



Research Article

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The effect of teaching philosophy on the critical thinking of female students

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ABSTRACT

With the purpose of determining the effect of teaching philosophy on critical thinking of students, based on quasi-experimental method with unequal-group comparison plan, from among the population, female students of third-year guidance school in Hamedan in the academic year 2010-2011, a sample size of 40 was selected by multistage cluster sampling method in the form of two classes. They were randomly assigned to experimental and control groups. Both groups were given pre-test using California Critical Thinking Skills Test (Form B). Then the experimental group, during three months for 18 hours in nine teaching sessions, received two hours of teaching philosophy in form of philosophical stories and using research community method. Then the two groups were given post-tests based on the mentioned test. After that, the data was analyzed after reviewing the necessary hypotheses by analysis of covariance. The results showed that teaching philosophy could improve critical thinking of the students in the experimental group was compared with control group. Thus, the research hypothesis was confirmed, and it can be concluded that by teaching philosophy, one can enhance reasoning skills and as a result students' critical thinking. Therefore, it is suggested that teaching philosophy be included in students' curriculum.

Keywords: *critical thinking, teaching philosophy, reasoning skills, students Ultrasound*

INTRODUCTION

Since, it is the students' mind that matters, what school can or should do for them is nurturing their thinking power (Dewey, according to Fisher, translation by Kianzadeh, 2009). The challenges to improve thinking, nurturing, and language education exist in the hearts of the

education. This challenge also lies at the heart of cosmopolitan philosophy for children, a movement that nurtures the students of any age and any level of talent in more than thirty countries around the world by using philosophical exploration, thinking skills, and literacy and language (Fisher, 2009). Michael Scriven (1985; quoted by Red, 1998) believes that "teaching critical thinking" should be the first duty of education in society. Ennis, Lipman, and Paul (1989; quoted by Simpson, 2002) believe that educating people with thought, must be the first objective of education. According to Paul Walder (2002 a and d), the product of education should be the "exploring mind."

What is called Philosophy for Children is an effort to expand the philosophy, with the purpose of being able to use it as a kind of training. This philosophy is a teaching that uses philosophy to make the minds of students to try to meet the needs and longing that it has towards meaning. Philosophy teaches children in a way that makes their perspective wider. Philosophy for Children is a program that includes schoolchildren in all class discussions on philosophical

subjects. This program seeks to improve children's thinking through the introduction of many big questions to them and enabling them to examine such questions. Teachers using this program encourage children to think more deeply about ideas after their schoolwork.

Simpson (2002) has shown that the use of discussion, written assignments, questioning, role-playing, and learning in small groups have a significant impact on critical thinking of the subjects. Allen (1988) in a survey of 23 students as the experimental group showed that these students, who had attended classes of teaching philosophy to children, have better comprehension, reading, and thinking performance compared to the control group. Holder (1992) in collaboration with Institute for the Advancement of Philosophy for Children (IPAC) conducted research in the Philippines. Using New Jersey Test of Reasoning Skills in form of pre and posttests, they showed the positive effects of the program on students in the experimental group. Fields (1995, quoting Jahani, 2001) conducted a study on students, where the obtained result confirmed that better performance of the students participating in the philosophy class regarding reasoning test than the control group. Malmhester (1999) in a long study that lasted 6 years using the educational program of Philosophy for Children designed a program. The results showed that the students of the experimental group, who had taken part in various academic achievement tests, had significant differences with the control group in various fields, such as math achievement test, New Jersey Test of Reasoning Skills, and reading test. Moriyon (2000) conducted research on evaluation of teaching philosophy to children using New Jersey Test of Reasoning Skills (NJTRS) in form of post-test. He found that running this program has a positive effect on improving reading comprehension and cognitive abilities of the experimental group. In a study of teaching philosophy to children using NJTRS, Monts and Maria (2001) reported that students participating in the program had better reasoning and critical thinking skills compared to the students who had not had participated in the program. By studying excelled students, Haimer (2002) showed the positive effects of teaching philosophy to children in the areas of critical thinking, conceptual reasoning, and philosophical study.

In research, Shabani (1999) studied the effects of problem solving in team on critical thinking and academic achievement of students of elementary schools in the fifth grade. The results indicated the positive effect of problem solving on critical thinking skills and overall the scores of the experimental group had significant differences with the control group and the experimental group achieved higher scores. In a study, Athari, Sharif, Nematbakhsh, and Babamohamadi (2009) found that the mean score of critical thinking skills of the subjects studied was 12.48, and the scores of critical thinking skills test of students on admission to the university are not so desirable.

In a study in order to explore the effects of different creativity training methods on nurturing research tendency among teenagers, on a sample of 75 guidance school students of second and third grades of Shiraz, Jahani (2006) found that teaching philosophy has nurtured creativity among students and developed their reasoning skills. The results also showed that if the teaching philosophy is done in the class through research approach, the results of nurturing students' reasoning skills and creativity are better than the normal method of teaching philosophy.

In a study, Kazemi (2000; quoted Islami, 2003) evaluated the effect of problem solving on nurturing logical thinking and concluded that problem solving method is more efficient in nurturing logical thinking than the usual method of teachers.

The hypothesis of the study: teaching philosophy to children leads to improvement in critical thinking in third grade guidance school girls in Hamedan.

Materials and Methods

In the present study to test the hypothesis, quasi-experimental method with unequal-group comparison plan were used. The study population included all third grade girl students in guidance state schools of Education Region 2 in the academic year 2010-2011 in Hamadan that according to the statistics obtained are 1959 people. As in the experimental research at least 15 samples for each group have been proposed (Cohen and Manion 2000; Delavar, 2011), in this study, the least number of students in the class for each experimental and control groups was determined as 20. Multistage randomized cluster-sampling method was used to select the sample in this study. In the first stage, the sample selection was guidance high school. For this purpose, from among 22 state guidance schools in Region 2 for girls in Hamedan, one school was randomly selected. To do this, a number was assigned to the list of

state guidance schools Region 2, and using random numbers table, a school was randomly selected. In the second stage, sampling selection unit was class, i.e., from among five third-grade guidance classes of Shahid Nassiri, two classes were randomly selected. Finally, from the two classes selected randomly one class was set in the control and the other in the experimental group. In order to teach philosophy to students, a series of intellectual stories (philosophical explorations for children), written by Philip Cam (partner of Matthew Lippmann) was used. This guidebook provides suggestions about how to teach a philosophical lesson. It contains fundamental principles that teachers must learn to conduct a philosophical discussion: it tells the teacher how to use plans discussed and exercises in the book. The methods of teaching these stories was that initially after the initial communication with the school and obtaining licenses from the Education of Region 2, Hamadan, and the required coordination with respected principal, in accordance with the explanations about sampling, experimental and control groups were identified. The class that included the experimental group (Class 1) was 27 students and the control group class (Class 5) was 28 people, and the sample was 20. As all the students were required to attend the classes, all participated in the process of study, but only 20 of them, in accordance with the school list, were selected randomly, coded, and results of those twenty were registered and investigated.

In the past research, to assess critical thinking, valid tests, such as critical thinking test of Cornell, Critical Thinking Test of Watson – Glaser, and California Critical Thinking Skills Test are used. In the meantime, The California Critical Thinking Skills Test is used more than the others are in the world and in Iran, this test is the only test used in research in this field.

In addition to using frequency and percentage tables and graphs, descriptive statistics of central tendency, measures of variation, and descriptive statistics were used to describe the data. Besides, to test the hypothesis, analysis of covariance (ANCOVA) was used. However, before ANCOVA, outlier, and extreme values were dealt with using outbox, and then the assumptions of using parametric statistic were assessed. Normal distribution of data was tested by Kolmogorov-Smirnov test and shown by drawing histogram with normal curve. Then, the homogeneity of regression slopes was dealt with by analysis of variance (ANOVA) and scatterplot was drawn for checking the linearity of the relationship. Then Leven's test was conducted to examine the assumption of equality of variances error. It should be mentioned that the SPSS software was used for data analysis.

Results and Discussion

Descriptive indicators of pretest of critical thinking of the groups are presented in Table 1.

Table 1: Descriptive indicators of pretest of critical thinking of the groups

Group	N	\bar{X}	$S_{\bar{X}}$	Min	Max	R	S^2	S	SK	SE_{SK}	KU	SE_{ku}
Experimental	20	8.3	0.558	3	11	8	6.221	2.494	-0.923	0.512	-0.557	0.992
Control	18	7.61	0.354	5	10	5	2.252	1.501	0.228	0.536	-0.756	1.038
Total	38	7.97	0.338	3	11	8	4.351	2.086	-0.491	0.383	0.680	0.750

According to Table 1, it is observed that pre-test mean of critical thinking scores in the experimental group is 8.3 and standard deviation is 2.494, pre-test mean of critical thinking scores in the control group is 7.61 and standard deviation is 1.501. Moreover, the overall mean of whole sample in pretest is 7.97 and SD is 2.086.

Descriptive indicators of critical thinking in posttest are presented in Table 2.

Table 2: Descriptive indicators of posttest of critical thinking of the groups

Group	N	\bar{X}	$S_{\bar{X}}$	Min	Max	R	S^2	S	SK	SE_{SK}	KU	SE_{ku}
Experimental	20	8.7	0.534	5	13	8	0.6955	0.3862	0.008	0.512	-1.541	0.992
Control	20	7.35	0.554	3	12	9	6.134	2.447	0.269	0.512	0.738	0.992
Total	20	8.03	0.395	3	13	10	6.230	2.496	0.95	0.374	-0.918	0.773

According to Table 2, it is observed that posttest mean of critical thinking scores in the experimental group is 8.7 and standard deviation is 2.386, pre-test mean of critical thinking scores in the control group is 7.35 and standard deviation is 2.477. Moreover, the overall mean of whole sample in posttest is 8.03 and SD is 2.496.

To investigate the effect of teaching philosophy on critical thinking of students, covariance was used, where first the presumptions required for studying these tests are investigated.

Homogeneity of regression slopes

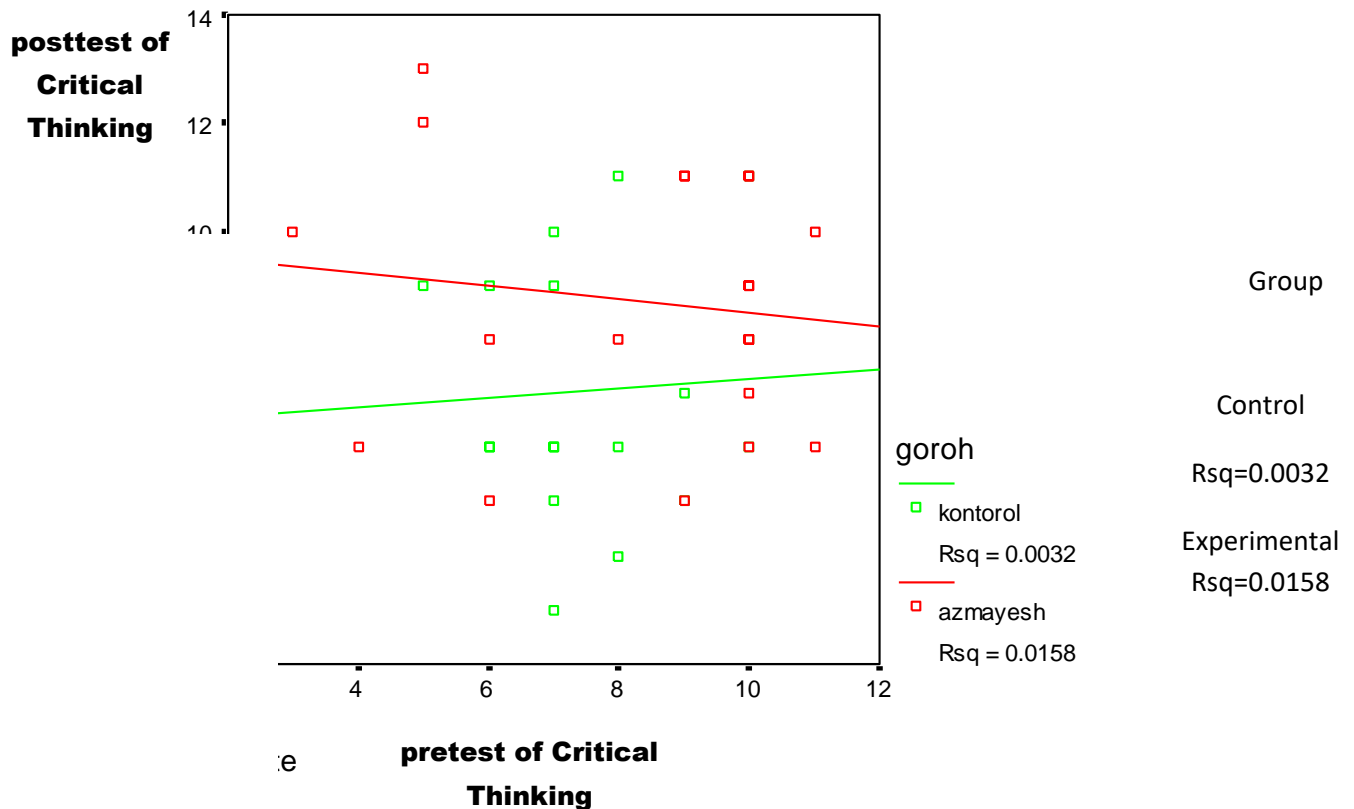
This assumption means the equality of the relationship between pre- and post-test scores of critical thinking in both the experimental and control groups. To examine this assumption, covariance analysis is used, the results of which are presented in Table 3.

Table 3: Summary of analysis of variance to study the homogeneity of regression slopes for students' critical thinking scores

Sources of changes	SS	df	MS	F	P
Group	4.992	1	4.992	0.852	0.362
Post test	0.029	1	0.029	0.005	0.944
Group \times pre-test	1.259	1	1.259	0.215	0.646
Error	199.138	34	5.857		
Total	2611	38			

Analysis of variance showed that the relationship between the groups and the critical thinking test scores is not statistically significant ($F_{(1,34)}=0.215$, $P=0.646$).

Thus, data supports the hypothesis of homogeneity of regression slopes. This issued is followed by drawing scatter plot.



Graph 1: Diagram of distribution of scores of critical thinking in the pre-test and post-test

As is seen, there is as a kind of linear relationship between auxiliary random variables (pre-test) and the dependent variable (post-test). Therefore, the assumption of the linear relationship between auxiliary random variables and the dependent variable is confirmed.

The results of Leven statistic for investigating the assumption of homogeneity of variances error are presented in Table 4.

Table 4: Leven test for investigating the assumption of homogeneity of variances error

P	df_2	df_1	F
0.931	36	1	0.008

Leven's test results about critical thinking scores show that the assumption of the equality of error of variance is not violated, so variances are homogeneous ($F_{(1,36)}=0.008$, $P=0.931$).

Covariance analysis to examine the main effect of teaching philosophy on critical thinking of students is presented in Table 5.

Table 5: Summary of analysis of covariance of the effect of teaching philosophy on critical thinking of students

Source of changes	SS	df	MS	F	P
Group	26.366	1	26.366	4.605	0.039
Error	200.398	35	5.726		

Total	2611	38		
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P<0.05

The results of covariance analysis to test the hypothesis of this study show that teaching philosophy has significant main effect on critical thinking of students ($F_{(1,35)}=4.605, P=0.05$).

Table 6: Adjusted mean of critical thinking of experimental and control groups

Group	\bar{X}	$S_{\bar{X}}$	Confidence 0.95%	
			Low	High
Experimental	8.723	0.539	7.629	9.816
Control	7.031	0.568	5.877	8.184

The results show that the adjusted mean scores of critical thinking for the experimental group is (8.72) higher than the control group (7.03). Thus, the hypothesis is confirmed, and it can be concluded that teaching philosophy improves students' critical thinking.

Conclusion

The results of testing hypothesis showed that teaching philosophy to children in third grade guidance school has improved critical thinking; this increase is statistically significant, so the hypothesis is confirmed. This results is consistent with the results of the studies conducted by Lipman and Bearman (1970), Cummings (1981), Iorio, Nistain and Martin (1984), Jackson and Deutsch (1987), Allen (1988), Holder (1992), Fields (1995), Sprod (1997), Malmehester (1999), Moriyon (2000), Monts and Maria (2001), Haimer (2002) Kazemi (2000; quoted from Islami, 2003), Jahani (2006), Safaei Marashi, Pakseresht, Bagheri and Sepasi (2006), Athari, Sharif, Nematbakhsh, and Babamohamadi (2009), Jamshidian, Gale Sefidi, and Khamjiani Farahani (2009). Philosophy gives the young people an opportunity to try to digest a wide range of personal, moral, and social issues, and be more aware of themselves as critical thinkers. Children who engage in philosophy see themselves and the world from a new way of viewing. They reach ideas that otherwise would not cross their minds. They create links that lead to a deeper understanding and become a part of a tradition over 2500 years old. In this case, it is not limited to others' answers, but they are free to search for new possibilities and new ways of thinking. They become more and more aware of their being thinkers, as an 11-year-old child in one sentence says, "Philosophy is an activity in which people teach themselves to be better thinkers." Philosophy can cause children to think with one another, in groups or classmates, and separately as private.

Philosophy for children wants to be an answer to uncritical thinking, poor insight, prejudice, and disregard for the views. It can lead to encourage curiosity and questioning power, wisdom strengthening due to argument, progress in understanding the concepts discussed, fostering the ability to engage in dialogue and logical excavation, an answer to fanatical, backward and ill-advised thinking, and encourage students to consider different and the logical opinions.

Limpman (quoted by Safayi Moghaddam, 1998) believed that if child's natural curiosity and desire to know about the world are associated with philosophy, we could change children to critical thinkers who are more critical, flexible, and effective than before. Fisher (1995) believes that Philosophy for Children is a successful method for teaching thinking. Global experience and evidence obtained in more than fifty countries shows that Philosophy for Children has helped the growth of thinking skills in children (Fischer, 1998).

Philosophy for Children Association of New Zealand (2004), quoting Safayi Moghaddam, Marashi, Pakseresht, Bagheri, and Sepasi (2006), states that this program leads to growth of critical, creative, and responsible thinking in children (Safayi Moghaddam, 1998).

Thus, it can be concluded that teaching philosophy through improving critical thinking skills has led to promotion of students' reasoning.

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