

The effect of cooperative learning on students' social skills in the experimental science course

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ABSTRACT

Present study is about the effects of cooperative learning on development of guidance school first grade students' social skills in the experimental science course in Hashtrud. The study method is quasi-experimental with pre- and posttests. The universe includes she- and he-students of first grade of guidance schools in Hashtrud of them one hundred ones (Four classes) were selected by random cluster sampling method ; 49 ones of them (One she- and one he-students class) were selected randomly as the test group to apply the independent variable (Cooperative learning) namely 25 he-students and 24 she-students . Also 51 ones (One she- and one he-students class) were selected as the control group for traditional learning including 23 he- and one 28 she-students . The measurement device included 40 questions to test the development of the students' social skills. The subjects attended in pre- and posttests about the social skills six weeks after performing the tentative variable and their social skills were measured. T-test and dependent T were used to analyze the data the study data indicated that the social skills of the test group who had learned by cooperative method were more than the control group who had learned by traditional method and the differences of their means were significant. In addition, the he-students had high social students than the she- ones in the cooperative attitude.

Keywords: Cooperative learning, traditional learning, social skills development.

1. Introduction:

In contemporary world wonderful development of science, technology and culture are accompanied with developing and changing science and technology learning. By virtue of scientific examinations the increasing importance of the learning methods becomes more prominent as much as other sciences and researches; in other words, nowadays dynamic science and technology have developed so vastly that the only learning way is accurate education, scientific methods application and benefiting from vast and deep learning study's findings with contemporary dynamic world developments (Fathiazar , 2003) .

Having changed vastly and continuously the training – learning methods , training strategies and innovations in the field the teachers benefit from new applied and effective training – learning methods and if these are identified and learned well by the teachers , there are good learning facilities to solve properly the problems of the classes in the best way (Majdfar , 2000) .

The teachers have emphasized on traditional methods specially lecturing and encourages the students to know by heart and recite the subjects in Iran education system since a long time and notwithstanding the educational and scientific boards discuss about considering and even executing active and free thought students plan it seems they have done nothing practically on one hand and on the other hand , they say the students should have more cooperation and friendship spirit and social development , but in practice , nothing is done in line with this and the cooperation and friendship often become competition finally led to more jealousy and hostility among them . The class training methods are mostly traditional namely the students encounter rarely with challengeable situations in learning notions and have less interactions , cooperation and discussion with their teachers and competition replaces cooperation and escape from collectivism and interested in isolation (Keramati , 1997) . The educational specialists believe that the students who learn through active learning not only learn better, but also enjoy learning more because instead of only listening they participate actively in the learning and consider themselves responsible of their learning (Gardner, John, N & A. Jerome Jewler , mentioned by Keramati , 2003) . Nowadays the specialists are interested in some active methods such cooperative learning ; The studies evidences show that the most problems due to traditional and inactive method are the least in the cooperative attitude ; for example , Slavin has found some evidences in his studies indicating the cooperative learning method improves the relations of the students with different races in the classes and promotes their self-esteem and other positive affective characteristics (Slavin mentioned by Seif , 2002) .

Notwithstanding previous studies indicating mostly the superiority of the cooperative learning methods in educational development this study is to examine the effect of cooperative learning on the students' social skills to define the efficiency of the cooperative learning methods both in students' educational development and social

skills . It is hoped that the study findings increase the respected educational programmers' and authorities' knowledge to train better dear students the social skills to enable them to play successfully their social roles.

Recent vast researches concerning learning through cooperative learning have refused the view indicating competitive atmosphere leads to the best learning for the child and competition increases greatly the efficiency. In a more comprehensive analysis including 122 examinations by Johnson and Johnson and Score they concluded that cooperation has superiority to other factors (Competition and personal attempt) in relation to development and creativity increase and cooperation without competition in the group leads to more development and creativity than the cooperation with competition in the group (Kartleg , J. & Milbern , F. , 1996) .

R. Slavin and S. Sharan (2004) examined both dimensions and proved that the efficiency of cooperative learning methods has been considerably in development and creates more positive relations among the students with different races , increases their self-esteem , makes them have more affection for their classmates and teachers and more self-control .

Sharan (1980) points to the usefulness of collective method because of high level of learning without losing basic data to be learned and so improved class atmosphere.

Having done 37 composite and super analytic studies Newman and Thompson found that the cooperative learning had superiority to the traditional one 98 percent of the cases (Newman and Thompson mentioned by Fathiazar , 2003) .

J. Hartap believes that when some responsibility is transferred to a student(s) and teach(es) other classmates he(She , they) learn(s) more and has(have) more motivation for the subject and has(have) better educational efficiency . In addition, the students' self-esteem and social behavior are improved (Mentioned by Talebi , 2005) . Slavin's studies indicate the students learned by collective method have better friendship and social behavior than ones of the control group and have more tendency to respect others and values . The findings of done studies indicate cooperative learning may be fruitful for the learners in following fields (S. Kagan , 2002) :

- 1 – Students' learning increase and their educational development.
- 2 – Improved learners' memory.
- 3 – More learners' satisfaction concerning their learning experience.
- 4 – Helping the learners' to develop verbal skills.
- 5 – Development of learners' social skills.
- 6 – Students' self-esteem promotion.
- 7 – Helping the improvement of the relations between the races.
- 8 – Improved students' positive attitudes towards learning, school, classmates and themselves.

The findings of the studies and examinations about the educational system insufficiencies in recent years indicate the state training – learning process has encountered with serious problems ; for example , the findings of TIMSS (Third International Mathematical and Science Study) about the students' efficiency indicate weak Iranian students' efficiency specially in relation to the sciences (Kiamanesh , 2000) .

The findings of TIMSS indicate the students' ability in high levels of learning especially operational and procedural skills are less than the students' in other countries. Considering in Iran and other countries the contents of mathematics subject are the same the weakness in Iran may be because of improper learning and training methods and practically leads the students to the method emphasized on learning through knowing by heart so it is necessary to review the training and learning methods and go towards new educational methods (Kiamanesh et al. 1997) .

There are internal and external insufficiencies of education in different levels, superficial and unstable learning and wrong educational competition between the stronger students due to traditional methods dominant at Iran schools so it is necessary to develop friendship and spirit, cooperation and social skills development and train how to solve the problems.

Considering essential role of social skills in interpersonal relations and their acquired characteristics on one hand and the relation of the social skills with educational development and their role in decreasing mental and spiritual disorders and moral deviations on the other hand it is necessary to teach them. So by virtue of the issue importance specially learning in the level of public learning it is necessary to do studies and take into consideration the studies' findings in this regard to provide the introduction of applying active methods of training – learning in the classes ; then the community would accept the process and the learners would learn social skills .

2. Hypotheses and the question of the study:

The study examines following hypotheses:

- 1 – The students' skills of the cooperative group are more than the students' benefited from the traditional method.
- 2 - The students' respect skills of the cooperative group are more than the students' benefited from the traditional method.
- 3 - The students' skills to observe regulations of the cooperative group are more than the students' benefited from the traditional method.
- 4 - The students' skills to do duties of the cooperative group are more than the students' benefited from the traditional method.
- 5 - The students' skills to tolerate learning of the cooperative group are more than the students' benefited from the traditional method.
- 7 - The students' social skills of the cooperative group are more than the students' benefited from the traditional method.

3. The universe:

In this study the universe included all she- and he-students of first grade of guidance schools in Hashtrood namely 418 ones of them 175 and 243 ones were she- and he-students, respectively.

Universe and sampling method:

The random cluster sampling method was used to select the universe so four classes of Hashtrood were selected randomly (two classes were for the he-students and two other classes).

By virtue of the sampling method and high volume of the sample the universe included four classes of first grade of guidance schools in Hashtrood of them two classes were for the he-students and two other classes were for the she-students. One class of 25 he-students and another class of 24 she-students were selected as the experimental group (By cooperative method) and two other classes with 28 he-students were selected as the control group (By traditional method) to learn .

3.1. Study device, its validity and stability:

The device is questionnaire including 40 questions with three choices to assess the students' social skills development; the questions assess the students' social skills by virtue of the study hypotheses; the elements include the skills to respect people, observe regulations, do duties, collective activity and tolerance.

The test was designed and validated by Mohammadreza Keramati as his doctorate thesis based on the views of Gut and Sefran , Damas , Smith , Tekek , Milborn etc. and the reliability coefficient was 0.895 . Considering the questionnaire was used in this study after a little change the researcher used it in a sample of 20 subjects (In addition to the test and control groups) and Cronbach alpha reliability coefficient which had been proper to gain the questionnaire reliability in order to find the questionnaire reliability which was 0.744. Also the viewpoints of the guidance and other professors and other sources were taken into consideration to be sure about the device reliability.

3.2. Study design:

The design was done by semi-experimental method benefiting two (Witness and experimental) groups in a way that the approximately congruous subjects were divided into the 'A' and 'B' groups which are experimental and control groups , respectively . The latter is influenced by independent variable and the former is not influenced by it. The method was pre- and posttest namely both experimental and control groups were tested in relation to social skills development before applying the variables and their situations became clear ; then the experimental group was influenced by the independent variable : cooperative learning ; then both groups were tested and the findings of both tests were compared with each other.

Generally the design was executed as follows:

(Experimental groups) E: O1 X O2
 (Control group) C: O3 X O4

4. Descriptive findings:

Table1: Descriptive statistics concerning the subjects' scores in the social skills pre- and posttests.

Index	Mean		DS		Variance		MDS	
	Pre.	Post.	Pre.	Post.	Pre.	Post.	Pre.	Post.
Ex. group	64.73	75.93	8.33	7.86	69.42	61.82	1.24	1.19
Control group	66.66	62.52	7.58	10.32	57.54	106.69	1.13	1.59

Pre: Pretest

Post: Posttest

Ex: Experimental

DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard

In Table 1 the mean , cooperative learning , Deviation standard and mean Deviation standard concerning the students of the experimental and control groups are shown separately in Table 1 indicating the experimental group operation is considerable in proportion to the control one . The experimental group mean was about 64.73 in the pretest of social skills development and the mean increased to 75.93 in the posttest because of training the subjects while the posttest and pretest of the control group had not any considerable difference and even the control group mean decreased in the posttest indicating cooperative learning, if trained, has had considerable effect on the experimental group subjects. Having compared the means of experimental and control groups it was shown that they had the same social skills before training and had a little difference due to chance or other factors.

Inferential findings:

Independent "T" significance test was used to test hypotheses and 7th hypothesis was tested by dependent "T".

H1: The skills of the cooperative learning group are more than the traditional one.

Table 2: The findings of independent "T" test to examine the means' difference between the two groups in the posttest:

Index	N	Mean	DS	MDS	MDDS	fd	Calculated T	Significance rate
Ex	48	13.83	1.88	0.269	0.493	94	6.65	0.001
Control	46	10.55	2.86	0.417				

Ex: Experimental
 DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard
 Fd : Freedom degree

By virtue of above Table it is concluded that the skills of the cooperative learning group are more than the traditional one namely the difference is significant in the rate: $P < 0.05$ so H_0 is refused and H_1 is proved namely above hypothesis is right so in relation to H_1 it is concluded that by virtue of above Table it is concluded that the skills of the cooperative learning group are more than the traditional one. It can be said that there is statistically a significant difference between the two groups and the experimental group subjects trained by cooperative method had considerably more cooperative skills than the control group subjects trained by traditional and usual methods.

H2: The skills to respect others are more in the cooperative learning method than the traditional one.

Table 3: The findings of independent "T" test to examine the means' difference between the two groups in the posttest:

Index	N	Mean	DS	MDS	MDDS	fd	Calculated T	Significance rate
Ex	47	14.66	1.38	0.2005	0.434	96	6.59	0.001
Control	50	11.80	2.68	0.38				

Ex: Experimental
 DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard
 Fd : Freedom degree

By virtue of above Table it is concluded that the skills to respects others are more in the cooperative learning group than the traditional one namely the difference is significant in the rate: $P < 0.05$ so H_0 is refused and above hypothesis is proved.

H3: The skills to observe regulations are more in the cooperative learning method than the traditional one.

Table 4: The findings of independent 'T' test to examine the means' difference between the two groups in the posttest:

Index	N	Mean	DS	MDS	MDDS	Fd	Calculated T	Significance rate
Ex	48	5.33	0.907	0.130	0.456	96	1.91	0.058
Control	49	4.46	3.03	0.428				

Ex: Experimental
 DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard
 Fd : Freedom degree

By virtue of Table 4 it is concluded that the skills to observe regulations are more in the cooperative learning group than the traditional one namely the difference is not significant in the rate: $P < 0.05$ so H_0 is proved and above hypothesis is refused.

H4: The skills to execute duties are more in the cooperative learning method than the traditional one.

Table 5: The findings of independent 'T' test to examine the means' difference between the two groups in the posttest:

Index	N	Mean	DS	MDS	MDDS	Fd	Calculated T	Significance rate
Ex	47	7.12	1.15	1.168	0.303	93	3.71	0.001
Control	45	6	1.73	0.250				

Ex: Experimental
 DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard
 Fd : Freedom degree

By virtue of Table 5 it is concluded that the skills to execute duties are more in the cooperative learning group than the traditional one namely the difference is significant in the rate: $P < 0.05$ so H_0 is refused and above hypothesis is proved.

H5: The skills to tolerate are more in the cooperative learning method than the traditional one.

Table 6: The findings of independent 'T' test to examine the means' difference between the two groups in the posttest:

Index	N	Mean	DS	MDS	MDDS	Fd	Calculated T	Significance rate
Ex	45	15.23	4.21	0.621	0.826	93	2.97	0.001
Control	48	12.75	2.88	0.560				

Ex: Experimental
 DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard
 Fd : Freedom degree

By virtue of Table 6 it is concluded that the skill to tolerate is more in the cooperative learning group than the traditional one namely the difference is significant in the rate: $P < 0.05$ so H_0 is refused and above hypothesis is proved.

H6: Is there any difference between the she- and he-students' social skills in the cooperative and traditional learning methods?

Table 7: The findings of independent 'T' test to examine the means' difference between the two groups (She- and he-) in the posttest:

Index	N	Mean	DS	MDS	MDDS	Fd	Calculated T	Significance rate
She-students	22	77	7.04	1.150	3.605	37	2.82	0.008
He-students	21	74.80	8.66	1.89				

Ex: Experimental

DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard
 Fd : Freedom degree

By virtue of Table 7 it is concluded that there is a significant difference between the she- and he-students' social skills in the cooperative method so it can be said that the he-students trained by the cooperative method compared to the she-students had higher social skills so H0 is refused and above hypothesis is proved .

Table 20 – 4: The findings of independent 'T' test to examine the means' difference between the two (She- and he-) groups in the posttest:

Index	N	Mean	DS	MDS	MDDS	Fd	Calculated T	Significance rate
She-students	17	65.17	8.71	2.21	3.568	36	0.91	0.369
He-students	25	60.72	11.10	2.22				

Ex: Experimental
 DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard
 Fd : Freedom degree

By virtue of above Table it is concluded that there is no significant difference between the she- and he-students' social skills in the traditional learning methods.

H7: Social skills are more in the cooperative learning method than in the traditional ones.

Table 8: The findings of independent 'T' test for the experimental group pre- and posttests:

Index	N	Mean	DS	MDS	MDDS	Fd	Calculated T	Significance rate
She-students	43	64.73	8.33	1.24	1.94	38	5.404	0.001
He-students	42	75.93	7.86	1.59				

Ex: Experimental
 DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard
 Fd : Freedom degree

By virtue of above Table the social skills of experimental group in posttest have increased considerably compared to pretest due to positive effect of cooperative learning namely it is significant in the rate: $P < 0.05$ so H0 is refused and H1 is proved and above hypothesis is confirmed. So about hypothesis 7 it can be said the subjects' scores mean difference of experimental group is statistically significant in pre- and posttests.

Table 9: The findings of independent 'T' test to examine the means difference between cooperative and traditional groups in relation to social skills in pretest:

Index	N	Mean	DS	MDS	MDDS	Fd	Calculated T	Significance rate
She-students	43	64.73	8.33	1.24	1.66	89	- 1.19	0.236
He-students	45	66.66	7.83	1.13				

Ex: Experimental
 DS: Deviation standard
 MDS: Mean deviation standard
 MDDS: Means difference deviation standard
 Fd : Freedom degree

By virtue of above Table it is concluded that there is no significant difference between social skills in the cooperative and traditional groups namely the difference is significant in the rate: $P < 0.05$.

Side findings:

Present study findings confirm the hypotheses and indicate that the cooperative learning has influenced positively the students' skill to find friends and accept responsibility.

Table 10: The findings of independent 'T' test to examine the difference between cooperative and experimental groups in relation to the skill to find friends in posttest:

Index	N	Mean	DS	MDS	MDDS	Fd	Calculated T	Significance rate
She-students	49	9.18	1.18	0.169	0.332	97	4.16	0.001
He-students	50	7.80	2.01	0.284				

Ex: Experimental

DS: Deviation standard

MDS: Mean deviation standard

MDDS: Means difference deviation standard

Fd : Freedom degree

By virtue of Table 10 the social skills to find friends are more in the cooperative group than in the traditional one namely the difference is significant in the rate: $P < 0.05$ so it can be said the subjects' scores mean of the cooperative group was more than the mean of the usual and traditional one in relation to find friends.

Table 11: The findings of independent 'T' test to examine the difference between cooperative and experimental groups in relation to the skill to accept responsibility in posttest:

Index	N	Mean	DS	MDS	MDDS	Fd	Calculated T	Significance rate
She-students	49	10.65	2.34	0.334	0.449	94	5.71	0.001
He-students	47	8.08	2.04	0.297				

Ex: Experimental

DS: Deviation standard

MDS: Mean deviation standard

MDDS: Means difference deviation standard

Fd : Freedom degree

By virtue of Table 11 the social skills to find friends are more in the cooperative group than in the traditional one namely the difference is significant in the rate: $P < 0.05$.

5. Discussions and conclusion:

In this section the study hypotheses are described separately and related findings are discussed and commented and then the conclusion is proposed based on the comments.

Hypothesis 1: The skills of the cooperative learning group are more than the traditional one.

By virtue of the findings mentioned in the inferential findings section the difference between two experimental and control groups' means was shown by 't' parameter test .

So in relation to H1 indicating « The skills of the cooperative learning group are more than the traditional one » it may conclude there was significant difference between the subjects of experimental and cooperative groups and the subjects' skills of the latter were more than the control group trained by the usual and traditional method so the hypothesis is confirmed and H0 is refused.

It should be noted that H1 conclusion was in line with the findings of J. Anders (Mentioned by Shabani , 2003) , R. Slavin (1992) , Morteza (Mentioned by Keramati , 2003) , D. Johnson and R. Johnson (2001) , Keramati (2003) , Ghaltash (2004) and Hlobec (Mentioned by Ghodrati , 2001) and all of them indicate the positive effect of cooperative learning on cooperative activity so the H1 is confirmed .

H2: The skills to respect others are more in the cooperative learning method than the traditional one.

So in relation to H2 indicating « The skills to respect others of the cooperative learning group are more than the traditional one » it may conclude there was statistically significant difference between the subjects of experimental and cooperative groups and the subjects' skills of the latter were more than the control group trained by the usual and traditional method so the hypothesis is confirmed and H0 is refused.

It should be noted that H2 conclusion was in line with the findings of Slavin (1990), Morteza (Mentioned by Keramati , 2003) , D. Johnson and R. Johnson (Mentioned by Kanani , 1999) ,Kagan (2001) , Keramati (1997) and Ghaltash (2004) and all of them indicate the positive effect of cooperative learning on the skills to respect others so the H2 is confirmed .

H3: The skills to observe regulations are more in the cooperative learning method than the traditional one.

So in relation to H3 indicating « The skills to observe regulations of the cooperative learning group are more than the traditional one » it may conclude there was not statistically significant difference between the subjects of experimental and cooperative groups and the subjects' skills of the latter were more than the control group trained by the usual and traditional method so the hypothesis is confirmed and H0 is refused.

It should be noted that H3 conclusion was not in line with the findings of Veenman (1997), Keramati (1997) and Ghaltash (2004) so the H3 is not confirmed.

H4: The skills to do duties are more in the cooperative learning method than the traditional one.

So in relation to H4 indicating « The skills to do duties of the cooperative learning group are more than the traditional one » it may conclude there was statistically significant difference between the subjects of experimental and cooperative groups and the subjects' skills of the latter were more than the control group trained by the usual and traditional method so the hypothesis is confirmed and H0 is refused.

It should be noted that H4 conclusion was in line with the findings of Slavin (1980), Lazarovites (Mentioned by Kanani, 1999), Veenman (Mentioned by Keramati, 1997), Keramati (2003) and Ghaltash (2004) so the H4 is confirmed.

H5: The skills to tolerate are more in the cooperative learning method than the traditional one.

So in relation to H5 indicating « The skills to tolerate of the cooperative learning group are more than the traditional one » it may conclude the subjects' mean of the experimental group trained by the cooperative method was more than the traditional one so it can be said cooperative method had positive effect on the students' tolerance skill so the hypothesis is confirmed and H0 is refused.

It should be noted that H5 conclusion was in line with the findings of Slavin (1980), B. Rogoff (1990), D. Johnson and R. Johnson and A. Smith (1991), Web (2006), Kagan (2000), Joyce et al. (2002), Keramati (2003) and Ghaltash (2004) and all of them indicate the positive effect of tolerance skills so H5 is confirmed.

H6: Is there any difference between the she- and he-students' social skills in the cooperative and traditional learning methods?

So in relation to H6 indicating « Is there any difference between the she- and he-students' social skills in the cooperative and traditional learning methods? » it may conclude there is a significant difference between the means of she and he-students of cooperative group and the social skills of the latter were increased more than the former, but there was no significant difference between them in the traditional group. It should be noted that H6 conclusion was not in line with the findings of Keramati's (1997).

H7: Social skills are more in the cooperative learning method than in the traditional ones.

So in relation to H7 indicating « Social skills are more in the cooperative learning method than in the traditional ones » it may conclude there was a significant difference between the means of the experimental group trained by cooperative method in pre- and posttests and the subjects' means of the posttest of the experimental group were more than the means in the pretest of the same group. So the hypothesis is confirmed and H0 is refused.

It should be noted that H7 conclusion was in line with the findings of Kagan (2000), Sharan (1980), Slavin (1983), D. Johnson and R. Johnson (2001), Joyce et al. (2001), Keramati (1997) and Ghaltash (2004).

6. Propositions:

A: Applicable and executive propositions:

1 – Considering the effect of cooperative method on the students' social skills development confirmed in many researches and in present study so it had better the method to be used as a training – learning method effective in line with students' social skills and replaced usual and traditional ones at schools.

2 – It is proposed related organizations specially education organization to have training workshops to teach the teachers new educational methods especially cooperative learning attitudes to be used continuously in their classes.

3 - It is proposed to have interactions between home, school and parents in relation to know their educational duties more and help them to guide the children concerning the social skills such as responsibility, finding friends, doing duties, tolerance, etc.

4 – By virtue of the study findings the he-students' social skills were more than the she-students' in the cooperative group so it is recommended the teachers and parents pay more attention to the she-students' social skills.

B: Study propositions:

1 – It is proposed this study is repeated in different levels of education (Primary and secondary schools and higher levels) in different parts of the country.

2 - It is proposed by virtue of other attitudes of cooperative learning some studies would be done in different levels of education and different subjects such as basic sciences.

3 - It is proposed the effect of attitudes of cooperative learning would be examined on the educational development and the students' attitude towards learning would be examined in different courses and subjects.

4 - It is proposed in addition to questionnaire other devices such as observation, interview and teachers' and parents' views would be used in next researches.

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