Determining the effects of using different writing activities on the academic achievements secondary school 7th grade students and their attitudes towards the course

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The purpose of the study is to determine the effects of using writing activities with different learning purposes by the secondary school 7th grade students on their academic achievement and attitudes towards the course. The study was carried out in a secondary school located in the centre of Erzurum in 2012-2013 academic year; the study is a quasi-experimental with pre-test-post-test design. 97 students from 3 classrooms formed the sampling of the study. These classes were divided into three groups randomly: letter writing, journal writing and control groups. This study was conducted with the 7th grade force and motion subject such as introduction to springs, labour and energy, simple machines, energy and friction force. Before starting the force and motion unit, all the students in the groups took achievement test and attitude pre-test; five-week teaching time was spared for force and motion subject. The participating science teachers taught force unit to all 3 classes by using the same instructional material and pedagogical approaches. Equal time on each task was provided for both groups. Upon completion of final version of the writing assignment post-test was implemented. The analysis of data revealed that journal writing group is more successful than letter writing and control groups. Also letter writing group is more successful than control group statistically. On the other hand, it was found that attitude towards science and technology course did not show a statistically significant difference according to groups.

Key Words: Writing to Learn, writing a Letter, Writing a Diary/journal, Achievement and attitude.

INTRODUCTION

Today, a fierce scientific and technology competition is held between countries. The countries, which regard science courses, are the first in this competition. They revise science teaching in their schools and also make fundamental changes in science teaching curriculum (Çepni and Çil, 2012). The rapid changes in science and technology enhance the need for qualified individuals. Countries make arrangements in science and technology courses in order to raise their individuals in the best way (Cengiz et al., 2012).
In Turkey, science and technology course teaching curriculum was organised according to the constructivist approach, and a student-centred teaching pedagogy was adopted (MEB, 2006). With constructivist approach, it is believed that students could be provided with better learning environments (Elen et al., 2007; Wang, 2011).

In student-centred teaching pedagogy, the role of the teacher and the student is redefined. While the student constructs the new knowledge in the learning process, students review the existing knowledge that had been developed before. Students determine what they know or do not know. During the process of acquiring new knowledge, students maintain learning by observation, experiment, and research. The teacher guides the student through the learning process (Wang, 2011). According to Griffiths et al. (2007), in student-centred learning environment, the students are the active participants of the learning process, and they are the individuals who decide how they learn, construct new knowledge on their preliminary knowledge, and pluck up courage to evaluate themselves.

In student-centred learning environment, different strategies can be deployed to help students learn. Writing to learn is one of these activities. It makes students more active, helps them to think and build new information based on their prior knowledge (Uzoglu, 2012; Yildiz, 2012; Mason and Boscolo, 2000).

The purpose of education and teaching at school is not only to prepare environment to help the students become responsible, but also to reveal and develop their personal skills and materialize intrinsic learning by organising activities suitable to their needs and interests (MEB, 2008). In order to materialize the purpose of education and teaching, writing to learn activities which complement teaching strategies and methods must be used effectively in class environments.

Teachers are required to be aware of potential benefits of writing to learn activities on students’ success. In addition, teachers need to know how to apply these writing strategies effectively in classroom settings by correct pedagogic and teaching methods. However, very little time is spared especially for writing to learn activities in Turkey’s schools’ courses. The main reasons listed are that the teachers perceive writing only as a tool to take notes, and an engagement which causes them to lose time because writing requires spending time individually. Despite these ideas, studies which can be considered as milestone in theoretical meaning adopted writing as learning (Emig, 1977; Klein, 1999; Tynjala, 1998; Hand and Prain, 2002; Gunel et al., 2006). The writing activities in our schools include writing a summary of a book, writing things seen on the board and preparing poster and laboratory reports. Moreover, the different kinds of writing genres can be exemplified as story, letter, brochure, diary, diagram, poem, instructions, explanations or conceptual maps. Writing is necessary to reinforce constructed knowledge. Moreover, many experimental studies conducted in the past support the idea mentioned above and they revealed that writing to learn activities helped the students to gain knowledge better, contributed to the development of the individuals and served different functions (Tynjala, 1998; Hohenshelt et al., 2004; Gunel et al., 2009). Mason and Boscolo (2000) show that students can make more easily conceptual change with writing to learn strategies. The use of writing as a learning tool in science classrooms has begun to receive much attention over the last decade (Gunel et al., 2006). According to Kieft et al. (2006), writing to learn enhances student’s acquisition and understanding of content and knowledge, develops skills of literacy and communication. Rivard and Straw (2000) assert that the students can gain enhancing learning with writing.

In the literature, researchers have determined four basic benefits of writing to learn activities (Hohenshelt et al., 2004). These benefits are listed as follows:

1. Writing to learn enables the conceptual change of individuals. It develops the communication and study skills of the students (Tynjala 1998).
2. It converts the immature thoughts of individuals to more consistent and permanent knowledge (Rivard and Straw, 2000).
3. It enables retention of knowledge for a long time (Rivard and Straw 2000; Klein, 2000) and also helps individuals to reinforce new information.
4. It makes difficult concepts to be learned (Hohenshelt et al., 2004; Gunel et al., 2006; Gunel et al., 2008) by providing an opportunity for the individuals to process the knowledge in their minds (Hand and Prain, 2002).

There is inadequate number of studies in literature, especially in Turkey, about writing to learn activities. The purpose of this study is to fill this gap by investigating students’ success and attitudes with using different writing strategies including letter writing and journal writing. The research questions of the study are:

1. Is there a difference between the pre-test-post-test performances of the students who did letter writing and journal writing activities and the students in the control group?
2. Do the attitudes of the students who did the writing activities towards the course differ from the students in the control group?

METHOD

The research model

The study is a quasi-experimental research and it was conducted with a total of 97 students (7th grade students) and a teacher in a secondary school in Erzurum. It was not possible to assign students to the classes (A, B, and
C) randomly. A quasi experimental method is used in such cases. This method is a design including an experimental approach in which individuals are not randomly assigned to experimental or control groups. In a quasi-experimental method, while the experimental group is interfered with, control group does not receive any interference. At the end of the research, the data obtained from the control and experimental groups are compared (Pektaş et al., 2009). The experimental and control groups are determined randomly by the researcher. In the study, while one of the experimental groups performed letter writing activity and the other experimental group practised journal writing activity, the regular course process was followed with the control group.

**Sampling of the study**

The research was carried out in a secondary school in the centre of Erzurum in 2012-2013 education year. The sampling consisted of experimental group 1 (n=34), experimental group 2 (n=33) and control group (30). There was no difference between the students chosen in the implementing groups with regard to their academic achievement knowledge / achievement and background because the grades of the students belonging to the 7th grade and the 1st term were similar. Moreover, the students came from the socially, economically, and culturally similar environments.

**Data collection tools**

An academic achievement test and an attitude scale for science and technology course were used as data collection tools in the research. Academic achievement test was prepared from the national exam questions such as Level Determination Exam (SBS) by the researcher based on the gains of the unit. The views and suggestions of an assistant professor from the field and two science and technology teachers were taken into consideration in order to provide reliability and validity. According to their views, the number of the questions decreased to 30. Two questions which decreased the reliability were removed from the achievement test which was piloted and academic achievement test was composed of 28 multiple choice questions. The reliability coefficient of academic achievement test was determined to be 0.78.

Attitude scale used for Science and Technology course in the study was developed by Akçay et al. (2003) within the content of the study called “Effect of Computer-assisted Science Teaching on the Student’s Achievement and Attitude” to determine the attitudes and interests of the students towards Science and Technology course. This scale was used in Master’s Thesis titled, “Effect of Brain-based Learning Approach in Science and Technology on the Primary School Student’s Achievement, Attitude, and Level of Keeping in Mind” (Öner, 2007). The scale was made up of 20 attitude statements. Cronbach-Alpha- interior coefficient of the scale was calculated to be 0.89. The scale was developed as 5-point-Likert type and had attitude statements which had the following five options: “Strongly disagree”, “Disagree”, “Undecided”, “Agree”, “Strongly agree”; the students were asked to choose the most suitable option. Scale attitude was implemented with the students in experimental and control group as pre-test-post-test. As a result of Attitude Scale for Science and Technology Course, the minimum point the student can get is 20 and the maximum point is 100. The higher points obtained from the scale reveal that the students had positive attitudes towards Science and Technology course.

**Implementation**

The following topics, *let us get to know springs, work and energy, simple machines, energy and friction force* were used in this study. Before force and movement unit began, the students in all the groups took pre-test; a total of 5 weeks teaching time was spared for force and movement unit. All the classes that participated in the study were taught the movement unit with the same method and techniques. After the unit was completed, letter writing group of the experimental group carried out the letter writing activity which explained the topic to the teacher and the journal writing group carried out the journal writing activity in which they explained what they understood from the topic in their own words beginning from the teaching of the unit. Letter writing group wrote a letter to the teacher explaining the subjects they learned after the unit was finished. This group carried out the writing activities according to the letter writing instructions given to them by the teacher. Journal writing group kept a journal about what they learned in each science and technology course. The students in control class did the end of unit questions. Then, the subject based achievement test given as a pre-test was practised as a post-test. Moreover, attitude scale used in all classes as a pre-test was implemented as a post-test after the study was completed. Table 1 shows the classes in the study, groups and the writing activities carried out.

**Analysis of data**

SPSS 16.0 package program was used to analyse the data obtained from the attitude scale and academic achievement tests. The significance of the differences between the academic achievement and the attitudes scores of the 7th grade students was analised with one way ANOVA and arithmetic mean (X̄). Statistical significance level was set as p < 0.05 for all the tests and
Table 1. The classrooms in the study and the writing activities.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Writing Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Experimental Group-1 (Letter writing)</td>
</tr>
<tr>
<td>B</td>
<td>Experimental Group-2 (Journal writing)</td>
</tr>
<tr>
<td>C</td>
<td>Control Group</td>
</tr>
</tbody>
</table>

Table 2. Pre-test academic achievement point average and standard deviation of the groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>X</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter writing (A)</td>
<td>34</td>
<td>44.56</td>
<td>16.759</td>
</tr>
<tr>
<td>Journal writing (B)</td>
<td>33</td>
<td>43.03</td>
<td>17.719</td>
</tr>
<tr>
<td>Control (C)</td>
<td>30</td>
<td>39.17</td>
<td>11.603</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>42.37</td>
<td>15.714</td>
</tr>
</tbody>
</table>

Comparisons.

Data analysis of academic achievement pre-post tests

Group scores and ANOVA results of the achievement pre-test scores of the secondary 7th grade students according to the methods are given in Tables 2 and 3.

When Table 2 was examined, it was revealed that there was a difference between the group averages and standard deviation. The average of letter writing group is 44.56, its standard deviation is 16.759; journal writing group’s average is 43.03 and its standard deviation is 17.719, and the control group’s average is 39.17 and its standard deviation is 11.603. ANOVA was administered to group data in order to determine whether there was a statistically significant difference between the groups regarding these average differences. The findings are presented in Table 3.

ANOVA was used to determine whether there was a significant difference between the points the groups got from the pre-test. The results of this test are shown in Table 6. Based on the data in this table, there is not a statistically significant difference between the academic achievements of the groups \( F(2,91) = 0.747; p=0.476 \). In addition, ANOVA analysis of the post-test points of the groups reveals that there is not a statistically significant difference between the groups \( F(2,93) = 0.789; p=0.458 \).

DISCUSSION AND CONCLUSION

The aim of this study is to examine the effects of two different writing to learn activities such as letter writing and journal writing on students’ achievement. At the same time, this study tries to determine whether letter writing and journal writing activities have an effect on the attitudes of the students towards the course or not.

Analysis of the results of the post-test which was implemented at the end of force and movement unit and theme-based education revealed that the group performing the journal writing activity was more successful than the group who performed letter writing activity and the control group; and the group who performed the letter writing activity was statistically more successful than the control group. On the other hand, the analysis of post-test attitude points reveals that there is not a statistically significant difference between the groups.
Table 3. ANOVA results of pre-test academic achievement point average according to the method used.

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>485,12</td>
<td>2</td>
<td>242,56</td>
<td>0,982</td>
</tr>
<tr>
<td>Within groups</td>
<td>23219,51</td>
<td>94</td>
<td>247,02</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>23704,63</td>
<td>96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P>.05.

Table 4. Post test academic achievement point averages and the standard deviation of the groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>X</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter writing (A)</td>
<td>33</td>
<td>61,36</td>
<td>18,126</td>
</tr>
<tr>
<td>Journal writing (B)</td>
<td>31</td>
<td>72,90</td>
<td>16,672</td>
</tr>
<tr>
<td>Control (C)</td>
<td>30</td>
<td>51,33</td>
<td>16,914</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>61,97</td>
<td>19,194</td>
</tr>
</tbody>
</table>

Table 5. ANOVA results of the post-test academic achievement scores based on the method used.

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>7111,892</td>
<td>2</td>
<td>3555,946</td>
<td>11,91</td>
<td>.000</td>
</tr>
<tr>
<td>Within groups</td>
<td>27149,013</td>
<td>91</td>
<td>298,341</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34260,904</td>
<td>93</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P<.05.

Table 6. ANOVA Results of the Pre-test and Post-test Attitude Points of the Groups in Science and Technology Course.

<table>
<thead>
<tr>
<th>Pre-test Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>426,845</td>
<td>2</td>
<td>213,423</td>
<td>,747</td>
<td>,476</td>
</tr>
<tr>
<td>Within groups</td>
<td>25986,357</td>
<td>91</td>
<td>285,564</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26413,202</td>
<td>93</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post test Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>471,017</td>
<td>2</td>
<td>235,508</td>
<td>,789</td>
<td>,458</td>
</tr>
<tr>
<td>Within groups</td>
<td>27775,223</td>
<td>93</td>
<td>298,658</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28246,240</td>
<td>95</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P>.05.

2000; Hohenshell et al., 2004; Günel et al., 2006; Günel et al., 2009; Yildiz and Büyükkasap, 2011b; Atila et al. 2010). The use of writing to learn activities in the courses facilitates the conceptual change of the students (Mason and Boscolo, 2000) and promotes their self-esteem (Yildiz and Büyükkasap, 2011; Klein, 1999). As emphasized by Tynjala (1998), writing activity promoted the thinking abilities of the students, helped them reinforce the topics learned and enabled to remember the content concepts (Tynjala, 1998; Hume, 2009). In the light of this study and similar studies, it is thought that using writing to learn activities in teaching process should make positive contributions to students’ learning and enrich this process.

The analysis of data obtained from attitude scale for science and technology course which was implemented with the experimental and control groups revealed that there was not a statistically significant difference between
the groups. The use of writing to learn activities motivates the students to the lesson, enables them to like the lesson, and causes them to develop positive attitudes towards the course (Uzoğlu, 2010). This result shows us that short teaching periods (5 weeks) may not be enough to influence students' attitudes; Aizen (2005) points this issue out and suggests keeping activity times longer to develop a positive students' attitude.

As a result of this study and the other studies conducted on this topic, the use of different writing to learn activities in classroom environment by the teachers such as letter writing, journal writing, will contribute to students in many ways (Hume, 2009). Besides these benefits, writing to learn activities will make positive contributions to the students' learning and develop the students' retrieval, interpretation, reinforcement, and communication skills (Cousin et al., 1999).

**SUGGESTIONS**

The findings of this study and others have revealed that when teachers use different kinds of writing to learn activities in the classroom environment, they provide many benefits to the students. In addition to these benefits, writing to learn activities will make positive contributions to the students' learning and they will also foster their memory, interpretation, reinforcement, and communication skills.

The following suggestions can be made in the light of the findings obtained from this study:

1. Different from those writing to learn activities used in this study, research can be conducted to discover the effects of various type of writing to learn activities (e.g: letter, poem, poster, and short story) on students' achievement.
2. This study was carried out with 7th grade secondary school students. Other studies can be conducted with 7th and 8th grade students and students at high school level.
3. Students' and teachers' views about writing to learn can be determined with a comprehensive qualitative research.
4. This study was conducted with force and motion unit. Similar studies can be carried out with different units.
5. Studies which are similar to this study can be carried out with other courses apart from science and technology course.
6. The effect of writing to learn activities and other methods on students' achievement can be compared.

**Conflict of Interests**

The author(s) have not declared any conflict of interests.

**REFERENCES**


