it is advocated to reflect the knowledge and skills that were useful in the past to the future. Accordingly, children are born without any knowledge. It should be ensured that these children adapt to the society and become virtuous individuals by transferring the past knowledge (Sönmez, 2020; Toprakçı, 2002). In the essentialism movement, the teacher is in the position of conveying the information (Moss & Lee, 2010). At school, the knowledge accumulated in the society is transferred to the student by using traditional methods (Varış, 1998).

Progressivism is based on the philosophy of pragmatism and asserts that everything is constantly changing (Yayla, 2009). Unlike perennialism and essentialism, it does not accept universal and unchangeable truths. According to progressivism, knowledge is obtained through the interaction of the individual with his/her environment. For this reason, everything from life should be included in the education program because education is a part of life. According to progressivism, the student should take an active role on learning whereas teacher is a guide. The teacher should ensure that the classroom environment is democratic and should not punish the student in education (Sönmez, 2020).

According to reconstructionism, which is the continuation of this trend and based on pragmatism, education should aim to rebuild society in order to overcome the cultural crisis of the age (Sönmez, 2020; Yayla, 2009). In order to achieve this goal, the school should reinterpret the basic values of western civilization in the light of scientific knowledge (Sönmez, 2020; Toprakçı, 2002). Ensuring the peace and happiness of people, realizing change through practice, gaining values such as love, cooperation and balance, and employing a democratic lifestyle are among the objectives of education (Sönmez, 2020). According to this educational philosophy, human being can decide which path to choose, and this freedom of choice distinguishes him from all other beings in the universe. Everyone is the judge of his or her own right and wrong. The main function of the school is to develop individual autonomy. The main problem in education is not related to the techniques of transferring information, but to the criteria necessary to select the appropriate information (Büyükdüvenci, 2019).

In the literature, there have been studies that determine the educational philosophies of preservice teachers (Aslan, 2014; Doğanay, 2011; Duman, 2008; Kumral, 2015) and teachers (Altınkurt et al., 2012; Kanatlı & Schreglman, 2014). Additionally, there have been studies to examine the relationships between the educational philosophies and critical thinking dispositions, self-efficacy, understanding of learning and teaching, instructional technologies and internet use (Alkın-Şahin et al., 2014; Baş, 2016; Duman & Ulubey, 2008; Ilgaz et al., 2013). Although the previous studies have shed on the light on our understanding how educational philosophies are related to cognitive constructs in learning, we have not located any study that examines the relationship between educational philosophy and academic achievement. However, there may be relationship between educational philosophy and academic achievement. For example, pre-service teachers who adopt a progressive educational philosophy tend to value learning by doing and experiencing, not adopt the guidance of the teacher, and may learn better. Similarly, the same situation is true for pre-service teachers who hold reconstructionist view. However, because the philosophy of perennialism and essentialism includes a strict discipline where the student is not active and the teacher is active, those who have these philosophies may be a low achiever. To sum up, a person who questions authority is expected to have a high academic success.

**CRITICAL THINKING AND ACADEMIC ACHIEVEMENT**

In last three decades, critical thinking has been examined in educational studies (Fisher, 2001). Critical thinking, one of the types of thinking, includes cognitive processes such as reasoning, problem solving, examining an event, reflecting, and criticizing. It underscores the importance of establishing meaningful connections between concepts and events and drawing conclusions. The thinking process starts with the fact that any situation is not sufficiently enlightened, called problem, for the individual and continues to disturb him/her physically or mentally. Then, the solution of the problem turns into a goal for the individual which directs the individual's thinking (Kalaycı, 2001). According to Sternberg (1999), critical thinking is defined as mental processes, strategies and presentations that people use to solve problems. Facione (1990) explained critical thinking as a purposeful and self-controlled judgment that results in interpretation, analysis and simple evaluation. Paul and Elder (2006) defined critical thinking as a way of thinking that requires effective communication and problem-solving skills, in which a person who thinks about any subject, content or problem increases the quality of thinking by adding intellectual standards.

Individuals with critical thinking skills tend to be open-minded, open to divergent views, analytical, aware of potential problems, systematic and organized, predisposed to focus and motivation, self-confident in thinking, honest in own thought processes, and directing others in decision making (Facione, 1998). Critical thinkers are more likely to show maturity in questioning, intellectual curiosity and decisions, be aware of the complexity of the problem when the results are not certain, and show the ability to make decisions at the appropriate time (Giancarlo & Facione, 2001). According to Facione (2010), a good critical thinker should be confident, questioning, rational, truth-seeking, systematic, analytical, and open-minded in reasoning. Paul and Elder (2006) listed the characteristics of a good critical thinker as clearly formulating the current problem, gathering information and evaluating this information using abstract ideas, reaching logical and well-questioned conclusions, and communicating effectively with others in solving complex problems.

In the literature there have been studies examining the relationship between critical thinking and academic achievement. Most studies have reported a positive relationship between critical thinking and academic achievement. For example, it was determined that there was a positive relationship between students' mathematics achievement and critical thinking skills (Açıkgöz-Ayrancı, 2011; Kayagil, 2010). A positive and significant relationship was found between the critical thinking disposition of vocational school students and their mathematics course achievement scores (Aksu, 2012). It has been determined that there was a relationship between critical thinking and academic achievement of students in physics and science courses (Alpaslan, 2016; Alpaslan et al., 2016). Other studies in the literature have provided evidence that there is a positive relationship between critical thinking and academic achievement (Akar, 2007; Bers et al., 1996; Karataş, 2013; Kökdemir, 2003; Palavan & Başar, 2014; Stupnisky et al., 2008). From these studies, it can be said that students with high critical thinking dispositions or skills are expected to have high academic achievement.

**CLASSROOM ENGAGEMENT AND ACADEMIC ACHIEVEMENT**

Classroom engagement is a multi-dimensional construct that include cognition, behaviors and emotions (National Research Council, 2003). Classroom engagement has been expressed as the learning process of students by actively participating in the course (Christenson et al., 2012). In the literature, classroom engagement is generally classified in three dimensions as cognitive, emotional and behavioral (Wang et al., 2014). *Emotional engagement of the* student in the course means that they are interested in the course, enjoys it and is excited. *Cognitive engagement* is the use of processes such as strategy use, concentration and meta-cognition in classroom engagement. *Behavioral engagement* is observable behaviors such as doing homework and being active in-group work (Skinner et al., 2009).

In the literature, studies have examined the relations of classroom engagement with other educational variables. In the study conducted with pre-service teachers, it was determined that pre-service teachers' classroom engagement in the course increased their academic achievement (Kaplan, 2009). In another study with medical students, it was found that classroom engagement in applied courses in medical education increased students' academic success (Tengiz et al., 2022). Similarly, studies with middle and high school students have showed that classroom engagement positively predicted students' academic achievement in various subjects (Alpaslan & Ulubey, 2021; Bush et al., 2006; Çelik et al., 2018; Sever et al., 2014). To sum up, students with a higher emotional, behavior and cognitive engagements may have a high achievement score.

**EDUCATIONAL BELIEF, CRITICAL THINKING, CLASSROOM ENGAGEMENT AND ACADEMIC ACHIEVEMENT**

Conceptual theories and research in the literature have showed that a strong relationship between educational philosophies and critical thinking may exist because philosophy is concerned with the laws of thinking for the activity of thinking (Gündoğdu, 2009). In other words, it focuses on the norms of good thinking, the concept of human thought, and the mental skills necessary for a realistic

and impartial worldview (Şahinel, 2002). In addition, critical thinking is itself a philosophical activity. Some researchers explain the concept of critical thinking by considering it philosophically and psychologically. Gibson (1995) dealt with philosophical approach and critical thinking as the norms of good thinking, the concept of human thought and the mental skills necessary for an impartial worldview.

Critical thinking skills are very important skills for preservice teachers because teachers who think critically are expected to question the facts, truths, good and beautiful things in education, to create their own educational philosophies and to structure their classroom practices in the light of this philosophy. Alkın-Şahin et al., (2014) reported that there is a relationship between the educational philosophies of teachers/pre-service teachers and their critical thinking dispositions. Therefore, educational philosophies teachers hold may be expected to predict their critical thinking skills or dispositions. Individuals' philosophical perspectives and critical thinking can also positively contribute to their classroom engagement. Individuals with a high critical thinking skill seek opportunities to use their skills and abilities to reason, solve problems, and make judgments, so that they can engage in the class. Such an individual is a confident communicator and is able to explain the reasoning process that takes place when trying to reach a judgment or solve a problem.

Among other courses, the teaching principle and methods course are an important course for the pre-service teachers. The course is designed to foster pre-service teachers' knowledge on how to teach in classrooms. Research has showed that the course had one of influential courses in-service teachers' classroom practice (Esengül-Aygün & Şahin-Taşkın, 2020; Kuzu & Demir, 2015; Yaralı, 2017; Yeşilpinar-Uyar, 2016). Thus, it is a compulsory course in all pre-service teacher programs. For these reasons, in this study, we focused on the teaching principles and methods courses.

The purpose of this study was to explain the relationship amongst educational philosophies, critical thinking, classroom engagement and academic achievement using structural equation modeling (SEM) as it allows researchers to test the estimations in hypothesized model. First, it was hypothesized that educational philosophies adopted by the pre-service teachers predicted their critical thinking. It is because that pre-service teachers' educational philosophy could influence how they questioned problems and think critically. Educational philosophy pre-service teachers hold may influence the way they approach the knowledge and authority. Secondly, critical thinking could contribute to classroom engagement because individuals with higher critical thinking were expected to participate in the course more actively. Finally, classroom engagement predicted academic achievement because their engagement in the course would influence their way of knowledge construction since the current view on learning requires the learner's active participation.

## METHOD

In this part of the research, information about the model of the study, the participants, data collection tools, data collection and analysis were given. Data were collected with Educational Beliefs Scale, Critical Thinking Scale, and Classroom Engagement Inventory and the final grade of the course. SEM was used to determine the relationships between variables.

### RESEARCH DESIGN

In the study, a correlational research design was used because the purpose of the study was to explain the relations amongst educational philosophies, critical thinking disposition, classroom engagement and academic achievement. The correlational research design is non-experimental research methods to examine the relations between variables. This sort of design usually requires quantitative data and appropriate quantitative data analysis.

**PARTICIPANTS**

A convenience sample strategy was used to determine the participants of the study (Creswell, 2007). Fraenkel et al., (2012) state that in cases where the sample cannot be determined randomly or systematically, it can be selected from the accessible groups who are suitable for the study. The participants were pre-service teachers who enrolled in the teaching principles and methods course at the education faculty of a state university located in the West Region of Turkey. They were enrolled in various teacher programs as Turkish (n=51), mathematics (n=45), science (49), social studies (42), English (50), German (16), preschool (48), primary school (64), and counseling (79). A total of 444 teacher pre-service teachers who volunteered participated in the study. The course was the second-year compulsory course in all teacher programs. Of the participants, 300 were female and their mean age was 20.09 years old.

**DATA COLLECTION TOOLS**

In the collection of research data, Educational Beliefs Scale, UF/EMI Critical Thinking Disposition Scale and Classroom Engagement Inventory were used. In addition, as the academic achievement score, the participants' final course grade in the teaching principles and methods course was also taken.

***EDUCATION BELIEFS SCALE***

Educational Beliefs Scale, developed by Yılmaz et al., (2011), was used to map pre-service teachers' educational philosophy under four views as essentialism, perennialism, progressivism, and reconstructionism. Yılmaz et al (2011) reported inter consistency values (Cronbach alpha) of the sub-scale as .81 for reconstructionism, .91 for progressivism, .70 for perennialism and for essentialism. In the exploratory factor analysis they run, a total of 50% variances were explained by the factors. In this study, confirmatory factor analysis (CFA) was performed from the data to assess the validity. Results of the CFA showed a good fit based Hu and Bentler (1999) cutoff criteria (RMSEA lower than .06 and CFI higher than .95) as $\chi^2$ (730) = 1679.95, RMSEA= .056, CFI= .96 and SRMR= .072. In addition, Cronbach alpha values were computed for each factor to assess the internal consistency and found as .78 for reconstructionivism, .84 for progressivism, .71 for perennialism and .82 for essentialism. All were above acceptable cut-off value of .70 for reliability. These results showed that the measurement tool was valid and reliable

***UF/EMI CRITICAL THINKING DISPOSITION INSTRUMENT***

The UF/EMI Critical Thinking Disposition Instrument, which was developed by University of Florida researchers and adapted into Turkish by Ertaş-Kılıç and Şen (2014), was used to measure pre-service teachers' critical thinking disposition. As a 5-point Likert scale, the instrument consists of 25 items under three factors named as engagement, cognitive maturity and innovativeness. Ertaş-Kılıç and Şen (2014) reported the instrument had an acceptable fit with data ($\chi^2$ (296) = 813.66, RMSEA= .076, RMR= .07 based on the CFA analysis. Internal consistency values for the instrument, reported by Ertaş-Kılıç and Şen (2014), were .88 for engagement, .70 for cognitive maturity and .73 for innovativeness. In this study, the CFA results showed an acceptable fit as $\chi^2$ (272) = 873.75, RMSEA= .066, CFI= .93 and SRMR= .062. Cronbach alpha values for internal consistency were .80 for engagement, .72 for cognitive maturity and .75 for innovativeness.

***CLASSROOM ENGAGEMENT INVENTORY***

Classroom Engagement Inventory was used to measure pre-service teachers' behaviorally, affectively and cognitively classroom engagement. The inventory was developed by Wang et al., (2014) and adapted into Turkish by Sever (2014). As a five point Likert scale (1: never, 5: always), the inventory consists of five sub-factors as cognitive engagement, affective engagement, behavioral engagement-compliance, behavioral engagement-effort and disengagement. Sever (2014) reported that the

inventory had an acceptable fit with data ($\chi^2$ (225) = 432.77, RMSEA= .068, CFI= .97) based on the CFA analysis. Sever (2014) reported internal consistency values as .87 for affective engagement, .82 for behavioral engagement-compliance, .74 for behavioral engagement-effort, .89 for cognitive engagement and .69 for disengagement. In this study, CFA results showed an acceptable fit with data as $\chi^2$ (220) = 747.85, RMSEA= .069, CFI= .91. Internal consistency values were .86 for affective engagement, .70 for behavioral engagement-compliance, .72 for behavioral engagement-effort, .88 for cognitive engagement and .84 for disengagement. These results showed that the inventory was reliable and valid.

***ACADEMIC ACHIEVEMENT***

In order to determine the academic achievement of the pre-service teachers, the grade in the teaching principles and methods course were used. Preservice teachers' grades contributed of two examinations, mid-term and final examinations (each equally and ranged from 25 to 100). Using students' course grade can be problematic because of bias, validity and reliability. However, in the time of data collection, the teaching principles and methods course were taught by four different instructors who each of them was assigned at most three classes. In addition, they had a PhD degree in educational sciences. Because the instructors were experts in measuring students' academic achievement, the final course grade can be considered as valid and reliable.

**DATA COLLECTION AND ANALYSIS**

In data collection, the participants were informed about the scope and purpose of the research. Those who volunteered to participate in the study were given 30 minutes to fill out the measurement tools under supervision of their instructors. In data analysis, several statistical methods were used. First, normality and outlier cases were screen. Then, reliability and validity of data were tested. Later, SEM was used to address research questions. There are two types of SEM as measurement model and structural model. The measurement model was used for validity purposes while structural model for addressing the research questions. In the structural model, variables were considered as observed variables with error term as the total number of participants was not large enough to establish each variable as a latent variable in the model (Alpaslan et al., 2016; Kenny, 2014). As the variables were measured in continuous scale and data met the normality, the maximum estimation procedure was used to estimate the model under consideration. After the model was run, the model fit scores and modification indices were examined. Based on the modification indices, interactions between the scales were modified if the theoretical model allowed. While evaluating the model fit, there are various fit indices in the literature. We used fit values recommended by Hu and Bentler (1999) for the moderate fit as RMSEA lower than .08 and CFI higher than .90, for the good fit as RMSEA lower than .06 and CFI higher than .95.

## RESULTS

**DESCRIPTIVE STATISTICS**

The purpose of the study was to determine the relations amongst educational philosophies, critical thinking disposition, classroom engagement and academic achievement. Descriptive statistics on the variables in the study and Pearson correlation coefficients were given in Table 1.

**Table 1**. *Descriptive Statistics Including Mean and Standard Deviation and Pearson Correlation Between Variables.*

| | | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | PE | — | | | | | | | | | | | | |
| 2 | ES | .18** | — | | | | | | | | | | | |
| 3 | PR | .36** | -.25** | — | | | | | | | | | | |
| 4 | RE | .38** | .11* | .51** | — | | | | | | | | | |
| 5 | EN | .32** | .10 | .42** | .35** | — | | | | | | | | |
| 6 | İN | .30** | .03 | .41** | .33** | .72** | — | | | | | | | |
| 7 | CM | .35** | .01 | .45** | .37** | .65** | .63** | — | | | | | | |
| 8 | AE | .18** | .08 | .20** | .20** | .37** | .38** | .27** | — | | | | | |
| 9 | BEE | .25** | .09 | .26** | .26** | .33** | .37** | .27** | .70** | — | | | | |
| 10 | BEC | .24** | .01 | .32** | .27** | .41** | .43** | .35** | .59** | .60** | — | | | |
| 11 | CE | .19 ** | .06 | .27** | .27** | .54** | .53** | .44** | .52* | .54** | .57** | — | | |
| 12 | DE | .03 | -.23** | .22** | .09 | .04 | .11* | .08 | .06 | .10* | .12* | .12* | — | |
| 13 | AA | .12** | -.03 | .16** | .16* | .25** | .21** | .23** | .39** | .40** | .36** | .38** | .25** | — |
| | Mean | 3.93 | 2.60 | 4.28 | 3.93 | 3.88 | 3.89 | 3.93 | 3.37 | 3.42 | 3.68 | 3.54 | 3.45 | 71.4 |
| | SD | 0.53 | 0.89 | 0.46 | 0.58 | 0.44 | 0.44 | 0.45 | 0.75 | 0.77 | 0.70 | 0.74 | 1.00 | 10.3 |

Note: PE: Perennialism, ES: Essentialism, PR: Progressivism, RE: Reconstructionism, EN: Engagement, IN: Innovativeness, CM: Cognitive Maturity, AE: Affective Engagement, BEE: Behavioral Engagement-Effort, BEC: Behavioral Engagement-Compliance, CE: Cognitive Engagement, DE: Disengagement, and AA: Academic Achievement,

*p < .05, **p < .01

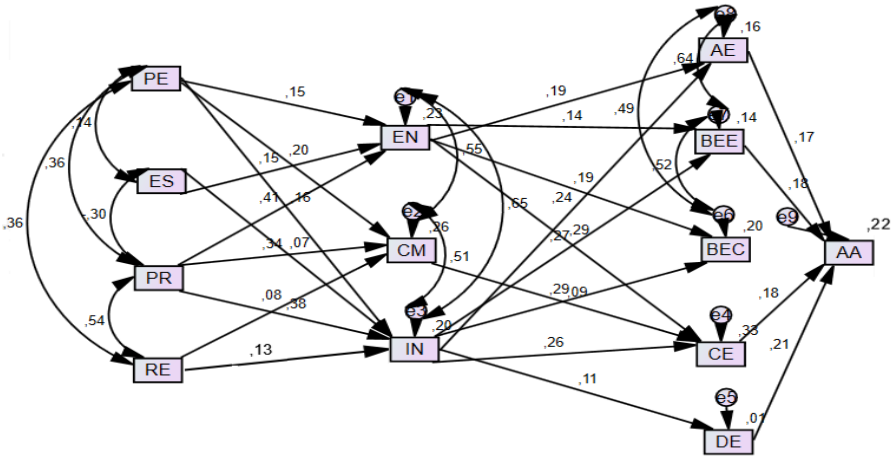
As seen in Table 1, mean values of educational philosophy varied from 2.60 to 4.28. A higher score showed that the participants tend to have the corresponding educational philosophy whereas a lower score indicate that they less tent to have that philosophy (Yılmaz et al., 2011). The highest mean value was in progressivism that the participants can be classified as strong believers in the five Likert scale (1.00-2.33: weak, 2.34-3.66: moderate, 3.67-5.00: strong). In addition, participants were strong believers of perennialism and reconstructionism. However, they were the moderate believers of essentialism. As for critical thinking, mean values showed that the participants were in moderate thinking level. The highest mean value was on cognitive maturity while the lowest one was on the engagement. For the classroom engagement, the participants moderately participated in the classroom activities in all sub-dimensions. The highest mean value was on the behavioral engagement-compliance whereas the lowest one affective engagement.

Pearson coefficients showed the relation of variables with academic achievement varied from small to moderate effect size (.10-.30: small, 0.31-0.50: moderate, .51-1.00 large). In addition, it was seen that not all relations were statistically significant. The relations of variables with academic achievement, all was statistically significant except essentialism. The strongest relation of academic achievement was with behavioral engagement-effort (r=. 40) whereas the smallest was with having a perennialism philosophy (r= .12). Among educational philosophies, all were statistically significant; however, the sign of the relation was negative between perennialism and progressivism. For critical thinking, all correlations were positively statistically significant. Again, sub-dimensions of classroom engagements, relations were statistically significant and positive except affective engagement and disengagement that was non-significant.

**STRUCTURAL EQUATION MODELING**

SEM in AMOS was used to test the hypothesized model. In SEM, variables were taken as observed variables. After the model run, modification indices were examined to obtain better model fit. Based on model fit, correlations were added if the relation was theoretically plausible. The first run of SEM resulted in a poor model fit ($\chi^2$ (46) = 536.45, RMSEA= .12, CFI= .81). After modification indexes were examined, we added correlation amongst educational philosophies and critical thinking sub-dimensions. The correlations were theoretically reasonable because, for instance, progressivism and reconstructionism were based on modern philosophies. In addition, we removed non-significant paths from the model for simplicity. After the model was rerun, the fit indices were at acceptable level ($\chi^2$ (41) = 107.59, p<.01, RMSEA= .062, CFI= .97). The final version of the model was depicted in Figure 1.

**Figure 1**. *The Graphical Results of SEM Analysis*




The hypothesized model successfully explained 22% variance of pre-service teachers' achievement in the teaching principles and methods course. This result indicated that a good

proportion of variance in academic achievement could be accounted for only by educational philosophy, critical thinking, and classroom engagement. Moreover, the model explained variances on other variables including 16% affective emotion, 14% in behavior engagement-effort, 20% in behavior engagement compliance, 33% in cognitive engagement, 23% in engagement, 26% cognitive maturity and 21% innovativeness.

All path unstandardized and standardized coefficients were displayed in Table 2. Path coefficients indicated that some educational philosophies were significantly related to critical thinking dispositions. The largest coefficient was between progressivism and engagement, indicating that having a progressivism predicted positively engagement disposition. In addition, the other path coefficients of progressivism were moderately related to critical thinking dispositions. Essentialism view was only related to the engagement (β= .15, p < .05). Perennialism views contributed positively to all dimensions of critical thinking dispositions.

**Table 2.** *Path Coefficient in the Model*

| *Variable* | *Direction* | *Variable* | *Estimate* | *β* | *p* |
|---|---|---|---|---|---|
| EN | <--- | PE | .13 | .15 | .01 |
| CM | <--- | PE | .18 | .20 | *** |
| IN | <--- | PE | .13 | .16 | .01 |
| EN | <--- | ES | .08 | .15 | *** |
| IN | <--- | ES | .04 | - | .13 |
| CM | <--- | ES | .02 | - | .40 |
| EN | <--- | PR | .38 | .41 | *** |
| CM | <--- | PR | .33 | .34 | *** |
| IN | <--- | PR | .35 | .38 | *** |
| CM | <--- | RE | .07 | .08 | .10 |
| IN | <--- | RE | .12 | .13 | .04 |
| EN | <--- | RE | .10 | .11 | .04 |
| AE | <--- | EN | .33 | .19 | .01 |
| BEE | <--- | EN | .25 | .14 | .02 |
| BEC | <--- | EN | .31 | .19 | .02 |
| CE | <--- | EN | .50 | .29 | *** |
| DE | <--- | EN | .08 | - | .21 |
| CE | <--- | CM | .15 | .09 | .03 |
| DE | <--- | CM | .10 | - | .49 |
| BEC | <--- | CM | .11 | - | .24 |
| BEE | <--- | CM | .04 | - | .70 |
| AE | <--- | CM | -.02 | - | .87 |
| AE | <--- | IN | .42 | .24 | *** |
| BEE | <--- | IN | .47 | .27 | *** |
| BEC | <--- | IN | .47 | .29 | *** |
| CE | <--- | IN | .43 | .26 | *** |
| DE | <--- | IN | .25 | .11 | .04 |
| AA | <--- | AE | .10 | .17 | .02 |
| AA | <--- | BEE | .12 | .18 | .01 |
| AA | <--- | CE | .12 | .18 | *** |
| AA | <--- | DE | .10 | .21 | *** |
| AA | <--- | BEC | .04 | - | .29 |

Path coefficients indicated that some critical thinking dispositions were related to classroom engagements. The largest path coefficients were the contribution of engagement to cognitive engagement and of innovativeness to behavior engagement-compliance (β= .29, p < .05 for both). Innovativeness significantly predicted all dimensions of classroom engagement whereas cognitive maturity was only related to cognitive engagement. All dimensions of classroom engagement were positively related to academic achievement except behavior engagement-compliance. Interestingly, disengagement had the largest contribution to academic achievement.

## DISCUSSION, CONCLUSION, AND IMPLICATIONS

This study aimed at explaining the relationship between educational philosophies, critical thinking, classroom engagement and academic achievement. A SEM approach was used to address the research purposes. Results of the SEM indicated that the hypothesized model fit the collected data well.

Descriptive results showed that the dominant educational philosophies among pre-service teachers were progressivism, reconstructionism and perennialism whereas essentialism were not. This result was consistent with the previous studies showing that pre-service teachers and teachers mainly adopt progressivism, reconstructionism and perennialism and less essentialism (Ağdacı, 2018; Alkın-Şahin et al., 2014; Baş, 2015; Berkant & Özarslan, 2019; Coşkunoğlu & Ünal, 2022; Eğmir et al., 2021; Gökbulut, 2020; Benevolent & Oğuz, 2017; Ilgaz et al., 2013; Kahramanoğlu & Özbakış, 2018; Kozikoğlu & Erden, 2018; Sönmez-Ektem, 2019; Yeler, 2022). Since the primary school curricula are mainly based on the philosophy of progressivism (Ulubey & Aykaç, 2017), it can be said that it is important for the prospective teachers to position themselves in progressivism and reconstructionism in terms of the effectiveness of their future teaching. However, it was found that the pre-service teachers adopted perennialism, emphasizing a traditional educational philosophy. According to Ergün (2021), in the perennialism philosophy, education should be based on unchanging universal principles and moral values (Gutek, 2021). On the other hand, it was found that pre-service teachers were not favor of essentialism. Sönmez (2020) stated that in essentialism it was aimed to adapt to the society by transferring information to children in the past. Moreover, the social knowledge should be transferred to students by using traditional methods at school (Varış, 1998). From these results, it can be said that pre-service teachers are less likely to believe in a teaching process that is limited to the teaching of past knowledge. For this reason, they intensively adopt contemporary educational philosophies such as progressivism and reconstructionism. This situation may enable students to learn by doing, where they are active and structure the process themselves, and to educate individuals who are suitable for the professions of the future. Results showed that pre-service teachers may be aware of the crises in which societies are because they are in reconstructionism. İn addition, pre-service teachers can ensure that individuals who adhere to universal values and principles are raised by adopting the philosophy of perennialism. Consistent with the previous studies (e.g., Tunca, et al., 2014), the reason for the adoption of the philosophy of perennialism may be the way of that the instructors in higher education are dominantly based on memorization.

Results showed that the participants' critical thinking disposition in cognitive maturity, engagement and innovativeness were at high level in the five-point scale. These results were consistent with the previous studies (Bakır, 2022; Çağlı, 2022; Duncan et al., 2016; Erişti & Erdem, 2018; Orhan, 2022; Ulu & Baş, 2020). Considering that most of the pre-service teachers had a high cognitive maturity, it can be said that they can easily solve the problems they experience with stakeholders such as students, colleagues, school administrators and parents in different ways because they are aware of themselves and their environment. According to Ertaş-Kılıç and Şen (2014), individuals with a high level of cognitive maturity are aware of their prejudices and tendencies when making decisions. They are aware that their thoughts are influenced by their experiences. These people are more likely to be open to different opinions, considering that others may not agree with his ideas. İndividuals with high cognitive maturity are aware that many problems are complex. People with a high level of innovation are constantly in search of new knowledge. They tend to be innovative in their lives, in their world, most importantly in their profession. They learn new information by researching, reading and questioning. İndividuals with high engagement know that reasoning is necessary if they are good. They can use the reasoning process to solve problems and make judgments (Irani et al., 2007). In addition, it can be expected that preservice teachers with a high level of innovation are more likely to follow professional innovations and use new approaches, strategies, methods, and techniques. It can be

expected that pre-service teachers with high engagement are more likely to be able to reason about solving the problems they encounter and making judgments.

Results showed that preservice teachers' scores from the Classroom Engagement Inventory were moderate. The previous studies reported similar results regarding classroom engagement. For example, Çelik et al., (2017) found that the cognitive, affective, and behavioral engagements of high school students were moderate. Again, in the study of Sever et al., (2014) with high school students was found that their engagement in the course was at an average level. Considering the results of the research conducted at different teaching levels and subject area, the reason for moderate level of engagement could be that the students may not be willing to show enough interest in the course, get excited in, and are not satisfied in the classroom because they are less likely to have fun in the classroom. Because of traditional teaching methods, students are more likely to not participate in the activities mentally and not fulfill the requirements at a high-level thinking. For this reason, it is understood that the students cannot fully participate in the lesson. In addition, traditional instructional strategies are less like to allow students to engage in the class.

Results of path analysis showed that the hypothesized model were successful at explaining the relationship between the educational philosophies adopted by pre-service teachers and critical thinking, classroom engagement and academic achievement. For the relation between educational philosophies, the strongest relationship was between progressivism and reconstructionism, as expected. These two philosophies require students be active and learn by doing, and the teacher is the guide. Aybek and Aslan (2017) combined progressivism and reconstructionism under the name of contemporary education philosophy. Studies in the literature showed that there was a relationship between progressivism and reconstructionism (Biçer et al., 2013, Gökbulut, 2020; Gökbulut, 2019; Tunca et al., 2015). Perennialism and essentialism are positioned against the contemporary educational philosophy. As expected, a negative relationship was found between essentialism and progressivism. In the literature some studies have provided evidence that a negative relationship between progressivism and essentialism existed (Alkın-Şahin et al., 2014; Aypay, 2011; Biçer et al., 2013; Gökbulut, 2019; Gökbulut, 2020). While it is about the development of mental abilities in essentialism, it is about the solution of problems that may be encountered in life in progressivism (Gutek, 2021). Since essentialism is an educational philosophy based on the transfer of old knowledge to new generations and the socialization of the individual, it is plausible to expect a negative relationship with progressivism. On the other hand, it is quite interesting that a positive relationship between perennialism and progressivism was found. However, there are studies in the literature showing that there is a positive relationship between progressivism and perennialism (Biçer et al., 2013; Gökbulut, 2019; Gökbulut, 2020). Tuncel (2017) shows the reason for the relationship between the two philosophies as the use of a fixed program in the philosophy of perennialism and the teaching of unchanging and universal principles in the curriculum. The fact that teacher education programs are fixed and teaching unchanging principles may be the reason why teacher candidates adopt perennialism.

Analysis revealed that there was a relationship between the educational philosophies adopted by the preservice teachers and their critical thinking. A significant relationship was found between the philosophy of progressivism and the engagement, innovation and cognitive maturity sub-dimensions of the critical thinking disposition scale. A significant relationship was found between the philosophy of perennialism and cognitive maturity, and between the philosophy of essentialism and engagement. On the other hand, no significant relationship was found between essentialism and engagement and innovation. Alkın-Şahin et al. (2014) reported that there was a positive significant relationship between the educational philosophies of progressivism, reconstructionism and perennialism adopted by the pre-service teachers and their critical thinking disposition, and a negative significant relationship between essentialism and critical thinking disposition. It can be said that the positive relationship

between the philosophy of progressivism and the sub-dimensions of critical thinking dispositions, and the negative relationship between the philosophy of essentialism is an expected result. On the other hand, a positive relationship between the philosophy of perennialism and the sub-dimensions of critical thinking disposition was against to our hypothesis. Perennialism, which emphasizes the unchanging universal moral values and the importance of principles in education, explains everything according to immutability. The reason for this result may be that people take thinking ability as a basis, consider thinking based on reason and logic in education, and adopt deduction, questioning and discussion as a method (Ergün, 2021; Gutek, 2021; Sönmez, 2020). Other studies in the literature (Ağdacı, 2018; Gündoğdu, 2009; Hayırsever & Oğuz, 2017; Kale, 2009) show that there is a relationship between the two variables. When the research results are evaluated in general, it can be said that there is a relationship between educational philosophy and critical thinking dispositions.

Results showed that a significant relationship was found between innovativeness and behavioral engagement, cognitive engagement and affective engagement. Since individuals with the innovative critical thinking are willing to search of new information, they will learn new information by researching, reading and questioning. For this reason, it can be expected that their behavioral, cognitive and most importantly affective engagement in the course are more likely to be high. In addition, a significant relationship was found between the engagement dimension of critical thinking and the cognitive engagement dimension of classroom engagement. In engagement and cognitive engagement, the functioning of cognitive processes in the learning is in inquiry. Therefore, a relationship between the two variables can be expected. In other words, it can be said that engagement affects cognitive engagement. We have not located any study examining the relationship between the sub-dimensions of critical thinking disposition and classroom engagement. However, there were studies showing a relationship between critical thinking and classroom engagement (Butcher et al., 2017; Caratozzolo et al., 2019; DeWaelsche, 2015; Jones, 2014; Shcheglova et al., 2019; Williams & Lahman, 2011; Zhang & Zhang, 2013). Considering these results, it can be said that there is a relationship between critical thinking and classroom engagement and that critical thinking can affect classroom engagement.

Classroom engagement has been a popular subject in educational research in recent years (McMahon & Portelli, 2004). Studies emphasized that cognitive, emotional and behavioral engagement in the classroom is important for student success (Jordan et al., 2014). In this study, a positive and significant relationship was found between pre-service teachers' cognitive engagement and disengagement in the course and their academic achievement scores. This result shows that pre-service teachers questioned what they did. Consistently, Yılmaz (2017) found a positive and significant relationship between cognitive engagement in the classroom and academic achievement. On the other hand, it is quite interesting that there was a positive relationship between disengagement and academic achievement. The reason for positive relation may be because of that the final course grade consisted of two exams which dominantly contained knowledge level questions. In studies in the literature, a negative relationship was found between disengagement and academic achievement (Çelik et al., 2018). In different studies conducted with preservice teachers, it has been determined that their engagement in the classroom increases their achievement (Kaplan, 2009; Tunga & İnceoğlu, 2020). These results show that classroom engagement is important in explaining academic achievement.

This study has provided evidence that the educational philosophy, critical thinking dispositions and classroom engagement significantly explain the academic achievement of the pre-service teachers. Philosophy, seen as a thinking activity, focuses on the mental skills required for a well-thinking, realistic, impartial worldview. Critical thinking, which is a way of thinking, is also a philosophical activity (Gündoğdu, 2009; Şahinel, 2002). It seems that an individual's philosophical views in education forms the critical thinking process (Alkın-Şahin et al., 2014). Educational philosophy

and critical thinking are also important in teacher education. Because teachers who think critically are expected to question the facts, truths, and good things in education, to create their own educational philosophies and to structure their classroom practices in the light of this philosophy. Teachers with educational philosophies are expected to have critical thinking skills or dispositions. Individuals' philosophical perspectives and critical thinking can also positively affect their engagement in the course. According to Mathews (2003), responsibilities should be shared by students and teachers in a classroom environment that supports critical thinking. The teacher should encourage students to take initiative, use cooperative learning methods, and actively participate in the process of determining the rules of behavior in the classroom (Crawford et al., 2009). Based on the results of the research, it can be said that the relationships between the philosophy of education, critical thinking and engagement in the course explain the academic success of teacher candidates.

Based on the relationship between educational philosophy, critical thinking disposition, classroom engagement and academic achievement, the following suggestions have been made:

• It has been observed that the educational philosophy adopted by the pre-service teachers, their critical thinking dispositions and their engagement in the course significantly explained academic achievement. For this reason, teacher education undergraduate programs should be arranged in a way that will enable pre-service teachers to adopt contemporary educational philosophies, develop critical thinking skills and increase their engagement in the course.

• This study explains the effects of educational philosophy, critical thinking and classroom engagement on academic achievement. With other important variables including self-efficacy, motivation and attitude, the explained variance of academic achievement can be increased.

• In the study, a positive relationship was found between not attending the course and academic success. Qualitative studies can be conducted to examine the reason for this.

**LIMITATIONS**

This study has some limitations. First, in the study, we used the course grade as achievement score. Using achievement score could be problematic because of validity and reliability issue. For this reason, there is a need for a validated and reliable test to measure pre-service teachers' knowledge on teaching principle and methods. Lastly, students' critical thinking and classroom engagement can be discipline-specific. Generalization of the results of this study should be approach with this caution.

**AUTHOR CONTRIBUTION**

- First author have made substantial contributions to conception and design, or acquisition of data and writing

- The second author have been involved on data analysis, interpretation of data and writing

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