The Effects of Cooperative Learning and Writing to Learn Applications on Academic Achievement

Emre Yıldız [i]
Atatürk University

Sinan Akdağ [ii]
Atatürk University

Abstract

This study aims to investigate the effect of cooperative story writing and cooperative writing on the academic achievement of prospective social studies teachers in contemporary world history and the relationship between learning writing and course success. The method of the study is a quasi-experimental design with pre-test and post-test comparison groups. The study group of the research is composed of the pre-service social studies teachers who are studying at Atatürk University Kazım Karabekir Education Faculty in the 2019-2020 academic year. The research was carried out with two experimental groups in 6 weeks in total with 12-course hours. Academic achievement test, column, and story writing evaluation rubric were used as data collection tools. According to the data obtained from the pre-test pre-application to the prospective teachers, there was no significant difference between the pre-knowledge levels of the pre-service teachers with whom two different applications were performed. As a result of the study, it was found that cooperative story writing was a significant predictor of academic achievement, but cooperative corner writing was not a significant predictor of academic achievement. Besides, there is no significant difference between prospective teachers' writing skills and story writing skills.

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[i] **Emre Yıldız, Dr.,** Kazım Karabekir Education Faculty, Atatürk University, ORCID: 0000-0001-6396-9183

Correspondence: emre.yildiz@atauni.edu.tr

[ii] **Sinan Akdağ,** Research Assist, Kazım Karabekir Education Faculty, Atatürk University

INTRODUCTION

Today, there are many methods that enable students to learn actively by engaging them in the teaching and learning process in the education system renewed by technology. Among these methods is the cooperative learning model. The cooperative learning model is defined as a teaching strategy in which a small mixed team of students with a common goal supporting one another to improve their understanding of an academic subject and also to help teammates learn in a classroom environment and the team achievement is rewarded in different ways (Delen, 1998; Watson 1992; Johnson & Johnson, (1992). When used effectively, the cooperative learning model provides an opportunity to train students who can explore, question, evaluate, and apply knowledge (Slavin, Chamberlain & Hurley, 2001). Cooperative learning is an in-class teaching method used for problem-solving, critical thinking, developing positive attitudes in students towards themselves and their peers, increasing social skills, and socializing students (Gömleksiz, 1993). The main reason why the cooperative learning model is important in social studies education is that it contributes to students' social development. Moreover, it contributes to some skills included in social studies curricula such as awareness of citizenship, building empathy, and critical thinking. Thus, the cooperative learning model has the characteristics suitable for the learning outcomes of social studies. The different methods of cooperative learning provide broad opportunities for social studies to reach various goals (Şimşek, Örten, Topkaya, & Yılar, 2014). The cooperative learning model has different teaching strategies which change depending on the environmental conditions, the number of students, physical conditions of the class, and course subject (Maloof and White, 2005; Şimşek, Doymuş & Karaçöp, 2008). One of these methods is learning together method.

In this study, writing to learn activities that have many positive effects on learning outcomes were actualized with learning together technique in a cooperative learning model. Writing to learn activities are activities which play an instrumental role in acquiring some higher-order thinking skills such as thinking, problem-solving, analysis, synthesis, and evaluation (Horton & Diaz, 2011). These skills seek answers to the questions such as "Do writing to learn activities cause an effective and permanent learning? Are these activities effective in eliminating misconceptions or incomprehensibility?" (Gere, 1985; Klein, 1999). The origins of writing to learn activities were based on the studies carried out in the 1970s. As a result of the studies carried out in foreign literature by leading names such as Galbraith, Scardamalia, Bereiter, Hayes, and Flower a broad literature was created about writing to learn (Klein & Boscolo, 2016).

Writing to learn activities help to learn a specific concept or subject by using writing skill. This writing activity is mainly described as a learning activity planned according to a rubric (Özturan, 2010). According to the idea suggested by Emig, writing to learn is an activity that helps to change an individual's misconceptions or enables learning new concepts (Emig, 1977; as cited in Uzoğlu, 2010). In a study carried out by Emig, it was detected that writing to learn was different from other components of communication such as speaking, listening, and reading, and revealed that writing to learn was more effective in learning. In another study carried out, Emig divided the components of communication into two: speaking and listening and reading and writing. While listening and speaking skills, the first component of this system, can be done without requiring a planned education, reading and writing skills, the second component of the system, can be applied only by formal and systematic education (Emig, 1977; as cited in Biber, 2012). It is important that writing to learn activities must be suitable for the level. While students perform writing activities, they must know who they are writing to. Because the students know who they are writing to, they have an opportunity to revise what they have learned, thus the learning retention becomes higher. In addition, while students perform writing, knowing who they are writing to contributes to the construction of writing activity by considering the level of the audience (Günel, Uzoğlu & Büyükkasap, 2009). Using writing to learn activities in teaching and learning settings has many benefits. However, the most important duty falls upon the teachers when providing this benefit. It is quite difficult for teachers to know which writing activities will maximize students' achievement and how these activities will be used (Hohensel, Hand & Staker, 2014; as cited in Uzoğlu, 2010). Hence, a model was suggested for the

problems to be encountered while implementing writing to learn activities in a study carried out by Prain & Hand (Prain & Hand, 1996; as cited in Uzoğlu, 2010). The elements included in this model are writing topic, type, purpose, audience, and method of text production. The first thing to do in writing activities is to choose the subject. First of all, the main theme of the subject must be identified and key words must be composed (Bozat, 2014). The second thing is the model of the writing activity. These writing activities generally become varied including story writing, letter writing, and journal writing. After determining which writing activity will be performed considering the subject, the purpose of the writing activity is decided. The purpose of the writing activity could be explaining an idea, making a plan, reminding something known, or inspiring someone about a subject. The next step of the writing activity after specifying its purpose is to determine to whom students will write, that is, the audience must be determined. Students can write to school visitors, their peers, or younger students, and teachers (Uzoğlu, 2010). After choosing the audience, the last element is the method of text production. This method is applied individually or in group works (Bozat, 2014). Students decide how to perform the writing activity with the method of production and perform writing to learn activity considering this decision (Uzoğlu, 2010).

The fundamental purpose of administering educational activities according to the constructivist learning theory is that considering the individual differences between the students, the permanent learning of students with different levels of abilities will be actualized by increasing their participation in learning environments through developing different writing activities (Akçay, Özyurt & Akçay, 2014). In line with this purpose, the researchers suggest that writing techniques that are appropriate to students' levels and develop creativity should be used to actualize permanent learning (Günel, 2009). The studies carried out reveal that individuals who criticize, think, produce, and express what they think freely are needed instead of those who memorize ready knowledge (Çalık & Sezgin, 2005). While training individuals, it is an fact that writing to learn activities, one of the contemporary educational approaches, is of great importance. The implementation of writing to learn activities, which make important contributions to the educational process, in contemporary world history is important because of actualizing permanent learning as the content of contemporary world history consists of quite abstract subjects. This condition shadows the importance of the course and also hinders students' interest and attitudes towards the course.   The lack of interest in the course reduces learning knowledge and retention of learned knowledge. It is considered that the implementation of writing to learn activities will be useful to reduce or eliminate pre-service teachers' reluctant attitudes towards the course.

This study aimed at exploring the effects of cooperative story writing and cooperative column writing on pre-service social studies teachers' academic achievement in contemporary world history and the relationship between writing to learn and course achievement. The research problem was described as follows: "Do the studies of cooperative story writing and cooperative column writing carried out within the context of contemporary world history affect pre-service social studies teachers' academic achievement? and "Is there a significant relationship between writing to learn and course achievement? The research sought to answer the following research questions:

1. Is there a statistically significant difference between the academic achievement of pre-service teachers who performed cooperative story and column writing?

2. Is there a statistically significant difference between the pre-service teachers' story and column writing skills?

3. Is writing to learn a statistically significant predictor of course achievement?

METHOD

A quasi-experimental design with pre-test and post-test comparison groups, one of the experimental designs, was used in the study (McMillan & Schumacher, 2006). The plan of the experimental design was given in Figure 1.
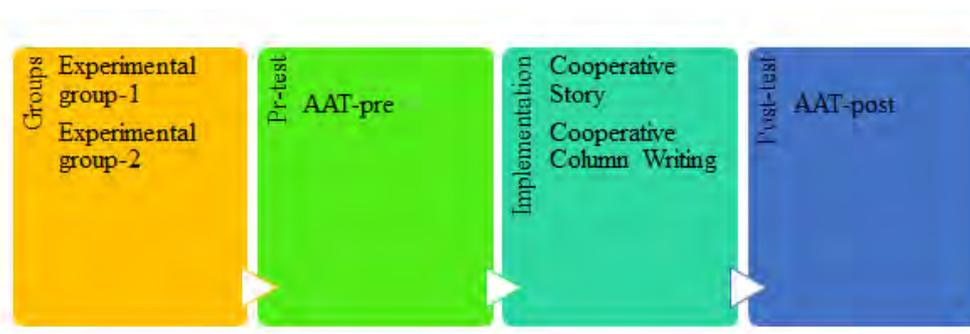

Figure 1. The Experimental Design of the Research

As seen in the experimental plan illustrated in Figure 1, the implementation started with the administration of the Academic Achievement Test (AAT-pre) as a pre-test. While the pre-service teachers in Experimental Group-1 wrote collaborative stories, the pre-service teachers wrote collaborative columns in Experimental Group-2. The implementation ended with the administration of the Academic Achievement Test (AAT-post) as a post-test in both groups.

The Study Group

The research was carried out with 70 pre-service teachers in social studies program -at Atatürk University in the 2018-2019 academic year. While determining the groups, firstly pre-service teacher list was formed, and ballots were prepared. Two groups were formed, and they were called A and B. The names of pre-service teachers for each group were selected by drawing lots. After each lot, the name selected was included in the ballot again and thus an effort was made to equalize the possibility of selection of all pre-service teachers in groups. In this way, when all of the pre-service teachers' assignments to the groups were completed, the names of the groups were written on the ballot and the experimental groups were determined by drawing lots between the groups.

Experimental Group-1 consists of 20 female and 15 male pre-service teachers. Five pre-service teachers' income status range between 0-400 ₺, 18 of them between 500-999 ₺, and 12 of them range from 1000 ₺ and over.

Experimental Group-1 consists of 17 female and 18 male pre-service teachers. Nine pre-service teachers' income status range between 0-499 ₺, 18 of them between 500-999 ₺, and 10 of them range from 1000 ₺ and over.

Data Collection Tools

Academic Achievement Test and column and story writing evaluation rubric were used as data collection tools in the research.

Academic Achievement Test

The test was developed by the researchers to determine the effects of implementation on academic achievement and pre-service teachers' level of prior knowledge regarding application subjects. Because there are no specific gains at the tertiary level, firstly learning domains were

determined and the table of specifications was prepared. 50 questions were developed including all subjects and the questions and the expert evaluation form were sent to three domain experts. The experts examined the questions in many ways including scope, content, and style. As a result, the experts stated that there were no items to be excluded in the test, there were two items that had to be corrected due to assessing more than one property, and stylistic corrections were made and thus the test was finalized. The piloting of the test was actualized with the administration of the test to 180 pre-service teachers who studied the subjects before. As a result of the piloting, the test's KR-20 reliability coefficient was calculated as .83. The test's average difficulty index was .47 and the items' difficulty index ranged between .32 and .71. The items' distinctiveness indexes ranged from .34 to .86. There are 50 items in the test's final version. 2 points are given for the correct answers and 0 is given for the wrong answers and unanswered questions. The minimum score to get from the test is 0 and the maximum score is 100.

Column Writing and Story Evaluation Rubric

Column writing and story evaluation rubric were developed by the researchers to evaluate pre-service teachers' pieces of writing more objectively. The rubrics consist of the criteria including the content of writing, appropriate type of writing, spelling, and grammar, style and genre, audience appropriateness, knowledge richness, and didactic quality. Both rubrics were developed considering a 5-point Likert scale and including 10 criteria. If the criteria are fulfilled, one gets 5 points and if the criteria are not fulfilled, one gets 1 point and thus the criteria are scored on a scale of 1 to 5. The maximum score the groups can get from each writing is 50 points and the minimum score is 10 points. While determining the total writing scores, the mean scores of all writing were taken and the points were converted to 100 -point scale.

Data Analysis

The data obtained were tested whether or not they provided assumptions of parametric tests. The normality values of the data were investigated with skewness -kurtosis coefficients, measures of central tendency, and Shapiro-Wilk normality tests. As a result of the analysis, because it was detected that the data were distributed normally, independent samples t-test was used for the data analysis (Field 2013; Shapiro & Wilk, 1965).

The evaluation of column and story writing was evaluated independently by two researchers. A kappa coefficient of concordance between the two researchers was calculated as .79. This value reveals that there is a good concordance between the two researchers (Landis & Koch, 1977).

Implementation

The implementation was carried out in both experimental groups by the researchers and except for the administration of the tests, the main part of the study lasted 6 weeks (12 course hours). With the administration of the tests, the total implementation time for the study lasted 8 weeks (16 course hours). Learning together model, one of the techniques in cooperative learning, was used in the research. At the beginning of the implementation, the pre-service teachers in both experimental groups were divided into 8 groups consisting of four people and one group consisting of three people considering their prior knowledge, gender, and socio-economic status. During the grouping process, it was paid attention that the groups consisted of individuals with heterogeneous features and a homogenous structure was composed between the groups. When the grouping process was completed, the pre-service teachers were given time to find themselves a group name and logo. This period is important for the beginning of group communication and group discussions and decision-making. When the groups completed their studies, they were given detailed explanations about the cooperative learning process and story and column writing. The pre-requisites for cooperative learning were explained in detail by drawing attention to the differences between cooperative learning studies and

ordinary group works. The pre-service teachers were warned not to make the mistake of dividing the task into pieces and preparing them individually and then combining them. A Preparation and Evaluation Guide for Story and Column Writing was shared with the pre-service teachers. The questions asked by the pre-service teachers about the process were answered and then the implementation stage started. The pre-service teachers were asked to come to the lesson by doing preliminary research individually about the topic of the week. When the pre-service teachers attended the lesson, they took the group order in their determined groups. The study portfolio prepared by the researchers about the subject of the week was distributed to each group. The reason for giving one study portfolio to each group was to provide positive material dependency among the group members. Thus, because all group members used the same material together, their sharing rates were higher. In addition to this study portfolios, the pre-service teachers brought their lesson notes they took during their preliminary research and additional resources to the classroom and thus provided rich knowledge sources. The pre-service teachers were supported to research the subjects using reliable sources on the Internet in necessary cases. The pre-service teachers worked on the portfolio about the subject, they informed their peers about their preliminary preparations, and they had group discussions by asking the subjects in their minds to their group members. While the groups actualized their group work, the researchers walked around between the groups, helped them about the subjects they had question marks in their minds, gave them additional information, and enabled them to have discussions among themselves by asking them questions. The pre-service teachers completed their group work in one lesson hour and they took short notes to use in their writing tasks. The pre-service teachers performed their writing activities every week in the second course hour with their groups similar to the first-course hour. The following subject headings given in Figure 2 were studied in both groups throughout the implementation.

Week-1
- World War I
- Monreo Doctrine
- Soviet Socialist Republics Union and Turkish Communities in Central Asia
- Basmacı Rebellion

Week-2
- The Rise of Japan and Meiji Restoration
- 1929 World Economic Crisis and its Effects on Turkey
- The Efforts to Maintain World Peace before World War I
- The Foundation of Totalitarian Regimes in Europe

Week-3
- The Developments in the World During the Period Between World War I and World War II
- İThe Causes, Development, and Effects of World War II
- United Nations Organization
- Turkey During the World War II

Week-4
- The Foundation of Eatern and Western Blocc
- Truman Doctrine, Marşhall Plan, , NATO Varsaw Pact, , Comecon, Cominform
- European Council,, Schuman Plan, European Coal and Steel Community
- Developments in Eastern Bloc

Week-5
- Developments in Western Bloc
- The Foundation of Israel and Eisenhower Doctrine
- Development of China, Korean War, and Seato
- Independent Struggle in Asia and Africa

Week-6
- Turkish Foreign Policy During the Cold War Period
- Political Developments in Turkey in Cold War Period
- Developments in Science, Culture, and Art in the World During the Cold War Period

Figure 2. Distribution of the Subjects

Story

The pre-service teachers in experimental Group-I wrote a story as a writing to learn activity. A story is a type of writing that differs from a novel and other narrative types with its features that fictionalize real or possible events and situations, being short, with its simple plot pattern, with its few characters and generally conveying a single and intense effect through an important event or scene. Some of the features of the story are given below:

✓ Stories do not have complex plots and many characters.

✓ Because they are not as long-lasting as novels, they can draw the reader instantly.

✓ Stories have a limited number of characters when compared to novels.

✓ The plot is based on real-life in stories. The setting is usually described.

✓ The essential elements of stories are incident, person, place, and time.

✓ Stories focus on one section of life, centers on it, and comments are made concerning world view about the character, incident, and case.

The pre-service teachers were supported and warned about the following points such as transforming the topics into original stories, explaining themselves with original, attractive, and colourful stories which they fictionalized by taking the place of a well-known author and embellishing the subject with a style unique to them. The pre-service teachers were asked to pay attention to the following points given below while writing stories:

- Stories must not oppose the Constitution of the Turkish Republic, insult any beliefs, and go against basic values.

- Stories must be written on A4 size paper and must be a minimum of 3 pages and a maximum of 8 pages.

- They must be written considering Turkish punctuation and spelling rules.

- A clear, sincere, intelligible, and friendly language must be used.

- The story prepared must be developed to teach a subject to a peer.

- Each story must be given an original title according to its subject.

- Stories must raise curiosity and desire in the reader.

- When the subject in the story is presented to a peer, it must be constructed in such a way that he can learn the subject in that course only with the story without requiring any sources.

- The story must be written considering the features of a story.

- Such elements as graphic, figure, table, picture, could be used in stories. However, the writer must not go out of the frame of story writing techniques and examples.

Column Writing

The pre-service teachers in Experimental Group-2 wrote columns, one of the writing types to learn activities. Column writing is a short opinion article published in a newspaper or journal where a writer expresses his own opinion about any subject or daily event in a unique and fine style using a critical thinking point of view, without entering into details and feeling the need to prove it. The pre-service teachers were asked to pay attention to the following points given below while writing a column:

- Columns must not oppose the Constitution of the Turkish Republic, insult any beliefs, and go against basic values.

- Columns must be written on A4 size paper and must be a minimum of 3 pages and a maximum of 8 pages.

- They must be written considering Turkish punctuation and spelling rules.

- A clear, eligible, and objective language must be used.

- A critical point of view must dominate column writing.

- Columns must have an original title according to the subject.

- Columns must raise curiosity and desire in the reader.

- The column prepared must be developed to teach a subject to a peer.

- The peer who reads the column can learn information about the subject from the column without requiring another source.

- Tables, graphics, formula, mathematical expressions, and shapes must be used considering the content of the column and layout.

FINDINGS

Findings of the first research question

The results of the independent samples t-test administered to determine whether or not there was a statistical difference between the pre-service teachers' prior knowledge about the subjects before the implementation were presented in Table-1

Table 3. Independent Samples t-Test Results of the Data Obtained from the AAT-pre-test

Group	N	M	ss	df	t	p
Experimental-1	35	49.26	12.603	68	1.500	.138
Experimental-2	35	44.89	11.757			

As seen from the results of data analysis in Table 1, there is not a statistically significant difference between the prior knowledge of pre-service teachers who performed cooperative story writing and column writing ($t_{(68)}$=1.500, p>.05). The results of independent samples t-test administered at the end of the study to determine the effects of cooperative story writing and column writing on pre-service teachers' academic achievement were presented in Table-2.

Table 2. Independent Samples t-Test Results of the Data Obtained from the AAT-post-test

Group	N	M	ss	df	t	p
Experimental-1	35	74.57	14.047	59.318	3.022	.004
Experimental-2	35	65.94	9.387			

According to the analysis results presented in Table 2, the academic achievement of pre-service teachers who wrote a cooperative story (X=74.57) has a statistically higher significance level than the pre-service teachers who wrote a cooperative column (X=65.94) $(t_{(59.318)}=3.022, p<.05)$. Eta squared effect size value was calculated as .13 and according to the classification of Cohen (1988), this value was considered to have a medium effect. Thus, it can be stated that 13% of the total variance observed with pre-service teachers' academic achievement could have resulted from the studies of cooperative story and column writing.

Findings of the second research question

The analysis results of independent samples t-test administered to determine whether or not there was a statistical difference between the pre-service teachers' story and column writing skills were presented in Table-3.

Table 3. Independent Samples t-Test Results of the Data Obtained from Rubrics

Group	N	M	ss	df	t	p
Experimental-1	35	75.56	12.22	43.887	-0.927	0.359
Experimental-2	35	77.61	4.71			

According to the analysis results presented in Table 3, there was not a statistically significant difference between the pre-service teachers' story and column writing skills $(t_{(43.887)}=-0.927, p>.05)$.

Findings of the third research question

The results of multi-faceted regression analysis carried out to determine the predictive strength of cooperative story writing studies for the pre-service teachers' academic achievement were given in Table 4 and Table 5.

Table 4. The Level of Cooperative Story Writing as a Predictor of Academic Achievement

Model	R	R^2	Corrected R^2	Prediction Std. err Error
1	.516	.266	.244	12.120

Table 5. B and Beta Correlation Coefficients and Significance Levels Belonging to Cooperative Story Writing Studies

Model	Predictor	B	Std. error	β	t	p
1	Writing skill	29.799	13.010	.516	2.291	.029
		.588	.170		3.458	.002

When Tables 4 and 5 were examined, it was revealed that cooperative story writing studies performed by the pre-service teachers were significant predictors of academic achievement (R=0.516, R^2=.266, $F_{(1,33)}=11.959$, p<.05). It can be stated that 26% of the total variance belonging to the pre-service teachers' laboratory achievement was explained by the pre-service teachers' cooperative story writing studies.

The results of multi-faceted regression analysis carried out to determine the predictive strength of cooperative column writing studies for the pre-service teachers' academic achievement were given in Table 6 and Table 7.

Table 6. The Level of Cooperative Column Writing as a Predictor of Academic Achievement

Model	R	R^2	Corrected R^2	Prediction Std.er Error
1	.207	.043	.014	9.322

Table 7. B and Beta Correlation Coefficients and Significance Levels Belonging to Cooperative Column Writing Studies

Model	Predictor	B	Std. error	β	t	p
1	Writing skill	33.981	26.378	.207	1.228	.207
		.412	.339		1.214	.233

When Tables 6 and 7 were examined, it was revealed that cooperative column writing studies performed by the pre-service teachers were not significant predictors of academic achievement ($R=.207$, $R^2=.043$, $F_{(1,33)}=1.473$, $p>.05$).

RESULTS AND DISCUSSION

In the study carried out to explore the effects of cooperative story and cooperative column writing studies on the pre-service social studies teachers' academic achievement in a contemporary world history course and the relationship between the writing to learn and the course achievement, it was determined that there was not a statistically significant difference between the pre-service teachers' prior knowledge.

At the end of the implementation, it was revealed that there was a statistically significant difference between the pre-service teachers' academic achievements in favor of pre-service teachers who wrote cooperative stories. Column writing is more objective, the content can be narrated only with a critical point of view without changing and transforming into a new form; on the other hand, a subjective point of view is dominant in story writing compared to column writing and it is a requirement to change the content into a new form to adapt the content to the story, therefore this causes the pre-service teachers to internalize the subject more. Thus, it can be stated that the higher academic achievements of pre-service teachers were due to writing cooperative stories. Similar results were obtained in the previous studies which examined the effects of writing to learn activities on academic achievement (Akkılık, 2016; Arı & Yıldırım, 2017; Ay, 2018; Aytaş & Uğurel, 2016; Baird, Zelin & Ruggle, 1998; Balgopal & Wallace, 2009; Baltacı, 2013; Çontay, 2012; Davis, 1996; İncirci & Parmaksız, 2016; Karaca, Armağan & Bektaş, 2015; Karaçağıl, 2014; Koçak, 2013; Özyurt, 2011; Rose, Graham & Compton, 2017; Uzun & Alev, 201). Contrary to this study, in a study conducted with pre-service teachers, no significant difference was found between teacher candidates' academic achievements for the General Physics Laboratory III course, where cooperative brochures and cooperative postcard applications were carried out (Yıldız, Koçak, Ürün-Arıcı & Şimşek, 2018). In another study, the achievement of the cooperative poster and cooperative classic report applications for the General Physics Laboratory course was examined, and a significant difference was found in favor of teacher candidates who were applied collaborative poster applications (Koçak, Köksal, Yıldız, Ürün-Arıcı, Seven & Şimşek, 2018). This differentiation between the results of the research studies may be due to the differences in the writing exercises applied, the visuals being at the forefront in the writing activities performed in the laboratory course, and the drawings related to the experiments.

It was revealed that there was not a statistically significant difference between the pre-service teachers' story and column writing skills. Accordingly, it can be said that pre-service teachers achieved a similar level of success in terms of adopting the characteristics of the writing style for

writing stories and columns, presenting the acquired information in accordance with the writing type, and adapting figures, tables, and graphics to the writing type.

It was found that cooperative story writing studies were significant predictors of academic achievement. It can be stated that knowledge transformation into a new form to produce a new story in a cooperative story study enables the pre-service teachers to internalize knowledge more and thus academic achievement increases. Unlike classical writing types, factors such as individuals' absorbing existing information by transforming it into new forms, establishing connections between different information sets, and expressing information freely in their own right can be effective in achieving success (Hand, Prain & Wallace, 2002; Levin & Wagner, 2006).

It was found that cooperative column writing studies were not significant predictors of academic achievement. Because knowledge is used objectively in cooperative column writing studies and knowledge is processed as it is without changing it into a new form, it can be stated that column writing does not make important contributions to increase academic achievement.

The effects of cooperative story and column writing applications on pre-service teachers' achievement in different subjects in different lessons can be investigated. The effects of applying cooperative story and column writing applications in different periods can be examined by changing the application time in the same types of writing. The cooperative learning method and technique applied can be changed by keeping the type of writing. By combining different types of cooperative learning and writing to learn, the effects on the academic achievement of a pre-service teacher can be examined.

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