

EFFECTS OF LAPBOOK USE ON ACADEMIC PERFORMANCE AND ACADEMIC SELF-EFFICACY OF STUDENTS IN SCIENCE CLASSES

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Abstract

Constructivist education programs have been considered an important change in Turkish education system. With this change, new material and techniques have rapidly appeared to achieve learning and teaching and retrieval of knowledge in the long-term. One such material used by teachers in many countries including Turkey is lapbooks. The word lapbook means folded book or handbook. In this study, effects of lapbooks developed by third grade primary school students while studying the unit Journey to the World of Living Things in Science classes on their academic performance and academic self-efficacy were investigated. The study has a quasi-experimental design with a pre-test and a post-test and an unmatched control group. The study sample included all third grade students of a private primary school in İzmir, Turkey. Purposive sampling, a nonprobability sampling method, was used to select the study sample. A pre- and post-test was developed to measure academic performance. The Academic Self-Efficacy Scale, developed by Jinks and Morgan (2003) and adapted to Turkish by Öncü (2012), was utilized to determine academic self-efficacy. Lapbooks were significantly effective in academic performance of the students in Science classes. However, they did not create a significant difference in academic self-efficacy.

Keywords: Lapbook, science, academic performance, academic self-efficacy.

INTRODUCTION

There has been an increase in implementation of new material and techniques so that experience-based learning and teaching and recalling knowledge in the long run can be accomplished. It has been shown that using new teaching material makes learning easy, enhances interest in courses, leads to active learning, provides support for individual learning, allows real life-like learning experiences and improves critical thinking and problem solving skills and creativity (Akamca Özyılmaz, Ellez, & Hamurcu, 2009; Balım, İnel, & Evrekli, 2008; Kabapınar, 2005; Nowak, 2001; Şahbaz, 2004).

One new material utilized by teachers in Turkey and many other countries recently is lapbooks. The word lapbook is a folded book or handbook. Lapbooks have also been called "surprising folder" and "layered book" on the Internet (YouTube). In this study, the term lapbooks has been used. Use of lapbooks is considered as a pedagogical outcome of homeschooling appearing in the USA in 1970's. In addition, the term homeschooling was coined in the work Deschooling Society by Ivan Illich (cited by Cañas & Medina Melcón, 2017). With spread of the term homeschooling in recent years, lapbooks are also considered as part of attempts to help parents' homeschooling their children. Almost all issues of The Old Schoolhouse Journal provide these parents with knowledge, models of educational material and lapbook related practices. Hudson (2016) in an interview with Kimm Bellotto, a practitioner of homeschooling approach, asked the question why lapbooks should be used. Bellotto reported that use of lapbooks allows homeschooling parents to save time and homeschooled children to get rid of boring worksheets. She suggests that lapbooks could be used in all subjects and in all educational steps from preschool age to high school. She thinks that lapbooks are three-dimensional

presentations which demonstrate what students learn. In addition, it has been emphasized that preparing lapbooks helps students gain hands-on experience and that lapbooks are a kind of portfolios about a single unit and can replace ordinary worksheets.

Like Bellotto, Fileccia (2017:38-39) defined lapbooks as a learning tool which allows students to have fun, be creative and learn through a hands-on experience. They can be used in many subjects like Science, History and Mathematics etc., and help students to repeat what they learn and create a file involving their own creative work. Creating this file also improves other skills of students such as manual skills, retrieval of information, revising, summarizing and presenting results of projects. Fileccia (2017) emphasizes that the most important advantage of lapbooks is that children learn by doing and points out that these books improve students' recalling information they have acquired. Similarly, Cañas and Medina Melcón (2017) underlined practices about lapbooks in primary schools in Mexico. They reported that lapbooks were effective in evaluation of learning processes, meaningful learning and students' arranging their own learning. Apart from videos on the Internet offering information about how to create lapbooks, there have not been any scientific studies in Turkey. Since there are few studies (Amaia, 2016; Cañas & Medina Melcón, 2017; Yuli, 2016) and about the issue from other countries and since there was not sufficient empirical evidence in the literature, the present quasi-experimental study was performed to examine effects of lapbook use on academic performance of students in Science classes. Results of this study will provide guidance for further studies in the country and make a contribution to the literature. It is possible to use lapbooks in many subjects. In fact, one can see lapbooks on social media, the website www.handsofachild.com and in *The Old Schoolhouse Journal*. Goodwin (2016) mentioned benefits of lapbooks for Science classes on the website www.thehomeschoolscientist.com and underlines the fact that they can be reproducible and are appropriate for students with different learning styles and different grades. Students can write what they have learned in Science classes, stick pictures and draw figures and tables in their lapbooks. This gives them an opportunity to record and organize information and to learn and remember it through their experiences with their lapbooks. They acquire a lot of information without recognizing that they study and learn. Lapbooks have been reported on the website www.handsofachild.com to be appropriate learning material in preschool, primary and high school education (What is a Lapbook?, 2018).

In recent years some researches have been conducted how lapbook can be used in learning process. For instance, Rukmiatun (2016) has found that Lapbook was effective in teaching reading comprehension of eight grades students. He used pre-experimental design and found that t-test analysis showed that post-test was significant. And he had also measured effect size showed the value 0.169 so the Lapbook had a strong effect in teaching reading comprehension in descriptive text. So he suggested that Lapbook is an appropriate medium to teach reading comprehension in descriptive text. Rickard (2017:15-17) has written a paper about how to use lapbooks to enhancing students interest and engagement in language learning processes. She (2017: 16) emphasized that "Lapbooks that use 3-dimensional, interactive elements to creatively display the products of students' language learning can extend the learning process to the classroom and home, deepening and enriching students' mastery of their learning targets."

Andriievska (2018) has written about the advantages of lapbook technology in formation and developing the information skills of junior pupils in Ukraine. She said that with the lapbook technology the "children will learn to use the knowledge gained practically, to apply creative approach to the process of securing knowledge" (2018:59). Peycheva and Lazarova (2018: 959-960) in their paper had discussed about the usage of Lapbook in Primary level. They described lapbook as "a small folding information book that collects all the materials under a certain topic". A lapbook may be used for a lot of ways: such as learning, presenting results, private study and also for generalizing and systematizing students' knowledge and skills on a particular topic. And they (2018: 963) said that "The lapbook is a suitable form for the age of primary school level students to present facts, events, and ideas from the surrounding world." In their final words they also emphasized that the lapbook value is more multiplied with making students by their selves. Because they will learn the content, create an aesthetic folder, to form and develop some skills etc.

Vejmélková (2018) found that Lapbook is beneficial for the purpose of teaching English to very young and young learners. For her bachelor thesis she made a research with a class of ten – five to seven-year-old learners of English language. She had used lap-books and created them with the students and found that when work with the Lapbook begins, the attention of the learners grows. And she also saw that the teaching material is stimulative enough for very young learners. She emphasized that the usage of Lapbook has a positive impact on the attention of a pupil during an English lesson and Lapbook is suitable for incorporation of all Gardner's eight intelligences.

Jamaudin, Rosidah, and Nurbaiti (2020) had made a research of the usage of lapbook on the ability of critical thinking and student learning outcomes. And they found that the use of lapbook media manage to improve the outcomes mentioned above. Halimah, Marwati, and Abdillah (2020) has done a research on fostering students' creativity through lapbooks. They have studied with the fifth grade students at an Indonesian school and used the lapbooks as an assessment technique in Project-based learning activity. At the end of the process they reached the results that the lapbook-based portfolio project, the students could create an appropriate learning environment which challenged their creativity. And they also emphasize that "The students were found in the creative category because they were able to document their learning and to explore to create interesting and artistic lapbooks (2020: 2976)."

Manukyan and Piloyan (2020) have done a research with the primary school children. They have hearing impairments and in the study 4 hearing-impaired pupils (2 boys, 2 girls) were participate. They were going an inclusive school and they created their own lapbooks during the research process. The researchers emphasized that "preparing lessons with a lapbook, as well as the process of creating a lapbook, definitely has an incredible impact on the development of cognitive activity in primary school students with hearing impairments" (Manukyan & Piloyan, 2020: 69). The results given above shows us usage of Lapbook around the world emphasized that it can be used as an effective tool for learning process.

Literature Review

Kablan, Topan, and Erkan (2013:1629) made a meta-analysis of 57 studies about effects of material use during learning processes on academic success in Turkey and reported that it has the strongest effect on learning science. It has also been emphasized in the science curriculum of Turkish Ministry of Education that active involvement of students in learning activities and use of tools and material are of importance (MONE, 2017:11-12). It is also recommended in the curriculum that students should be provided with learning environments in which they can express their opinions in written, oral and visual ways and improve their communication and creative thinking skills. It is thought that lapbooks will support students in terms of the abovementioned skills.

Many studies have suggested that appropriate teaching methods and techniques should be selected so that expected academic performance in Science classes can be achieved. Especially results of the studies revealing effects of new approaches such as problem-based learning, collaborative learning, concept cartoons, drama and predict-observe-explain (POE) etc. are striking (Akamca Özyılmaz & Hamurcu, 2009; Akamca Özyılmaz, Ellez, & Hamurcu, 2009; Balım, İnel, & Evrekli, 2008; Bilgin, 2006; Kabapınar, 2005; Nowak, 2001; Şahbaz, 2004; Şahbaz & Hamurcu, 2012). In the present study, effectiveness of a new learning tool, i.e. lapbooks, has been investigated.

Turkish students' academic performance is an issue which should be monitored closely when educational resources and needs for specialist workforce in the country are taken into account. Among the factors affecting students' academic performance are readiness, motivation, self-efficacy, arrangement of learning environments and teaching tools and material etc. In the present study, effects of lapbooks on academic performance and academic self-efficacy have been dealt with. Since the present study had a quasi-experimental design and was the first about lapbooks, effects of the learning tool on only two variables were examined. Further studies can focus on other variables.

Self-efficacy refers to self-confidence and beliefs developing through experiences over time (Cantürk Günhan & Başer, 2007). Bandura (1986) defines self-efficacy beliefs as judgements concerning

individuals' ability to arrange and fulfill what needs to be done for performance of an act (cited by Şenler, 2017). Therefore, self-efficacy beliefs are thought to be one of the key factors of effective teaching and learning. In general, individuals with higher self-efficacy are likely to overcome difficulties more easily. Regarding learning, academic self-efficacy becomes of importance. It refers to students' beliefs that they can complete academic tasks successfully (Zimmermann, 1995) or can be successful in their fields of study (Bandura, 1997). There have been several studies about self-efficacy of teachers and pre-service teachers teaching various subjects (Altunçekiç, Yaman, & Koray, 2005; Arseven, Arseven, & Tepehan, 2015; Ekici, 2008; İkinci Vural & Hamurcu, 2008; Hamurcu, 2006; Özbilen, Canbulat, & Çekiç, 2020). Many studies about self-efficacy of primary school students have been performed as well. Çetin (2009) examined self-efficacy of primary school students in the education program they were offered. Özyürek (2005) investigated self-efficacy of high school students in Mathematics classes. Çetin (2013) also investigated whether self-efficacy scores of the fourth grade and fifth grade primary school students were predictive of their academic performance in some classes (Mathematics, Turkish Language and Social Sciences etc.). Likewise, Akay and Er (2017) in their study on fourth grade primary school students found that practices based on Dick and Carey's teaching model were effective in self-efficacy of the students in Mathematics classes. Aydoğan, Bardakçı, Arslan, Civelek, and İşyar (2016) examined the fourth grade and fifth grade students' attitudes to and self-efficacy levels in Physical Education classes and could not find a significant difference in self-efficacy levels between the fourth grade and fifth grade students. Canbulat, Cipevezici, Kalfa, and Fahliogulları (2017:105-123) dealt with commitment of primary school students to school and their academic self-efficacy levels and found a significant difference in commitment to school and academic self-efficacy levels in favor of female fourth grade students. In addition, they reported a significant difference in academic self-efficacy levels in favor of the students having received pre-school education. Since it was assumed that students with high academic self-efficacy could consider themselves as more competent in completion of their lapbooks and could fulfill responsibilities given to them, the present study was directed towards examining effects of a learning tool on academic performance and self-efficacy of the students. Many other studies have been performed on secondary school students, and relations between self-efficacy levels and several variables have been examined (Arslan, 2012; Doğan, Beyaztaş & Koçak, 2012; Gülten Çağırğan & Soytürk, 2013; Koç & Arslan, 2017; Yılmaz, Yiğit, & Kaşarcı, 2012).

It has been shown in the literature that academic self-efficacy is effective in some variables including success, attitudes and communication skills. Therefore, this study was directed towards determining effects of lapbooks not only on academic performance but also on academic self-efficacy levels. There is limited research on this issue in Turkey.

Research Questions

The main research question was whether lapbooks created by third grade students about the unit Journey to the World of Living Things in Science classes had an effect on academic performance and academic self-efficacy of the students. The following sub questions were dealt with to find an answer to this research problem.

Sub questions

- 1- Is there a significant difference in scores for the achievement test administered to determine academic performance in science classes between the experimental and the control groups?
- 2- Is there a significant difference between the pre-test and the post-test scores for academic performance between the experimental and the control groups?
- 3- Is there a significant difference in scores for the academic gain in science classes between the experimental and the control groups?
- 4- Is there a significant difference between pre-test and post-test scores for academic self-efficacy in the experimental and the control groups?

METHODS

The study has a quasi-experimental design with an unmatched control group. Karasar (2006:102) has stated that this design is similar to the one with a control group and pre - and posttests. The difference between them is that study groups are determined randomly in an experimental design, but that no special effort is made to match the groups through random assignment in a quasi-experimental design. The study sample included third grade students of a private primary school in İzmir, Turkey. There were two classes of third grade students. The researchers assigned one class into the experimental group and the other into the control group. The experimental group were made to create a lapbook and the control group was exposed to activities conducted according to the available Science curriculum, which was implemented in all schools in Turkey. A pre-test and post-test for the unit Journey to the World of Living Things developed by the researchers was administered at the beginning and at the end of the study. The reason of selection of the unit World of Living Things was the timing of the curriculum. Similarly, The Academic Self-Efficacy Scale (Öncü, 2012) was administered at the beginning and at the end of the study.

Sample

The study sample included all third grade students of a private primary school in İzmir. A purposive sampling was used to select the sample. The class taught by the teacher voluntarily accepting to implement the lapbook intervention was assigned into the experimental group. There were 17 students in the experimental group (10 boys and 7 girls) and 18 students in the control group (10 boys and 8 girls). Two different teacher taught the classes during the process. Parents and the school administration had been informed about the study. It has been ensured that the professional experience and training of the practitioner teachers are similar.

Measurement Tools

Pre-test and Post-test: A pre-test and post-test test composed of 17 questions was developed to measure academic performance. First, the researchers prepared three questions for each of six gains in the unit Journey to the World of Living Things about which the students would create a lapbook (18 questions in total). Second, a Science teacher and five experts working at a university (science and measurement and evaluation specialists) were requested to offer their opinions about content validity and suitability of the questions. In accordance with their opinions, the questions were revised and a test was created. Then, the test was administered to 93 fourth grade students from different schools. The reason why it was administered to fourth grade students was that they had already learned about the unit Journey to the World of Living Things. The scores were recorded and Kuder Richardson-21 (KR-21) was calculated to determine whether the test was reliable. One question which was very difficult and not operational was deleted. The final version of the test was composed of 17 questions and its KR-21 score was found to be .72. And this result showed that the test were reliable. The lowest and the highest scores for the test are one and 17 respectively.

Final points of Science Lesson: The students' fall semester science lesson grades were used to determine the equivalence of the groups.

The Academic Self-Efficacy Scale: The Academic Self-Efficacy Scale, developed by Jinks and Morgan (2003) and adapted to Turkish by Öncü (2012), was used to determine academic self-efficacy. It is a four-point Likert scale and has 21 items, none of which are negative statements.

Scores for the scale range from 21 to 84. Exploratory factor analysis showed that the scale had one factor, responsible for 43.12% of variance. Confirmatory factor analysis revealed that the factor structure of the scale had a good fit for real data. Its Cronbach's alpha was reported to be .80. In the present study, it was found to be .77. Özdamar (1997: 500) reported that scales with Cronbach's alpha ranging between .60 and .80 are reliable and that scales with Cronbach's alpha ranging between .80 and 1.00 have a high reliability. Cronbach's alpha values of the Academic Self-Efficacy Test showed that the scale was reliable.

Intervention

The unit Journey to Living Things in Science classes for third grade students is covered in 18 hours for six weeks. In the control group, classes were conducted based on Science curriculum of the academic year 2017. The experimental group was divided into four groups and each group was made to create their lapbook while they were exposed to classes based on the Science curriculum of the academic year 2017. The students spent two hours a week and a total of ten hours to create their lapbooks. In that time the students were observed by the researchers. The remaining eight hours were spent on presentation of theoretical knowledge in accordance with the curriculum. It took a total of 18 hours to cover the unit in both the experimental and control groups. Examples for implementation have given in pictures 1 and 2.



Picture 1: Natural and unnatural environment



Picture 2: Unnatural environment

Data Analysis

Scores for the pre-test and post-test and the Academic Self-Efficacy Scale were analyzed with SPSS 21. Whether data were normally distributed was tested before the analysis. Tabachnick and Fidell (1996) recommended that Shapiro-Wilk test should be used to test normality of data when a sample size is smaller than 50. When the test result shows $p > .05$, scores are considered as normally distributed. In addition, Büyüköztürk (2017) reported that Skewness and Kurtosis coefficients should be between -1 and +1 so that given data are normally distributed. In the present study, the normality analysis showed that data obtained through the pre- and post-test and The Academic Self-Efficacy Scale had normal distributions (Shapiro-Wilk Results; p : science pre-test= .40, science post-test= .20, self-efficacy pre-test= .36, self-efficacy post-test= .71. Kurtosis and Skewness are between -1, and 1). Therefore, the data were analyzed with a parametric test, t test for independent groups. The statistical significance was set at $p < .05$.

RESULTS

The findings has been discussed in the framework of the sub questions.

The first two sub questions has been dealt together due to the scores for the final points of Science Lesson given in the fall term to both the experimental and control groups selected by the researchers through purposive sampling to determine whether they were similar in their academic performance.

As seen in Table 1, there was a significant difference in the achievement test scores between the groups ($p < .05$). However, the intervention was continued since the groups were determined long ago.

Table 1. Results of the t test concerning academic performance scores for Science classes in the experimental and control groups

Scores for academic performance in Science	Group	N	Mean	SS	df	t	P
Final points of Science Lesson (Fall Term)	Control	18	95.30	9.62	33	2.87	.00*
	Experimental	17	85.00	11.48			
Pre-test	Control	18	13.16	1.85	33	2.73	.01*
	Experimental	17	11.11	2.54			
Post-test	Control	18	14.05	1.79	33	0.42	.67
	Experimental	17	13.76	2.25			

* $p < .05$ was considered as significant.

As shown in Table 1, the significant difference in the final points of Science Lesson scores between the groups also appeared in the pretest scores ($p = .01$ and so $p < .05$). Based on the mean values, the difference was found to be in favor of the control group. There was not a significant difference in the posttest scores between the groups. However, due to the difference in the pretest scores, the researchers thought it would be better to compare academic gain of the groups to reveal effects of lapbooks on academic performance of the students in Science classes.

The third subquestion has been dealt about the academic gain of groups. Academic gain is defined in the literature as a difference between input and output consistent with goals of an educational program (Demirel, 2002:314). Comparisons of scores for academic performance between groups exposed to different learning activities are frequently made. They allow determining academic gain of students over time. The difference between the pretest scores and the posttest scores was considered as the score for gain and t test was carried out. Results of the test are presented in Table 2.

Table 2. Results of t test concerning scores for academic gain in Science classes in the experimental and control groups

Variables	Groups	N	Mean Difference	SS	df	t	p
Scores for Academic Gain	Control	18	.88	1.75	33	-2.66	.01*
	Experimental	17	2.64	2.14			

* $p < .05$ was considered significant.

As shown in Table 2, the difference between the mean pretest scores and the mean posttest scores was 0.88 in the control group and 2.64 in the experimental group. It can be suggested that the experimental group had higher academic gain than the control group. T test performed to determine whether this difference was significant showed that the difference in newly acquired knowledge was significant in favor of the experimental group ($p < .05$). This finding means that although the control group had significantly higher scores for the achievement test and the pre-test, the experimental group had a significantly higher scores for the post-test. It seems that academic performance of the experimental group in Science classes, exposed to the lapbook intervention, increased.

The last subquestion of the study was directed towards determining whether academic self-efficacy of the students was affected by the lapbook intervention. Obtained findings about academic self-efficacy are shown in Table 3.

Table 3. Results of t test concerning academic self-efficacy scores in the experimental and control groups

Academic self-efficacy	Groups	N	Mean	SS	Sd	t value	p
Pre-test	Control	18	65.00	3.61	33	-.96	.34
	Experimental	17	67.52	10.55			
Post-test	Control	18	65.66	7.42	33	-.71	.47
	Experimental	17	67.76	9.77			

As presented in Table 3, there was not a significant difference in academic self-efficacy scores between the pre-test and the post-test in the experimental and control groups. Both groups got very close mean academic self-efficacy scores for both the pretest and the posttest. Both of them received quite high scores for the academic self-efficacy Scale, for which students can get the highest score of 84. It can be suggested that teaching-learning activities did not create a significant difference in academic self-efficacy in both groups although they produced a small improvement. It may be that the study was performed in a private school and that there was a small number of students in the sample.

DISCUSSION and CONCLUSIONS

In the present study, effects of a lapbook intervention performed in Science classes on academic performance and academic self-efficacy in third grade primary school students were examined. The findings showed that the lapbook intervention was significantly effective in academic performance of the students in Science classes. However, no significant difference appeared in academic self-efficacy of the students. These findings seem to support the evidence in the literature that lapbooks make learning fun and what is learned permanent and enhance cooperation, reciprocal help, respect, self-respect, note taking skills and team work (Amaia, 2016; Cañas & Medina Melcón, 2017; Judean Pratt, 2005; Yuli, 2016). Due to lack of similar studies about teaching Science in Turkey, it is not possible to discuss and comment on the findings of the present study in light of the relevant literature from Turkey. But for the recent studies from world our results had been supported by them. Rukmiatun (2016) had showed that the usage of Lapbooks in teaching reading comprehension found to be an effective tool for the eight graders'. Also Vejmělková (2018) found that for the very young learners a Lapbook may be an effective tool in English teaching. Similar results have been found in different areas and student groups by Rickard, 2017; Andrijevská, 2018; Peycheva & Lazarova, 2018; Halimah, Marwati & Abdillah, 2020; Jamaludin, Rosidah & Nurbaiti, 2020; Manukyan & Piloyan, 2020; etc. But because of these researches were not same as ours- not in science area or in primary education- the results did not discussed here. But these results had showed that, there were a lot of researches were being done around the world about using Lapbooks in learning process. So our research can be accept a starting point for similar researches will be done in Turkey.

In the current study, the lapbook intervention did not create a significant effect on academic self-efficacy. In the relevant literature on primary school students, the studies have usually been directed towards determining self-efficacy levels in such courses as Mathematics, Social Sciences and Physical Education, and commitment to school (Akay & Er, 2017; Aydoğan, Bardakçı, Arslan, Civelek, & İşyar, 2016; Canbulat, Cipevizci, Kalfa, & Fahlioğulları, 2017; Çetin, 2013). In these studies, to what extent self-efficacy was predictive of academic success in courses and effects of gender on self-efficacy were dealt with. Akay and Er (2017) reported that teaching material they created had a positive effect on self-efficacy in Mathematics and Çetin (2013) found self-efficacy to be predictive of academic performance in some courses. Aydoğan et al. revealed no significant difference in self-efficacy in Physical Education classes between fourth grade and fifth grade students (Aydoğan et al.

2016). Canbulat et al. (2017) revealed a significant difference in commitment to school and academic self-efficacy in favor of female students. The results of the present study could not be compared with those of the abovementioned studies since the present study focused on effects of a lapbook intervention in academic performance and academic self-efficacy in Science classes and since it did not involve gender differences. As there have been no studies about lapbook interventions in Turkey and as the present study was directed towards testing effectiveness of a material based on constructivism, its results are important and will make contributions to the relevant literature.

There is evidence in the relevant literature that lapbooks can be used in both learning and evaluation (creating a portfolio/folder). A lapbook to be prepared at the end of a term can be used as a convenient evaluation tool to show to what attention has been paid during learning processes. Thanks to this feature of lapbooks, they can be considered and utilized as an authentic measurement and evaluation tool, which was also suggested by results of a study by Judean Pratt (2005).

For the end note; the limitations of the study were the research have been done only for one unit and one school in a very short period of time- about 6 weeks-. Because it was the first application as an academic research on lapbook implementation as a learning tool in Turkey –as far as the researchers’ can reached- it may be acceptable. In the research only two results were examined by the researchers’ academic gain and self-efficacy because of the group and the time shortness. In future more effects of lapbook interventions can be examined.

Suggestions

One limitation of this study was that the students created a lapbook only for one unit and that effects of this intervention on academic performance and academic self-efficacy were examined for very short time as mentioned above. Therefore, further studies lasting for longer time should be performed to examine effects of this intervention on different variables including retrieval of information longer time after the intervention.

In the study, the research has been done in one private primary school, in further studies the sampling may be chosen from different schools. And more classes can be investigated in the study.

In the present study, lapbooks were used in Science classes. In further studies, they might be utilized in different courses like Turkish Language, Mathematics and History etc.

Taking account of the idea that lapbooks are effective in improvement of many skills of students (e.g. creativity and higher order thinking skills), it can be recommended that primary school teachers might be provided in-service training for lapbooks.

It can also be suggested that effects of lapbooks on such variables as creativity, self-respect and cooperation might be determined in further studies. And also qualitative experimental models such as interviews, action researches, and case studies can be done.

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