



The Effect of the 5E Learning Cycle Model and Cooperative Learning Method in the Constructivist Approach on Academic Success and Students' Attitude towards Subject of "Sound"

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Authors' contributions

This work was carried out in collaboration between all authors. Author ST designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors SS and ST managed the analyses of the study. Author HC managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The aim of this study is to find out the effect of co-operative learning and 5E Learning Cycle Model towards academic success and attitude in teaching 8th grade students in science and technology lesson. The study was carried out on 95 8th grade students of a government school in 2008-2009 educational term. Students were divided into three groups as an experimental groups of 5E learning method, cooperative learning method and comparisional group of the traditional learning method. Science and Technology Success Test and Attitude Test were applied to the each group as pre-test and post-test as an assessment tool and the results were analysed by SPSS software. At the end of the research, it was seen that there is no meaningful differences between 5E Learning Cycle Method and Cooperative Learning Method towards academic success but there is a meaningful difference between the each method as given above and traditional method. It was observed that the students were more successful in the lessons executed with constructivist approach but there was no meaningful differences in the students' attitudes towards the lessons.

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1. INTRODUCTION

Societies are expecting from the growing individuals to adapt to the society, cultures, social values, preserve and improve them. To make this come true societies benefit from the fact called "education". Today our society is processing quick transformation at the same with the world, and in this process the need of qualified people appeared clearly. Society demands from education system to train thinking, producing, creative, communicative, environmentally and socially sensitive individuals that are able to watch and adapt up to date developments instead of rote and normative (Aksu [1]). For this reason main purpose of this kind of an education system, should be teach how to discover information rather than transfer the existing information. Science and Technology lesson is one of the most effective lesson to get this qualities.

The purpose of the Science and Technology lesson is raise thinking, investigating, examining and working individuals. In this lesson selection of the method and techniques should be according to this purpose. To raise individuals in parallel with this purpose experiments, observations, examinations and problem-solving should be the key point. With the help of this course students gain the habit of objective thinking and making the right decisions in the events and situations by examining scientific method (Akgün [2]).

As looked out to the programs of this course, you will notice the inadequacy in carrying out the purposes of science education with the teacher-centered approaches. On that note, there is need for new approaches aiming to reveal creativeness of students, provides them to use scientific processive skills, logical and high-level thinking abilities. According to this new approach students should prefer learning by searching various sources, exploring, using problem-solving skills and showing positive attitude against the subject to getting the information from teacher and memorize them. In this context many student centered teaching methods and approaches are identified in which individuals configure information themselves in a meaningful way stressing the importance of learning by doing. One of these approaches is constructivist approach (Acat and Ekinci [3]).

Mental constructions which will be learned in constructivist approach are carried out especially by individuals. For this reason, constructivist educational settings enable individuals to interact with the surrounding much more. Owing to this kind of educational setting, students have the chance to prove the correctness of informations formerly constructed, correct the mistakes and replace former informations. In the settings of approach, students are generally benefited from many kinds of methods and techniques like brainstorming, learning by discovery, problem-based learning, cooperative learning and 5E Learning Cycle Model (Engage-Explore-Explain-Elaborate-Evaluate) which provide them to be more active and get more responsibility in learning process.

5E Learning Cycle Model, which is carried out in 5 steps and cooperative learning method which enables students to learn by helping each other's learning in accordance with this purpose are the two most widely acknowledged method in teaching courses even if there are various practices in constructivist educational programs.

1.1 5E Learning Cycle Model based on Constructivist Approach

Established on principles of constructivist method, 5E Learning Cycle Model puts together specific features of learning methods. It claims that one is not empty-minded while eliciting the knowledge, activates the mind structures related with recently learned subjects and concepts, tends to study the matters relatable to one's self and reconstructs new knowledge actively in mind (Saka [4]).

In so-called 5E Learning Cycle Model, every "E" represents different stages (Turgut, et al. [5]; Smerdan and Burkam [6]; Çepni et al. [7]; Eisenkraft [8]).

- 1- Engage
- 2- Explore
- 3- Explain
- 4- Elaborate
- 4- Evaluate

It's vital not to change the order of any steps in terms of main sense of learning approaches.

1.2 Cooperative Learning Method Based on Constructivist Approach

According to Açıkgöz [9], cooperative learning method is student's studying by helping each other in small groups for a common purpose. Yıldız [10] defines cooperative learning as students' with various capacities, races, and social skills doing the learning by helping each other in small groups for this common purpose. The most specific characteristic of cooperative learning is students' studying by helping each other in small groups. In this method students try to maximize both their and the others' learnings.

1.3 Literature review of 5E Learning Cycle Model and Cooperative Learning Method Based on Constructivist Approach

Many researchers have studied on the influence of improvement and variation of 5E Learning Cycle Model and Cooperative Learning Model in social skills observed in the students within this study, student manner, academic success. Some of these are given as below.

Gillies [11] made a research on the forming of this cooperative group works in classes and researched the effects of small group learning on students' communication skills, learning and behaviour in his study. At the end of the research, it is determined that students will achieve greater success and motivation with cooperative method than working alone, and importance of forming cooperative groupworks clearly appeared. Çalışkan et al. [12] examined the influences cooperative learning and traditional teaching methods on university level physics laboratory success and attitude in his studies. At the result of the researches he figured out there is difference in physical laboratory success between cooperative learning group and traditional learning teaching group's but there is no significant difference between in their attitudes towards the laboratory. Şimşek et al. [13] studied the effect of cooperative learning to the manner and success of the students who lives in countryside. As a result, he positively proved cooperative learning to effect both their academic success and attitudes according to the traditional methods. Genç and Şahin [14] investigated the effect of cooperative learning method to the students' academic success and attitudes in the Science and Technology lesson. Before and after the practice both group did

Science lesson success test and attitude test. According to the acquired data, success of experiment group rised more than control group and meaningful difference was seen in the both group's attitude score towards Science lesson after 4 months of practice. Kılınç Alpat et al. [15] wanted to determine the effect of cooperative learning on the academic achievement and the views of the secondary school students about Nanotechnology subject. At the end of the study they found out that there was a significant difference in favor of the experimental group according to the post-test academic achievement scores of the control and experimental group students. Furthermore interview results showed that the experimental group students had better positive opinions than the control group, and also the control group students had negative attitudes such as lack of practice, boring and ineffectiveness of the course. Eymur and Geban [16] in their work investigated the effects of cooperative learning based on conceptual change approach instruction on seventy-two ninth-grade students' understanding in chemical bonding concepts compared to traditional instruction. After practice the results from ANCOVA showed that cooperative learning based on conceptual change approach instruction led to better acquisition of scientific conceptions related to chemical bonding concepts than traditional instruction. And interview results of the students indicated that this practice helped students' learning and increased their learning motivation and their social skills.

As we analysed the literature reviews above, we noticed that cooperative learning is more effective on the students' academic successes than traditional method. In addition to this, all studies except one of them support that cooperative learning method influences the students' attitudes towards subjects positively.

Kılavuz [17] compared the influence of 5E Learning Cycle Model based on a constructivist method on the understandings of 10th grade students to the subject of acid and base by traditional model and researched the effect of the method towards the student attitudes. Consequently it is seen that students' attitudes of two groups towards chemistry improved equally and this model is more effective in understanding the concepts related with this subject. Bozdoğan and Altunçekiç [18] in their work called "Opinions of the Science teacher candidates on the availability of 5E Learning Cycle Model", survey

data were collected from students' answers to the open-ended questions about the issue. According to teacher candidates, there are lots of positive sides of the model but there are also some difficulties in practising this learning model such as lack of equipment and time, overcrowded classrooms and teachers' lack of information.

Hırça [19] in his work named "Examining of the effect of the materials developed about the issue of "Work, Power and Energy" depending on 5E Learning Cycle Model to the Conceptual Change", he noticed constructivist approach is more efficient than traditional approach in understanding the concepts related with this issue. Aktaş [20] finds out that there is a meaningful difference on the side of constructivist approach between 5E learning model and cooperative learning method and traditional method in his study named "The research of the effect of the usage of 5E learning method to success and attitude to Biology lesson". Bıyıklı and Yağcı [21] discovers that there is a meaningful difference between control group which is in accordant with available curriculum and experiment group which is in accordant with 5E learning method on behalf of experiment group in terms of scientific process skills in their study called "The effect of educational situations formed according to 5E learning method to the Scientific Skills." Zengin [22], concluded that 5E model based on constructivist approach has higher achievement average than traditional method in his study called "The influence of 5E learning method to the students' success in 8th grades segmentation subject.

Along with this, the studies above shows us that 5E learning method is more effective than traditional method in terms of knowledge permanence, mostly for students' attitudes. But of course this method has some failings. The current negative situations of the classrooms and teachers ability are very important for the efficiency of the practice.

The aim of this study is to compare the practicality of this two methods, to determine students' view related to subject and to find out effects teaching "sound" subject in 8th graders by using 5E learning model and cooperative learning approach to their successes and attitudes towards lesson. As to our study, we observed that students were more successful academically in the lessons but there was no

meaningful differences in the students' attitudes. However the reviews about cooperative learning are in a positive way.

2. METHODS

As data collection tools, "The Success Test (BT) of Science and Technology Lesson", before The Attitude Scale (TÖ) of Science and Technology Lesson", "Opinion Scale of 5E Learning Cycle Model" and "Opinion Scale of Cooperative Learning Method" were employed.

BT, used in this study, has been designed to determine the gains of the students in the unit of Voice. It consists of 20 multi choice questions. Each question is worth one point. The questions were arranged according to MEB (Ministry of National Education) books and some test books. It has been prepared in agreement with 5 Science and Technology teachers and academicians and it was used as pre-test and post-test. The BT has been implemented on the other classes in practice school and other schools which were thought to be the same level with the practice school to decide the reliability of the test and it is found to be 0.72 (Cronbach's Alpha) in the result of the implementation. We can say that BT is reliable by looking at this result.

TÖ was used to determine students' attitudes towards Science and Technology lesson as pre-test and post-test. Likert type scales consists of 25 questions were used as an attitude scale, prepared by Aydede, et al. [23]. There are 25 items in TÖ, 16 positive, 9 negative. Ratio of reliability scale is found to be 0.79 (Cronbach's Alpha). According to this result we can say that the TÖ is reliable.

2.1 Implementation

This study has been carried out in primary school Science and Technology lesson which has four courses in a week. There are practices of teaching process of the unit "Sound" in 5E Learning Cycling Model, Cooperative Learning Method and Traditional Model in this study. Classes were chosen carefully considering that the students were similar in characteristics and assigned randomly as control group and experiment group. Firstly BT and TÖ were applied to the groups. The data obtained from here were assessed with the help of SPSS software and observed that experiment and control groups were equivalent.

2.2 Research Findings

There are data and comments on these data in this section which is obtained from the researching of the impact 5E Learning Cycle Model, Cooperative Learning Model, and Traditional Model to the teaching of unit "Sound". BT and TÖ were applied to the students as pre-test and post-test and the data were analysed statistically through SPSS 16.0 software.

2.3 BT of Science and Technology Lesson – Preliminary Findings

BT applied to the all groups as pre-test. To determine whether there is meaningful difference between the groups, one-way ANOVA analyse was used. In the Table 1 descriptive statistics, in the Table 2 outcomes of ANOVA analyse were given.

The results of ANOVA analyses demonstrates that there is no meaningful difference between the groups statistically regarding BT scores ($P=0.273$; $P>0.05$). We can say that out of the findings, students of these three groups are similar in academic success.

2.4 TÖ of Science and Technology – Pre-Test Findings

TÖ applied to the all groups as pre-test. To determine whether there is meaningful difference between the groups, one-way ANOVA analyse was used. In the Table 3 descriptive statistics, in the Table 4 outcomes of ANOVA analyse were given.

The results of ANOVA analyses demonstrates that there is no meaningful difference between the groups statistically regarding BT scores ($P=0.639$; $P>0.05$). We can say that out of the findings, students of these three groups are similar in attitude to the lesson.

2.5 BT of Science and Technology – Findings of Post-test

BT test applied to all groups as post-test. To determine whether there is meaningful difference between the groups, one-way ANOVA analyse was used. In the Table 5 descriptive statistics, in the Table 6 outcomes of ANOVA analyse were given.

The results of ANOVA analyses demonstrates that there is meaningful difference between the

groups statistically regarding BT scores ($P=0,000$; $P<0,05$). Because there is a meaningful difference between groups, the Table 7 shows the heterogeneous distribution ($P=0.001$; $P<0.05$).

To determine the diversity in which groups, (post-hoc) games-howell test used (Table 8). According to result of Games-howell analyse, we can see that there is no meaningful difference between the group of 5E and cooperative group ($P=0.615$; $P>0.05$). However there is difference between the group of 5E and traditional group; cooperative group and traditional group. The difference is in favor of the group 5E and cooperative group. ($P=0.000$; $P<0.05$).

2.6 TÖ of Science and Technology Lesson- Findings of Post-test

TÖ test applied to all groups as post-test. One-way ANOVA analyse has been used to determine whether there is a meaningful difference between the groups. In Table 9 there is descriptive statistics, in Table 10 there are the results of ANOVA analyse.

The results of ANOVA analyses demonstrates that there is no meaningful difference between the groups statistically regarding TÖ scores ($P=0.198$; $P>0.05$).

2.7 Findings of Opinion Scale

"Opinion Scale related to 5E Learning Cycle Model" implemented to experimental group of 5E and as for cooperative group "Opinion Scale related to Cooperative Learning Method" implemented (Tables 11 and 12).

According to the findings of opinion scale concerning 5E Learning Cycle Model, students expressed that exemplaries, presentations and materials used during the lesson were interesting, their motivation and concerns to the subject increased, they found the lesson entertaining and they integrated existing knowledge with recently learned ones in other words they reconstruct their knowledge. Most of them indicated learning through 5E Learning Cycle Model is more perceptible and nice.

As we look at the results of the opinion scales concerning cooperative learning method, all of the students stated that they make a preliminary, they have chance to research, learn and study

with their friends even their motivation and concerns increased and they reconstruct their knowledge. Above all, they are pleased with class environment, they are able to study with their friends together and have chance to know about each other. Some of the students told that studying is more than enough and they got bored with this.

Table 1. Descriptive statistics of scores obtained from pre-test BT

Groups	N	X	Minimum score	Maximum score
Group of 5E	32	7.88	4	10
Cooperative group	31	8.32	5	10
Traditional group	32	7.62	4	11
Total	95	7.94	4	11

**Maximum score: 20 (each question one point)*

Table 2. ANOVA analyse related to score obtained from pre-test BT

	Sum of squares	SD	Average of squares	F	P
Inter groups	7,847	2	3,923	1,318	0,273
In-group	273,774	92	2,976		
Total	281,621	94			

Table 3. Descriptive statistics of scores obtained from pre-test TÖ

Groups	N	X	Minimum score	Maximum score
Group of 5E	32	102.44	73	123
Cooperative group	31	103.84	80	122
Traditional group	32	100.91	75	119
Total	95	102.38	73	123

Table 4. ANOVA analyse related to score obtained from pre-test TÖ

	Sum of squares	SD	Average of squares	F	P
Inter groups	135.571	2	67.785	0.450	0.639
In-group	13850.787	92	150.552		
Total	13986.358	94			

Table 5. Descriptive statistics of scores obtained from post-test BT

Groups	N	X	Minimum score	Maximum score
Group of 5E	32	13.94	7	19
Cooperative group	31	14.58	12	17
Traditional group	32	10.34	7	15
Total	95	12.94	7	19

**Maximum score: 20 (Each question one point)*

Table 6. ANOVA analyse related to score obtained from post-test BT

	Sum of squares	SD	Average of squares	F	P
Inter groups	330.979	2	165.489	25.015	0.000
In-group	608.642	92	6.616		
Total	939.621	94			

Table 7. Analyse of homogeneous test variant

Levene statistics	SD1	SD2	P
7.977	2	92	0.001

Table 8. Games-howell analyse of post-test BT

Groups (I)	Groups (J)	Average difference (I-J)	Standart error	P
Group of 5E	Cooperative group	-0.643	0.680	0.615
	Traditional group	3.594*	0.732	0.000
Cooperative group	Group of 5E	0.643	0.680	0.615
	Traditional group	4.237*	0.490	0.000
Traditional group	Group of 5E	-3.594	0.732	0.000
	Cooperative group	-4.237*	0.490	0.000

Table 9. Descriptive statistics of scores obtained from post-test TÖ

Groups	N	X	Minimum score	Maximum score
Group of 5E	32	101.91	78	124
Cooperative group	31	106.03	72	120
Traditional group	32	106.81	85	124
Total	95	104.91	72	124

*Maximum score: 25

Table 10. ANOVA analyse related to scres obtained from post-test TÖ

	Sum of squares	SD	Average of squares	F	P
Inter groups	443.586	2	221.793	1.648	0.198
In-group	12384.561	92	134.615		
Total	12828.147	94			

Table 11. Results of opinion scale applied to the students of 5E learning cycle model

Items									
1- I've managed to grasp the concepts in the subject of Sound better by 5E Learning Cycle Model.	f	15	14	3	0	0			32
	%	48	43	9	0	0			100
2- 5E Learning Cycle Model increased my motivation of learning the subject of sound.	f	20	8	4	0	0			32
	%	63	25	12	0	0			100
3- I've learned a lot about "Sound" apart from the course book through 5E Learning Cycle Model.	f	18	13	1	0	0			32
	%	56	41	3	0	0			100
4- I've recognize the importance of "Sound" in daily life through 5E Learning Cycle Model.	f	15	10	5	2	0			32
	%	48	31	15	6	0			100
5- The works we've made through 5E Learning Cycle Model have been effective to reconstruct my existing knowledge.	f	22	8	2	0	0			32
	%	69	25	6	0	0			100
6- Lessons taught through 5E Learning Model were very enjoyable.	f	25	7	0	0	0			32
	%	78	22	0	0	0			100
7- Works and presentations prepared according to 5E Learning Cycle Model interested me to the related subject.	f	17	10	5	0	0			32
	%	54	31	15	0	0			100
8- Classroom environment of 5E Learning Cycle Model is helpful to learning.	f	20	12	0	0	0			32
	%	63	37	0	0	0			100
9- I've had chance to research, learn and study with my friends thanks to 5E Learning Cycle Model.	f	15	12	5	0	0			32
	%	48	37	15	0	0			100
10- I prefer learning through 5E Learning Cycle Model to learning in a teacher-centered model.	f	22	8	0	2	0			32
	%	69	25	0	6	0			100

Items		Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree	Total
11- Owing to studies we've made through 5E Learning Model, I improved my general knowledge and enthusiasm for learning.	f	18	7	5	2	0	32
	%	57	22	15	6	0	100
12- Thanks to 5E Learning Cycle Model, I am able to communicate with teacher more efficiently.	f	20	10	2	0	0	32
	%	63	31	6	0	0	100
13- 5E Learning Cycle Model provided me to communicate with my friends democratically and friendly.	f	15	14	3	0	0	32
	%	48	43	9	0	0	100
14- 5E Learning Cycle Model provided me to make a preliminary.	f	20	5	5	2	0	32
	%	64	15	15	6	0	100

Table 12. Results of opinion scale applied to the students of cooperative learning

Items		Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree	Total
1. I've managed to grasp the concepts in the subject of Sound better by Cooperative Learning Model.	f	17	12	2	0	0	31
	%	53	37	7	0	0	100
2. Cooperative Learning Model increased my motivation of learning the subject of sound.	f	16	15	0	0	0	31
	%	51	49	0	0	0	100
3. I've learned a lot about "Sound" apart from the course book through Cooperative Learning Model.	f	18	7	6	0	0	31
	%	58	23	19	0	0	100
4. I've recognized the importance of "Sound" in daily life through Cooperative Learning Model.	f	20	10	0	1	0	31
	%	65	32	0	3	0	100
5. The works we've made through Cooperative Learning Model have been effective to reconstruct my existing knowledge.	f	25	6	0	0	0	31
	%	81	19	6	0	0	100
6. Lessons taught through 5E Learning Model were very enjoyable.	f	16	11	4	0	0	31
	%	51	36	13	0	0	100
7. Works and presentations prepared according to Cooperative Learning Model interested me to the related subject.	f	15	16	0	0	0	31
	%	49	51	0	0	0	100
8. Classroom environment of Cooperative Learning Model is helpful to learning.	f	24	7	0	0	0	31
	%	77	23	0	0	0	100
9. I've had chance to research, learn and study with my friends thanks to Cooperative Learning Model.	f	27	4	0	0	0	31
	%	87	13	0	0	0	100
10. I prefer learning through Cooperative Learning Model to learning in a teacher-centered model.	f	23	5	3	0	0	31
	%	74	16	10	0	0	100
11. Owing to studies we've made through 5E Learning Model, I improved my general knowledge and enthusiasm for learning.	f	13	15	0	3	0	31
	%	41	49	0	10	0	100
12. Thanks to Cooperative Learning Model, I am able to communicate with teacher more efficiently.	f	15	13	2	1	0	31
	%	49	41	7	3	0	100
13. Cooperative Learning Model provided me to communicate with my friends democratically and friendly.	f	22	9	0	0	0	31
	%	71	29	0	0	0	100
14. Cooperative Learning Model provided me to make a preliminary.	f	26	5	0	0	0	31
	%	84	16	0	0	0	100

3. DISCUSSION AND RESULTS

Our purpose in this work is to evaluate the impacts of teaching "sound" through 5E Learning Cycle Model and Cooperative Learning Method to the students' academic success and attitudes in Science and Technology lesson in 8th grade. Therefore, we tried to make certain whether there was a meaningful difference between pre-test and post-test, attitude scale and success test scores of experimental group and control group. ANOVA analyse was used to perform this. Because the impact of independent variances (5E Learning Cycle Model, Cooperative Learning Model and traditional method) on dependent variances were researched.

First of all, in the study, it was researched whether there was a meaningful difference between the groups considering the pre-test scores obtained from BT and there seemed to be no difference. According to these results, students in the groups of 5E Learning Model, Cooperative Learning Model and traditional model are similar in terms of academic success.

Afterwards, TÖ test was applied to all groups. When we compared the results of statistical analyse of pre-test scores, we could see that there was a meaningful difference between the groups. According to these results, the students in the group of 5E, cooperative and traditional learning, they show similar characteristics in terms of attitudes to Science and Technology lesson.

After teaching "sound", BT and TÖ were applied to students again. As the results of the inter-group post-test BT, it was observed that there was a meaningful difference between groups (Table 6). To determine the difference in which groups (post-hoc), games howell test was adopted. Results belonging to games-howell test are given in the Table 8. But, there is meaningful difference between the group of 5E and traditional group; cooperative group and traditional group, this difference is found to be in favor of the group of 5E and cooperative. It is concluded that there is no meaningful difference between the group of 5E and cooperative.. This difference is on the benefit of constructivist method and this is in accordance with the result we had.

5E Learning Cycle Model and cooperative learning model are based on constructivist method, but one is based on cognitive and the

other is based on social constructivism which were the subjects of the research. According to statistical results, there is not any difference between the both method and hereunder we could say that teachers could choose one of the methods considering social structure of students and physical conditions of schools.

On the other side, as much as 5E Learning Cycle Model is a practice of cognitive constructivism, it is beneficial to social interactions and it doesn't totally externalise social constructivism. Likewise, even if cooperative learning method is a way of social constructivism practice, it doesn't externalize cognitive constructivism totally and both of the practice have common ways. For this reason, among experiment groups, there is no meaningful difference. But also success scores of 5E Learning Cycle Method has high upper limits and low lower limits considering the scores of Cooperative Learning Method.

Success grades in cooperative and 5E learning method are moderate, not too high or low. It shows that through 5E Learning Cycle Model, we can maximize skills and successes of willing students in Science and Technology lesson by individually dealing with them. If the students who are keen on Science wanted to be improved, 5E Learning Cycle can be used. If the whole class wanted to be improved, cooperative learning method should be more appropriate. After the practice is over, TÖ was applied as post-test. As we compared results, there seemed to be meaningful difference between the groups. The reason we cannot notice this impact is that the practice is limited for only one unit and it's not easy for students to change their attitudes in a short time period like one month.

As a result, opinion scales that applied to groups of 5E Learning Cycle and Cooperative Learning Model showed us students had positive thoughts regarding the methods. They stated that learning a lesson through the 5E Learning Method is better than just learning through the book and it helped them to grasp the topics easier. They also told the mentioned method was more effective to reconstruct their existing knowledge and the lesson was more enjoyable than an normal lesson. According to them, classroom environment was more helpful to understand to topic that's why they prefer the 5E Learning Method to Teacher Centered method.

As for Cooperative Learning students have positive comments for his method, too. They

said they understood the subject quicker and the method increased their motivation towards the lesson. The method helped them to realize the importance of “sound” subject in daily life. They told the lessons were more enjoyable and they had chance to work with their friends.

4. CONCLUSION

As we look at the practice, we observed that teachers easily used the 5E Learning Cycle Model in courses, but they had difficulty in using cooperative learning method in overcrowded classrooms. Some problems occurred in performing cooperative learning method, but there seemed to be no problem in carrying out 5E Learning Cycle Model.

5. SUGGESTIONS

In the framework of this study, suggestions regarding the results are listed below.

1. When teaching “sound” in 8th grade, teachers may prefer 5E learning cycle and cooperative learning model to traditional models.
2. 5E Learning Cycle Model and Cooperative Learning Model should be introduced before the practice meticulously.
3. Not only Science teachers but also other branch’s teachers should teach lesson via mentioned learning models.
4. In performing cooperative learning method, classroom environment should be organized well.
5. 5E Learning Cycle Model may be preferred for primary school students when it comes to time.
6. There is no changes observed in students attitudes to lesson for this short time period. Therefore another research that concentrates on the impact of method to the attitudes for a long time period can be done.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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