



Comparison Affection of Peer tutoring on pleasure and value of Mathematical, Physics and English languages

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ABSTRACT

The purpose of the current research was to investigate Comparison Affection of Peer tutoring on pleasure and value Mathematical, Physics and English languages lesson. Random sampling method was used. Therefore, 73 students selected from statistical society, and were put randomly in to 3 groups: Mathematical (n= 24), Physics (n= 25) and, English Languages (n= 24). Aiken's Questionnaire (pre-test) was used. The 3 groups were put under peer tutoring for 9 ninety- minute- session. When the training finished, The Questionnaire was conducted for students for a second time (past-test). After exploiting the scores for three groups, the result of ANCOVA in a Significant ($p \leq 0/05$) showed that peer tutoring method has had a significant positive affected on the value of Mathematical, Physics and English language. This method hasn't had a Significant affected of pleasure between groups. Moreover the result of T test in a Significant ($p \leq 0/05$) showed that peer tutoring method has had a significant difference on the value of Mathematical, Physics next Math, English language. Among the three groups, the greatest impact of Peer tutoring on the value in the Physics next English languages. Hadn't has influence strongly toward Math.

KEYWORDS: peer tutoring, pleasure, value

INTRODUCTION

Attitude is people's viewpoint toward objects, people, groups, and topics. the type, point of view, and the way of looking at phenomena are of great importance in the meaning of attitude. It seems that the attitude of individuals towards phenomena, which is caused by the phenomena themselves, generally affects their personality directly. Dealing with the formation of attitudes is of special importance in order to simplify the complex issues, protect self-esteem, adapt to the world and its phenomena, and address the fundamental values (Aghaahmadi & Mobashernia, 2007). Study of the nature, role, and importance of attitude in academic achievement of students has always been of interest to scholars and experts of education. From the perspective of Rogers, attitude of students towards academic-related issues is an important factor in learning and academic achievement. According to his theory, when a student has a good and positive attitude towards a subject, it is more likely that they exhibit more stability and strength in that subject and try to reach higher levels (Stone, 2005). On the other hand, attitudes and values are often treated alike. However, an overview on the attitudes and values is that attitudes can be placed in a continuum that demonstrates an increasing degree of internalization and this the view that has been taken into account in the classification proposed by Krathwohl, Bloom, and Macia (1964) (Fardaeibenam, 2012). Based on this view, the most lax attitudes in these continuum include areas that are referred to as receiving or accepting. Higher degrees of this continuum involve "reply and valuation" and the process of "organizing and personality formation" is located at the last level of this continuum which indicates the value and internalization of attitudes. Hence, attitude can be defined in a four-dimensional framework including cognitive, value, emotional, and behavioral dimensions. Recent studies have shown that how the positive emotions are correlated with a range of relevant motivational variables such as competency beliefs, value of doing the tasks, progress (Frenzel *et al.*, 2007), and interest in studying (Titiz, 2001). If educational activities such as studying and learning are considered valuable by a person and these activities are perceived by that person in a controllable manner, feeling of pleasure and joy will be elicited. Razaviyeh *et al.* (2005) showed that gratification is the strongest predictor of academic achievement in Mathematics. In other words, the students who enjoy engaging in situations requiring the use of mathematical knowledge and have a sense of belonging to mathematics will benefit from progress in this subject, feel less anxious at Math exam, and experience less restlessness and distress in this regard. The findings of Pahlavan & Kajbaf (2011) indicate the significant and direct impact of Math education process on the attitude towards mathematics and also the significant and direct impact of beliefs and values on the process of learning and attitude towards mathematics. Mousavi (2012) reported that peer tutorship significantly creates a positive attitude towards Math in students, compared with the control.

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Learning English can be considered as one of the important indices for assessing the progress of individuals in the new global society. Despite the efforts made by parents, educators, and authorities in educational centers, the plans and strategies for improving the quality of learning English have been fruitless. Based on the results obtained from previous studies, English is one of the courses that account for the largest academic fall, particularly in high school (Kalantari & Gholami, 2013). According to Mantel Brumli (1995), attitudes influence the teaching and learning of foreign languages and, in fact, they are considered as some kind of emotional and evaluative responses. There is a mutual relationship between the assessment of the benefits of learning English and the attitude towards it. So, those who have positive assessment of learning English will have a positive attitude towards it.

Chi-Jen & Chiu (2014) states that Physics learning is known as the problem of students around the world and improving it is of goals that should be pursued. They also argue that interactive education is effective in improving the learning of Physics. Khazaei & Kamian (2005) showed that there is a significant difference between problem solving method and the traditional method of teaching in terms of academic progress and the impact on educational attitude towards Physics. According to Celis (2013), peer tutorship is an educational method in which peers help each other in learning a subject. Others define it as a way in which peers have enough time to practice and learn more and mutually pave the way for the growth of each other. This method is beneficial for students at risk and parents and teachers who are concerned about school problems. Celis (2013) believes that peer tutorship can provide opportunities for student to practice teamwork and knowledge sharing, but students do not accept excessive expectation of peer teachers and lack of interaction.

MATERIALS AND METHODS

The method of the present study is experimental. Statistical population included all students of the first grade of high school in one of the districts of Tehran (N=149). Among the 6 classes of the first grade, 3 classes were selected and their students were randomly divided into three groups of Math (n=24), Physics (n=25), and English (n=24).

Aiken's Attitude Scale was used for collecting the required data. This scale consists of 24 items based on a 5-point scale from totally agree to totally disagree and measures four emotional processes towards Math, Physics, and English (Sharifi, 1976), including gratification (items 1, 4, 5, 8, 9, 12, 13, 16, 17, 20, 21, and 24), value (items 2, 3, 6, 7, 10, 11, 14, 15, 18, 19, 22, and 23), and evaluation (items 1, 4, 6, 7, 9, 12, 14, 15, 17, 18, 20, 22, and 23). These items are graded reversely from 5 to 1 and the score each subject gives to each item is converted into the range of 20 to 100. Structural validity of this scale has been confirmed by Tyler (1979) (Razaviyeh *et al.*, 2005). To investigate the reliability of the scale, Cronbach's alpha coefficient or internal consistency were used (Sharifi *et al.*, 2010). The coefficient obtained for the whole scale was 0.86 and for each of the items was equal to 0.82-0.89. This indicates a high internal consistency between the scale items.

In the first session of trial, attitude test (pretest) was done, students were grouped, and the top students were chosen and trained.

Program of English group:

- 1- Sessions 2 to 5: Teaching conversation, vocabulary, and grammar and taking an exam on the taught materials by the top students based on the determined policy; asking and solving the mistakes, written exam, and correction of exam sheets and solving the mistakes (7 groups and 7 teacher).
- 2- Sessions 6 and 7: Watching the videos of Magic English and preparing a summary of them in English.
- 3- Sessions 8 and 9: Free discussion and hot seat.
- 4- Session 10: Poster designing in English on an optional subject by Publisher software.

Program of Physics group:

- 1- Session 2: Teaching, asking, solving the mistakes, and written exam on Chapter one.
- 2- Session 3: Asking, solving the mistakes, written exam, and correction of exam sheets and solving the mistakes on Chapter 2.
- 3- Session 4: Teaching Chapter 3.
- 4- Session 5: Teaching the first part of Chapter 4.
- 5- Session 6: Teaching the rest of Chapter 4 and part of Chapter 5.
- 6- Session 7: Reviewing the previous taught chapters.
- 7- Session 8: Teaching the last chapter.
- 8- Sessions 9 and 10: Designing a poster on the game with Physics and its concepts.

Program of Math group:

- 1- Session 2: Teaching Absolute Value, making some rational numbers, radical forms, writing in math language, and factorization.

- 2- Session 3: A review on Absolute Value, making some rational numbers, radical forms, writing in math language, factorization, and additional practices.
- 3- Session 4: A review on the second chapter and correction of mistakes/
- 4- Session 5: Teaching the third chapter; exponentiation (Algebraic expressions).
- 5- Session 6: A review on what taught in the first semester.
- 6- Session 7: Topics related to line.
- 7- Session 8: Two-equation, two-variable system and trigonometric solution.
- 8- Sessions 9 and 10: Designing a poster on the game with Mathematics.

Teaching, asking and correcting the mistakes, written exam, and correction of exam sheets and solving the mistakes were part of all sessions.

In the eleventh session, posttest was performed in all three groups.

All session were held after the school hours led by top students and supervised by the author. After ensuring the ANCOVA assumptions, one-way analysis of covariance and independent t-test were used in order to analyze the data (Rezaei, 2010).

RESULTS AND DISCUSSION

Table 1: Descriptive indices of the effects of peer tutorship on gratification and the value given to Math, Physics, and English in the studied groups

group		Value 1	Value 2	pleasure 1	pleasure 2
Mathematical	Mean	74.7917	70.9722	73.7500	74.2361
	N	24	24	24	24
	Std. Deviation	13.35426	13.76929	15.90468	18.93275
Physics	Mean	54.1333	64.2667	60.9333	70.4667
	N	25	25	25	25
	Std. Deviation	14.11855	18.89959	12.29536	17.80501
English language	Mean	70.6944	76.6667	66.3194	74.9306
	N	24	24	24	24
	Std. Deviation	11.77401	15.44039	19.00915	18.65967
Total	Mean	66.3699	70.5479	66.9178	73.1735
	N	73	73	73	73
	Std. Deviation	15.79758	16.79362	16.57538	18.31262

Table 2: A summary of covariance for the effect of peer tutorship on the value given to Math, Physics, and English with the control of the variable of value in pretest

Source	Type III Sum of Squares	DF	Mean Square	F	Sig.	Partial Eta Squared
Value1	6775.086	1	6775.086	40.156	.001	.368
The effect of peer tutoring	1063.081	2	531.541	3.150	.049	.084
Error	11641.562	69	168.718			

According to Table 2, level of significance of F is 0.049 which is less than alpha-value (0.05). So, it can be concluded that after excluding the impact of pre-test, the peer tutorship method increased the value given to Math, Physics, and English and there is a significant difference between the three studied groups. The effect size of the test is equal to 0.084. A strong relationship can be observed between the scores of pre-intervention and post-intervention in the test of the value given to Math, Physics, and English that its effect size is 0.368.

In order to find that the difference made by which group is more, t-test was done on two independent groups.

Table 3: Descriptive indices of the effects of peer tutorship on the value given to Math, Physics, and English in the studied groups (the difference between the scores of pretest and posttest)

class	N	Mean	Std. Deviation	Std. Error Mean
Physics	25	10.1333	17.07771	3.41554
English language	24	5.9722	11.11986	2.26983

Table 4: T-test on the effect of peer tutorship on the value given to Physics and English in the studied groups (the difference between the scores of pretest and posttest)

Source	t-test for Equality of Means t	DF	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Physics	1.006	47	.319	4.16111	4.13570
English language					

According to Table 3 and Table 4, level of significant for the value given to Physics and English in t-test is equal to 0.319 which is more than 0.05. So, it can be stated that peer tutorship created no significant difference in the value given to Physics and English and these two groups have been equally affected positively by peer tutorship.

Table 5: Descriptive indices of the effects of peer tutorship on the value given to Math and Physics in the studied groups (the difference between the scores of pretest and posttest)

class	N	Mean	Std. Deviation	Std. Error Mean
Mathematical	24	-3.8194	10.54641	2.15278
Physics	25	10.1333	17.07771	3.41554

Table 6: T-test on the effect of peer tutorship on the value given to Math and Physics in the studied groups (the difference between the scores of pretest and posttest)

Source	t-test for Equality of Means				Mean Difference	Std. Error Difference	Error
	t	DF	Sig. (2-tailed)				
Mathematical, Physics	-3.424	47	.001		-13.95278	4.07523	

As it can be observed in Table 5 and Table 6, level of significant for the value given to Math and Physics in t-test is equal to 0.01 which is less than 0.05. So, it can be concluded that peer tutorship caused a significant difference in the value given to Math and Physics and these two groups have been differently affected positively by peer tutorship.

Table 7: Descriptive indices of the effects of peer tutorship on the value given to Math and English in the studied groups (the difference between the scores of pretest and posttest)

class	N	Mean	Std. Deviation	Std. Error Mean
Mathematical	24	-3.8194	10.54641	2.15278
English language	24	5.9722	11.11986	2.26983

Table 8: T-test on the effect of peer tutorship on the value given to Math and English in the studied groups (the difference between the scores of pretest and posttest)

Source	t-test for Equality of Means				
	t	DF	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Mathematical English language	-3.130	46	.003	-9.79167	3.12835

According to Table 7 and Table 8, level of significant for the value given to Math and English in t-test is equal to 0.003 which is less than 0.05. So, it can be stated that peer tutorship caused a significant difference in the value given to Math and English and these two groups have been differently affected positively by peer tutorship.

Table 9: A summary of covariance for the effect of peer tutorship on the gratification of Math, Physics, and English with the control of the variable of gratification in pretest

Source	Type III Sum of Squares	DF	Mean Square	F	Sig.	Partial Eta Squared
pleasure 1	12038.935	1	12038.935	70.266	.000	.505
The effect of peer tutoring	681.861	2	340.930	1.990	.144	.055
Error	11822.056	69	171.334			

The results of Table 1 and Table 9 show that level of significance of F is 0.144 which is more than alpha-value (0.05). Therefore, it can be state that after excluding the impact of pre-test, although an increase can be seen in the mean gratification of groups in posttest, the peer tutorship method caused no significance between the studied groups in the amount of gratification given to Math, Physics, and English. The effect size of the test is equal to 5.5. A strong relationship can be observed between the scores of pre-intervention and post-intervention in the test of the gratification given to Math, Physics, and English that its effect size is 50.5.

Conclusion

The results of the present study are consistent with the findings of Khodadadnejad (2009), Pahlavan & Kajbaf (2011), Sobhaninejad *et al.* (2011), Mousavi (2012), Esmail (2005), Parkinson (2009), Celis (2013), Lee (2014), O'Sullivan (2014), Lin & Chino (2014), Ticknor *et al.* (2014), and Chi-Jen & Chiu (2014). Studies on the positive attitude of female students demonstrate that the subjects keep the positive attitude towards mathematics even until the follow-up stage and for a long time. This approach leads to a sense of empathy and better understanding of education in learners so that they do not view education as a tool. According to the findings of Celis (2013), peer tutoring not only improves writing skill in English but also increases self-confidence of students. The friendly environment that is created in this approach overcomes the sense of insecurity. Celis also found that how students feel comfortable with the attitudes of the peer tutor; the peer teacher does not embarrass them for their mistakes, so they fully pay attention to what he/she says. This method allows learners to become aware of their knowledge and the knowledge of their peers creates an environment of teamwork. The finding of Locke & Chew (2007) indicating that teaching style of the peer tutor and lack of enough knowledge for teaching are weaknesses of this approach is consistent with the result of the present study in Math group. Learning process is strongly influenced by the personality and attitude of the peer tutor and learners acquire even the mistakes of the peer tutor. Findings of Desmet *et al.* (2009) showed that peer tutoring affects the characteristics of a teacher such as self-confidence, self-efficacy, understanding, personal evaluation, and even the negative performance of learners. From the perspective of Ticknor *et al.* (2014), learner prejudice leads to the optional use of educational services by the students at risk, as they do not feel the need for support, while in motivated students, this causes students take advantage of all available resources and facilities in order to achieve success. The findings of the present study suggest that Math teachers have a prominent role in changing the negative attitude of female students towards Mathematics, the programs aimed at changing the attitude towards math, in addition to students, should address teachers and parents in order to provide a more consistent and durable attitude change in students. Hence, it is recommended that in on-the-job training courses for Math teachers and in family education classes, part of the time to be allocated to teaching the method of changing the negative attitude towards mathematics, especially for teachers of female students.

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