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An Experimental Study on Development Critical Thinking Skills via Educational Drama as a Teaching Method

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ABSTRACT

The purpose of this study is to investigate the effects of a Drama Based Critical Thinking Skills Training Program on 2nd grade bachelor degree students' (who are attending to a preschool teacher training program) critical thinking skills. This is a quasi-experimental study. Totally 50 students areequally divided into two different groups as they are experimental group and control group. Experimental group has attended to 10 sessions of a course as drama based training program. It has been prepared to promote students' critical thinking skills. California Critical Thinking Disposition Inventory (CCTDI) has been offered as pre-test and post-test to both groups in order to obtain the data. It has been found that there issignificance on behalf of experimental groupby the end of this study. It also has been found that the continuity of training program (p> ,05).

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Keywords:
Critical thinking, educational drama, training program, student

Introduction

Transfer of the knowledge gained at school to real life is one of the most important problems of education. One of the reasons of this problem is that school and society have different conditions of learning and living. It is possible to transfer the events in society to learning environments via educational drama (Önder, 2001). Educational drama is known as it is drama in educational processes. We cannot define educational drama unless we do not have any idea about creative works and activities. Drama in education has been defined as it is role playing creatively in order to understand and determine the social situations more (Heathcote, 1991).

Educational drama activities in preschool years help us to develop imagination, self-confidence skills, self-control skills and to share experiences (Rooyackers, 2009). Educators have the most important role to help students to acquire these skills. Educator is the person who has to guide while students are animating, imagining and reflecting the cases they are offered as example (Freeman, 2010). Educator who will study with the children should enough experiences on his/her own field. And also he/she should have sufficient knowledge on children's interests, needs and expectations. Educators should have sufficient knowledge on games, communication skills, how to plan and organize, observing and technical knowledge about educational drama. One of the most important skills of a preschool teacher is to promote creativity.

It is necessary to promote educators' thinking skills in order to run the educational processes well. Critical thinking (which is one of these important thinking skills) is an important skill to promote creativity. According to Norris (1985), having critical thinking skills, is one of the requirements of being a well-educated person. And critical thinking is an ideal related to education. Again according to Norris (1985),

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critical thinking is an essential component of education and it should be always used. As another aspect, critical thinking is an active and systematic cognitive process that requires applying the things what we learned, in order to understand ourselves and the events which occur in our environment. And it also requires being aware of the others' and our cognitive processes (Cüceloğlu, 1998). This is not an innate skill. It starts with self-confidence than continues throughout different periods of our lives. School environment is first for a child after his/her home. Therefore educators have many responsibilities. One will find solutions to his/her problems easily if he/she could adapt critical thinking into his/her life. So, educational system should be compatible with critical thinking styles. And also educators should have critical thinking skills and transfer them to their students (Çıkrıkçı, 1996).

Students gaining self-determination skills as adults, taking a place in society to solve social problems as they are wise, acting as a critical observer, supporting the democracy and birthrights, easily advancing in economy and business may be possible if we ground the educational system on critical thinking skills (Feurstein, 1999). There are many studies related to critical thinking skills as including students into experimental processes. Uysal (1998)has offered a course named Turkish Culture and Civilization to bachelor degree students via discussion method, in order to determine the effects of it, on promoting students' critical thinking skills. The results of this study show that, using discussion method actively has marvelous effects on students' having critical perspectives on different events and facts. Leshowitzs, Jenkens, Iteaton and Bought (1993) have an experimental study on critical thinking. They have offered a program intended to students (who have learning disabilities) to gain complex thinking skills. As a result of this study, students had better, after implementations. Astleitner (2002) has had an experimental study on students who are attending to any of a program related to social sciences at University. Hermann investigated that if instructions via computer aided simulations or lecture is more effective. As a result of this study, the group of students who are offered computer aided simulations had better scores on critical thinking.

If we look at these studies on different areas or techniques, we can see that it is possible to promote critical thinking skills via different techniques. But, there is no study on if drama has an effect on promoting critical thinking skills. Learning environments should be designed as they can promote critical thinking skills. Educators have most important role to ensure that. Educators who indigenize the inquiry and critical thinking, should be trained in order to ensure the students to have these skills. Learning apart from rote, independent and flexible, gives opportunities to students to express themselves, ideas were argued and apart from authority and fear ensures inquiring people. Educators should be trained as they can create environments as similar as mentioned above whether in-service or pre-service (Schreglman, 2011).Educators may use such techniques; case method, question and answer, project, group discussion, experiment, observation, field trip, brain storming and different forms of drama in order to promote students' holistic development and multilateral thinking skills. Firstly educators should have these skills and know how to use these techniques in order to use them effectively. There is a lack of study on this field. In this study we tried to promote preschool teacher candidates' (who are moving towards becoming a well-educated educators) critical thinking skills via different methods and techniques of educational drama.

Method

This is a quasi-experimental study. Pre-test, post-test and follow-up tests were performed. There were two different groups as they are control group and experimental group. These techniques ensure a high level of statistical power, in order to test the effects of implementations on dependent variables. Quasi-experimental design with pre-test, post-test and follow-up test is one of the most preferred techniques in behavioral sciences. There is symbolic representation of this model on Table 1 which is used in this study at the same time (Büyüköztürk, 2009; Karasar, 2009).

Tablo 1. Model with pre-test and post-test

Pre-test			Post-test	
EG	R	I1	X	I3
CG	R	I2		I4

EG: Experimental Group, CG: Control Group, R: Neutrality between groups; X: The level of independent variable (Micro education); I1, I2: Pre-test implementations, I3, I4: Post-test implementations.

In this model, pre-test and post-test results are used to decide how independent variables' level of effectiveness (X) is (Karasar, 2009).

"Critical thinking skills" was dependent and "Educational Drama Based Critical Thinking Skills Training Program (CTSTP)" was independent variables of this study.

The Sample of This Study

The sample of this study is 2nd grade bachelor degree students (preschool teacher candidates) who are attending to a faculty of education, department of preschool education at one of the universities in the Black Sea Region of Turkey.

Students from all grades mean, 1,2,3 and 4 were offered CCTDI 4 months before deciding the sample. As the results of these implementations the scores of grades mean 1, 2, 3, and 4 were found as; n=40/x=171,71 for grade 1, n=50/x=196,82 for grade 2, n=56/x=211,66 for grade 3 and n=40/x=215,92 for grade 4. According to these results grade 2 was decided as it is the sample of this study. 50 students from grade 2 were equally grouped into two different groups as they are control group and experimental group. All participants were girls because of the conditions of department. It was considered that all the participants had similar attributes. Table 2 shows these similarities. Experimental group was offered a Drama Based Critical Thinking Skills Training Program for 10 sessions. Each session had 2 activities. Totally 20 activities were implemented. Students from control group haven't attended to any special training program. They just followed their own casual program which is offered by department. It was an important point that no students from both groups haven't attended to any drama course, before.

Data Collection Tool

CCTDI was performed to determine the teacher candidates' critical thinking skills. It was developed by Facione and Giancarlo (1992) and adapted into Turkish by Kökdemir (2003). Original version of test has 7 different subtests but Turkish version has 6. It consists 6 different subtests as they are; Truth-seeking (TS) (7 items), Open-mindedness (OM) (12 items), Analyticity (AN) (11 items), Systematicity(SY) (6 items) Confidence in reasoning (CIR) (7 items) and Inquisitiveness (IN) (8 items). Kökdemir (2003) performed a reliability analysis for CCTDI. Based on the analysis, Cronbach Alpha (α) value was calculated as for Truth-seeking (TS) α=.61, for Open-mindedness (OM) α=.75, for ,α=.75for Analyticity (AN), for Systematicity (SY) α=.63, for Confidence in reasoning (CIR) α=.77 and for Inquisitiveness (IN) α=.78.This is a likert scale. It has 6 choices as they are; "Totally Disagree" for choice 1, "Disagree" for choice 2, "Partially Disagree" for choice 3, "Partially Agree" for choice 4, "Agree" for choice 5 and finally "Totally Agree" for choice 6. Choices are equal for 1 to 6 points from choice 1 to 6. Minimum and maximum values of subtests are 10 and 60. Minimum total and maximum total values of Turkish version of test are 60 and 360. Less than 40 points for a subtest means low tendency of critical thinking and more than 50 points mean high. Less than totally 240 points mean low tendency of critical thinking and more than totally 300 points mean high.

We can define the reliability of a test as consistency of the answers given by participants. We can explain two main criterion of reliability as they are consistency of the results obtained at different time lines and consistency of the results obtained at the same time lines. Cronbach's alpha is one technique for determining the level of reliability. It can be determined if only using the item total score correlation (Büyüköztürk, 2009). CCTDI is a reliable test according to the results of Kökdemir's (2003) adaptation study. Cronbach's alpha was found as 0,88 for body of test. And it is between 0,61 and 0,78 for subtests. It is expected coefficients' to be closer to 1to be able to obtain reliability (Büyüköztürk, 2009). We can say that the test has an acceptable level of reliability.

Developing the Educational Drama Based Critical Thinking Skills Training Program (CTSTP)

CTSTP is based on critical thinking strategies and implementations of these strategies revealed by Paul, Binker, Jensen and Kreklau (1990). They divided these skills as they areeffective strategies and cognitive strategies. Affective strategies target to promote especially independent thinking skills while cognitive strategies targeting to promote macro skills and micro skills. Macro skills mean organizing the different

essential skills which require to think and micro skills mean the skills which require to consider the whole structure (Yıldırım & Yalçın, 2008).

Table 2. Critical Thinking strategies revealed by Paul and colleagues

Critical Thinking Strategies	
Affective Strategies (AS)	1. Independent thinking 2.Developing egocentric or society centric insights 3.Fair or neutral thinking 4. Understanding the relationships between emotions and thought 5.Not being biased or delaying the judgment 6.Developing courage of inquiry 7.Being gracious or thinking honestly 8. Developing tenacity of cognition 9. Confidence in thinking skills
Cognitive Strategies – Macro Skills (CSMAS)	10.Being aware of valid and invalid generalizations 11.Transfering the learned things 12.Developing own ideas 13. Clearing the various problems, results or beliefs 14.Analyzing and clearing various concepts 15.Developing a criterion for evaluations 16.Inquiring the validity of sources 17.Examining the problems in depth 18.Analyzing and evaluating the ideas 19.Finding solutions and evaluating 20.Analyzing and evaluating the actions and policies 21.Critical reading 22.Critical listening 23.Making inter disciplinary connections 24.Asking questions 25.Comparing different ideas 26.Dialectic thinking
Cognitive Strategies-Micro Skills (CSMIS)	27.Distinguishing the ideal and real things 28.Using critical vocabularies 29.Detecting the important differences and similarities 30.Examining and evaluating the hypothesis 31.Distinguising the relevant and irrelevant facts of a problem 32.Commenting fluently 33.Explaining and evaluating the proofs or datum 34.Detecting inconsistencies or dilemmas 35.Exploring the results

Paul and colleagues' (1990) implementations show how to use 35 different critical thinking strategies in classroom as stated on Table 2. Independent thinking, developing courage of inquiry, being gracious or thinking honestly, confidence in thinking skills for affective strategies; developing own ideas, clearing the different results or beliefs, examining the problem in depth, finding solutions and evaluating, asking questions and comparing the different ideas for macro skills of cognitive strategies; and finally examining and evaluating the hypothesis, distinguishing the relevant and irrelevant facts of a problem, commenting fluently and exploring the results for micro skills of cognitive strategies, had been taken into account. And all these strategies were combined with different techniques of educational drama such as; improvisation, role-changing, animation, imagination, split screen, inner voice, conscience alley.

Training program was prepared by combining educational drama techniques and critical thinking strategies. The purpose of the training program is to promote the students' critical thinking skills via educational drama techniques. Theoretical perspectives of educational drama and critical thinking were examined in order to determine the features of the program.

- All grades were offered CCTDI ant it was found that students from grade 3 and 4 have better than 1 and 2. Thus, the lack of critical thinking skills was determined. Students from grade 2 who haven't attended to any of a drama course were selected as sample.
- Educational drama techniques which will be used in program and materials were determined.
- Model of CTSTP was created as we can see on the figure 1.

- Educational drama activities which are prepared to support preschool term children's different developmental areas and critical thinking strategies were combined in order to create sessions of program. Especially it was aimed that promoting critical thinking skills such as, analyzing in depth, exploring, inquiring, detecting and solving problems, practicing the thought.

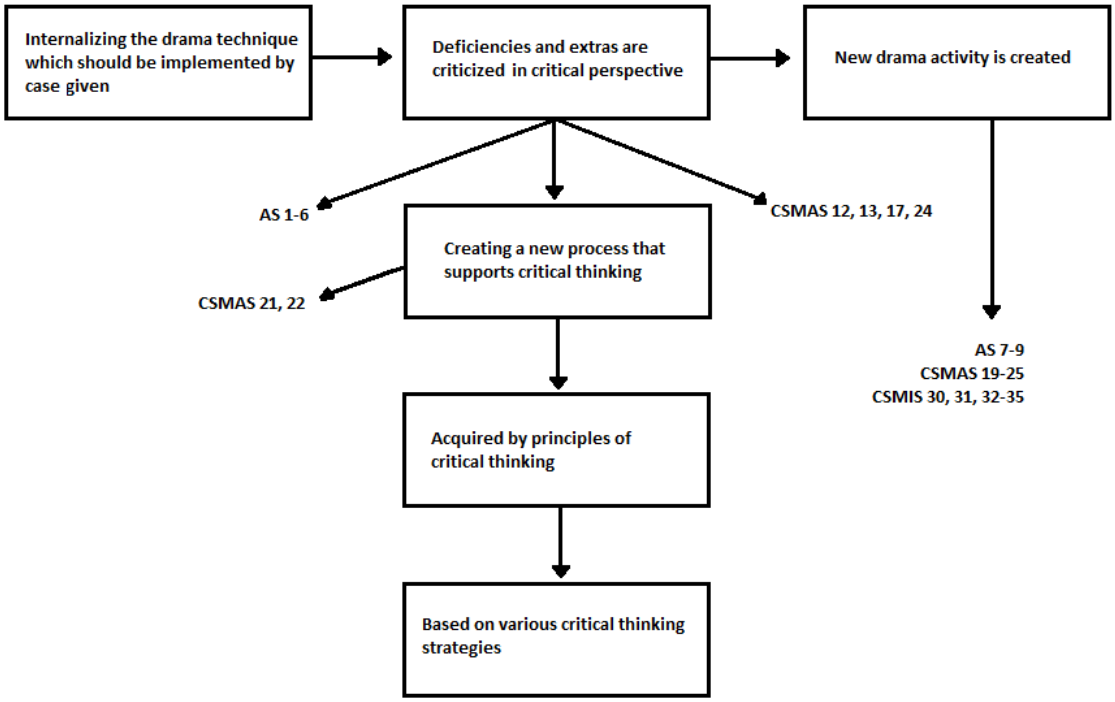


Figure 1. Model of educational drama based critical thinking skills training program

Arrangements required were made in order to get program ready to implement after experts' view. An example of activities of the program was given on Figure 2 below;

Title of activity: Dental care Targeted Area: Self-care	Participants: Small group activity Materials: Any of a material which participants assigned meanings symbolically. Targeted Critical Thinking Strategies: AS 1,6 / CSMAS 12,19 / CSMIS 31

- Educator tells to the students that they will animate an event that lived before related to brushing teeth and mouth care via improvisation. He/she groups children into five different groups. Educator narrates the same event to all the groups. "There was child who had toothache and was afraid of seeing the dentist. He/she complains because of the ache, every day. And it affects his/her learning processes negatively". Educator wants every group to think about how they will improvise the event.

Educator ensures every group member to internalize it and asks them to discuss about. Educator ensures students to criticize the exaggeration or missing and reflections should - shouldn't be. Educator wants the student to feel the problematic situation, seek for solution and to discuss about how to hinder this kind of problem before they occur.

The purpose of this process is that, students' independent thinking and promoting their inquiry skills. Educator ensures students to consider the solutions, what should be and different ideas. After all these processes educator wants students to create dramatic activities than implementations.

Figure 2. An example of activities of the program

Implementation Process

All the implementations were implemented considering willingness. Experimental group was informed about the structure, content and activities of training program. CCTDI was offered to the students of control and experimental groups as it is pre-test. Training program started one week after pre-test. It lasted for 10

sessions, 2 activities for each session. After 10 sessions both groups were offered CCTDI again, as it is post-test. And only experimental group was offered CCTDI again, four weeks after post-test, as it is follow-up test.

Analyzing the Data

The test of normality was performed. Coefficient of skewness and distortion were found between the values of -1 and +1. So, it has a normal distribution. Analysis of covariance (ANCOVA) was performed in order to compare pre-test and post-test results. ANCOVA ensures us to examine the correlation between the factors which are being tested if they have any effect on dependent variables (Büyüköztürk, 2009).T-test was performed in order to compare the post-test and follow-up test results. Related samples t-test is a statistical test which ensures us if the difference of two mean is significant (Büyüköztürk, 2009).

Findings

We questioned that if there is significance between the means of control and experimental groups according to CCTDI results before implementing CTSTP. Independent samples t-test was performed in order to compare two groups' pre-test and post-test scores. Independent samples t-test is used to understand if the difference between means of two different samples is significant (Büyüköztürk, 2009).T-test results of CCTDI scores for control and experimental groups are shown on Table 3.

As we can see on the Table 3, there is no significance between CCTDI scores of two groups, so subtests of it. We can say that two groups had the similar features before the program. We can understand why the scores of these two groups are close to each other. Experimental studies require close results between control and experimental groups at the beginning of the implementations (Kaplan, 1988). This is so important to be able to get clear results of implementations.

Table 3. T-testresults of CCTDI scoresfor control and experimental groups

Sub-test	Group	N	X	SS	Sd	t	p
TS	Experimetal	25	24,08	4,46	48	,186	,752
	Control	25	23,84	4,66			
OM	Experimetal	25	33,28	11,08	48	-,026	,973
	Control	25	33,36	11,03			
AN	Experimetal	25	49,44	5,88	48	-,167	,979
	Control	25	49,72	5,95			
SY	Experimetal	25	19,96	3,66	48	-,192	,932
	Control	25	20,16	3,70			
CIR	Experimetal	25	23,68	4,42	48	-,159	,992
	Control	25	23,88	4,46			
IN	Experimetal	25	29,24	5,44	48	-,078	,987
	Control	25	29,36	5,46			
Total	Experimetal	25	179,68	15,73	48	-,036	,970
	Control	25	179,84	15,87			

p>,05

ANCOVA results which show if training program has an effect on students' critical thinking skills are shown in the Table 4 below.

As we can see on the Table 4, as results of corrected scores, there is significance on behalf of experimental group [F=73470,730; *p<,05*; η2=,874]. According to sub-test scores, there is significance on behalf of experimental group for each. For truth-seeking [F=186,894; *p<,05*; η2=,799], for open-mindedness [F=59,519; *p<,05*; η2=,559], for analyticity [F=7,235; *p<,05*; η2=,133], for systematicity [F=46,719; *p<,05*; η2=,499], for confidence in reasoning [F=11,577; *p<,05*; η2=,198] and for inquisitiveness [F=166,277; *p<,05*; η2=,148]. According to these results, difference between the mean of two groups is significant on behalf of experimental group.

Table 4. ANCOVA results of experimental and control groups' CCTDI and its corrected sub-test scores as post-test.

Sub tests	Source of variance	Sum of squares	sd	Mean square	F	P	η2
TS	Pre-test	215,580	1	215,580	7,654	,008	,140
	Group (E/C)	5263,960	1	5263,960	186,894	,000	,799
	Error	1323,780	47	28,166			
	Total	9253,733	49				
OM	Pre-test	3378,817	1	3378,817	88,794	,000	,654
	Group (E/C)	2264,840	1	2264,840	59,519	,000	,559
	Error	1788,463	47	38,052			
	Total	7411,780	49				
AN	Pre-test	1312,398	1	1312,398	188,654	,000	,801
	Group (E/C)	50,333	1	50,333	7,235	,010	,133
	Error	326,962	47	6,957			
	Total	1678,080	49				
SY	Pre-test	185,950	1	185,950	3,064	,087	,061
	Group (E/C)	2835,426	1	2835,426	46,719	,000	,499
	Error	2852,450	47	60,690			
	Total	5835,920	49				
CIR	Pre-test	237,342	1	237,342	15,695	,000	,250
	Group (E/C)	175,069	1	175,069	11,577	,001	,198
	Error	710,738	47	15,122			
	Total	948,580	49				
IN	Pre-test	474,037	1	474,037	23,347	,000	,332
	Group (E/C)	166,277	1	166,277	8,189	,006	,148
	Error	954,283	47	20,034			
	Total	1428,500	49				
Total	Pre-test	5351,921	1	5351,921	23,73	,000	,336
	Group (E/C)	73470,730	1	73470,730	325,946	,000	,874
	Error	10594,159	47	225,408			
	Total	89214,000	49				

p<,01

CCTDI was performed four weeks after post-test on experimental group in order to determine the continuity of training program as it is a follow-up test. T-test was performed in order to compare the post-test and follow-up test scores. The results are shown on the Table 5 below.

Table 5. T-test results of experimental group students' post-test and follow-up test scores.

Sub-Scale	Group	N	X	SS	Sd	t	p
TS	Post-test	25	44,84	6,72	24	2,138	,043*
	Retension	25	44,68	6,81			
OM	Post-test	25	47,08	9,58	24	1,899	,070
	Retension	25	46,80	9,64			
AN	Post-test	25	51,60	5,80	24	1,732	,096
	Retension	25	51,40	5,86			
SY	Post-test	25	35,52	10,58	24	,811	,425
	Retension	25	35,40	10,61			
CIR	Post-test	25	41,92	7,23	24	1,809	,083
	Retension	25	41,80	7,20			
IN	Post-test	25	37,52	6,15	24	1,549	,134
	Retension	25	37,32	6,10			
Total	Post-test	25	275,32	37,29	24	1,946	,064
	Retension	25	257,44	20,27			

*p<,05, p>,05

Considering the results on Table 5, as results of t-test there is no significance between post-test and follow-up test scores [t(24)=1,946; p>,05)].For open-mindedness [t(24)=1,899; p>,05)], for analyticity [t(24)=1,732; p>,05)], for confidence in reasoning [t(24)=1,809; p>,05)], for inquisitiveness [t(24)=1,549; p>,05)].

As result of these findings we can say that training program has continuity. But only for sub-test of truth-seeking there is significance between post-test and follow-up test scores [t(24)=2,138; p< ,05)].

Discussion

It was aimed that to improve 2nd grade preschool teacher candidates' critical thinking skills by using a training program based on educational drama. Students were asked to be aware of preschool children's cognitive processes by using their own thinking processes. If we look at the results, we can see that there is significance between the pre-test and post-test scores of CCTDI and so for its subtests (p< ,05).Another finding is that training program has continuity. There is no significance between post-test and follow-up test scores of CCTDI and so for its sub-tests except truth-seeking. Environmental factors or group's features may be the reason of this significance. These results show that, educational drama based critical thinking skills training program has an effect to promote the students' critical thinking skills.

Educators who have critical thinking skills and well equipped are necessary to ensure students to have these skills. Educators who are thinking, asking and innovative (Kavcar, 1999) are important to reintroduce students into the society. In our study it was aimed that, promoting students' critical thinking skills by ensuring them to inquiry, find different solutions, consider different ideas in the edge of training program. Systematic and model based training programs are effective on promoting critical thinking skills.

In many studies, they indicated that critical thinking skills can be promoted by using different or combined techniques or training programs based on them. Kimmel (1995) stated that, students' acting a role, cooperating, modeling or using such different techniques according to a case which they were offered, helps them to promote their critical thinking skills. Şahinel (2001) studied on promoting students' critical thinking and language skills as an experimental study. As the result of this study, experimental group had better of critical thinking and language skills as a result of training program. As a similar result Semerci (2003) studies on bachelor degree students' critical thinking skills as an experimental study. As a result of this study, students had better of critical thinking skills after courses given. Morey (2008) studied on critical thinking skills of students who are attending to a program as an experimental study. As a result of this study, there was no significance between control and experimental groups before, but after.

Promoting students' creativity, problem solving skills, critical thinking skills, meta-cognition skills are some important aims of educational processes. These kind of cognitive processes are seen so important and tried to be improved by special trainings or programs. Students' critical thinking skills have always been tried to be improved by using different techniques or methods. Thinking skills shape students' future (Güneş, 2012).In our study it was tried that, to improve teacher candidates' critical thinking skills by using educational drama based training program. Teacher candidates should help students to improve their inquisitiveness, inquiry and communication skills as they are future teachers. Facione and Facione (1997), Paul (1995), Daly (2001), Yang and Chung (2001), Helpern (2001), studied on students' critical thinking skills as experimental studies and they all found significance on behalf of experimental groups. These studies support our results. Critical thinking process is a process that, one's not accepting new knowledge but criticizing, inquiring and adapting. Reintroducing the people into the society who are consistent, sufficient and can inquiry, criticize is important for future to be creative.

Researchers may develop different training programs and implement them on different grades or departments. Training programs towards to improve thinking skills may be developed and correlations between different variables may be examined. The training program which has been developed by this study may be enriched different drama techniques or may be implemented on different time lines or groups.

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