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The Impact of Peer Instruction on Academic Achievements and Creative Thinking Skills of College Students

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Abstract: In the context that it was scrutinized in the present study, peer instruction was initially developed by Eric Mazur, a physicist. The aim of the present study was to determine the impact of peer instruction method on academic achievements and creative thinking skills of the students. The study was conducted with the pre-test-posttest control group method, a quasi-experimental design, which was defined as a two-factor mixed design. The study was conducted with sophomore students attending Firat University (FU), Faculty of Education, Social Studies Teaching Department in Turkey during the 2018-2019 academic year spring semester. The experiment (N = 30) and control (N = 30) groups were determined with convenience sampling (a non-random sampling method). Present study findings demonstrated that peer instruction method improved the achievement and creative thinking skill levels of the students. However, it was observed that the method was more effective on course achievement.

Keywords: *Peer instruction, creative thinking, academic achievements.*

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Introduction

The most significant objective of education today is to train positive, creative and efficient individuals, who could adapt to different conditions, could think flexible open, free and scientifically. Acquisition of the desired behavior by the students depends on the conduct of classroom activities at all levels in formal education institutions (Arslantas, 2011). The question of how the students would acquire the content most effectively leads to the ways of teaching. Ways of teaching includes the teaching approach, teaching method and teaching techniques. Instruction method is a way of teaching conducted to integrate the techniques, the topic of instruction, material and resources (Aydin, 2001).

Today, instead of conventional teacher-centered instruction methods and techniques, which bore the students, attractive, interesting and student-centered methods that lead to active students are adopted. Thus, it was attempted to ensure that the students would learn how to learn via these methods (Bulut & Cakmak, 2017). Several studies reported that the methods and techniques that allow the active participation of the students lead to a more effective, qualified and permanent education. One of the methods that improve the quality of education and allow the active participation of the students in the class is the method of peer instruction. An interaction-oriented approach, the peer instruction method is based on student participation, thus it is one of the most important and productive methods, since it emphasizes democratic approaches and has both cognitive and emotional aspects, allows in-classroom communication, resulting in a desired development.

In the context that it was scrutinized in the present study, peer instruction was initially developed by the physicist Eric Mazur. Mazur, who had been instructing physics courses with conventional methods for many years, implemented certain changes in instruction techniques, and aimed to develop a positive attitude towards the course and permanent learning. After certain trial-and-error attempts, he developed the method known as peer instruction (Unalan, 2010). The main objective of peer instruction method is to draw students' attention to basic concepts using student interaction throughout the course. Rather than presenting the information included in the textbook or in lecture notes in a detailed manner, the method aimed to conduct a series of presentations on key points, followed by a discussion of short conceptual questions on the topic with full student interaction (Mazur, 1997). Mazur (1997), who used computers and

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technology effectively in the classroom in this method, asked each student to think about the question for a few minutes after the problem is presented on the screen. There was a silence in the classroom during this time. Then, everyone selected one of the answer options using a small instrument, which is similar to a remote control, called a clicker. With these devices that communicate with the teacher's computer via infrared or radio signals, each student response was transferred to the computer. The software installed on the computer analyzed all student responses within a few seconds, and a bar graph for a, b, c, d multiple choice selections appeared on the screen, where everyone could see the selection percentages. Since it was not known who selected which option, the fear of making mistakes was automatically prevented and the participation of shy and timid students in the instruction was ensured. Then, students formed small groups and started discussing the question among their peers. They attempted to convince each other and explain the reasons for their responses. During this activity, the teacher should participate in the discussions when it was necessary or requested by the students. The students then take their clickers again and responded the questions once more. In general, after the second responses, the bar graph changed in favor of the correct answer. Those who were not convinced were assisted by the peers and (Unalan, 2010) If majority of the students answered the conceptual test correctly, then a new topic was instructed. When the percentage of correct answers was too low, the topic was instructed in more detail and reviewed again with a new conceptual test.

The peer teaching method has a number of advantages based on the reference of previous studies. In this method, the students' efforts to convince their neighbors breaks the monotony of static instruction (Mazur, 1997). It provides permanent learning.

Peer Instruction Format

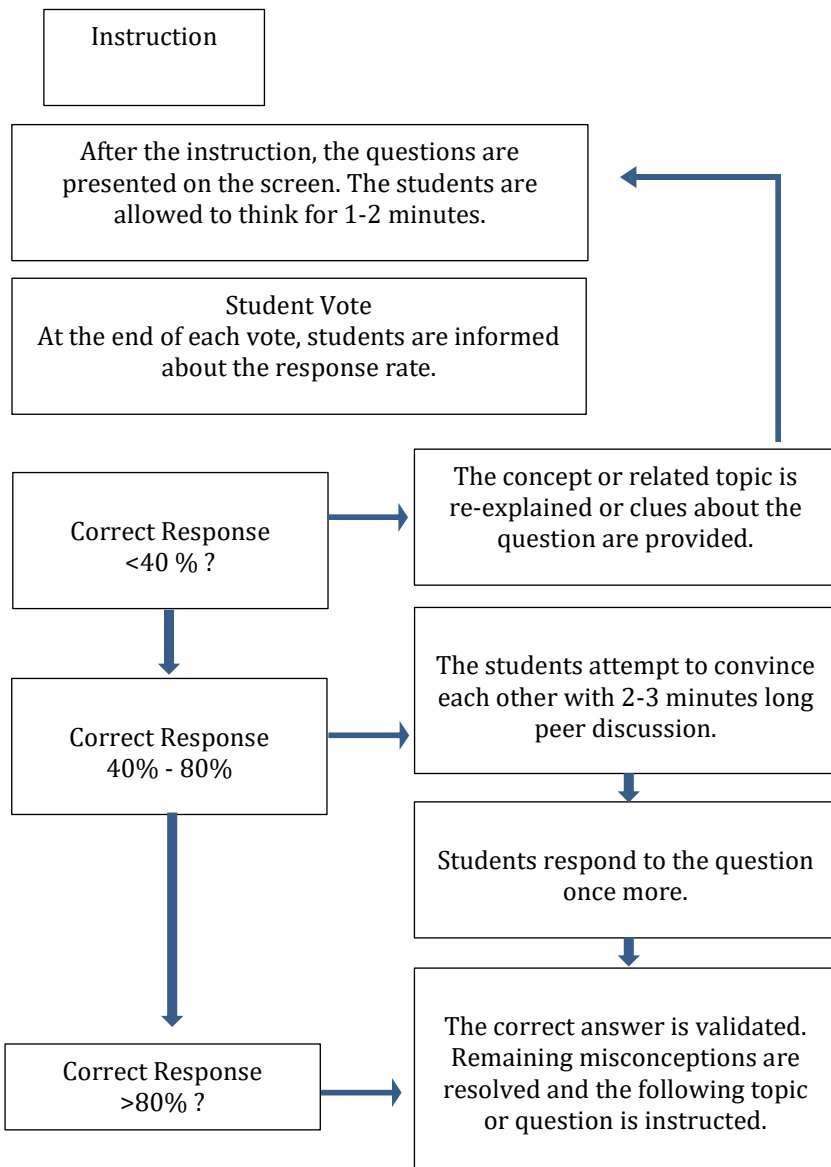


Figure 1. Peer Instruction Format

Method

In the study, pre-test-posttest control group quasi-experimental design, which was defined as a two-factor mixed design, was used. This study was a quasi-experimental study based on the determination of the groups before the application and other properties. A quasi-experimental design is a research method where participants are not randomly assigned to groups. This is valid when the researcher cannot artificially form a group for the experiment (Creswell, 2008). The most commonly used design in semi-experimental research is the non-equivalent comparison group design. This design includes both experiment and comparison (control) groups. However, the participants are not randomly assigned to the groups. Researches where such preferences are made are called quasi-experimental studies. In other words, these are the studies where internal and external validity, which could be considered as a measure of experimental studies, are not fully met. The pre-test-posttest control group design is also called a mixed design, since it is considered as both correlated and non-correlated. Since the subjects are measured in relation to the dependent variable before and after the experimental procedure, it is a correlated design, and since the measurements for the experiment and control groups that include different subjects are compared, it is a non-correlated design (Buyukozturk, Kilic Cakmak, Akgun, Karadeniz, & Demirel, 2011). The experimental design can be used to decide whether an independent variable (a particular instruction method) has an effect on a dependent outcome variable (academic achievement, creative thinking) (Plano Clark & Creswell, 2015). Comparison is always present in these research designs. In the present study, the impact of the use of conventional and peer instruction methods on students' academic achievement and creative thinking skills in learning the "Science and Technology in Middle Ages, New Age and Modern Age" topic in "Science, Technology and Social Change" course of the sophomore students in Firat University, Faculty of Education, Social Studies Teaching Department.

The Study Group

The research was conducted during the 2018-2019 academic year spring semester. The participants included sophomore students in Firat University, Faculty of Education, Social Studies Teaching Department. The study experiment (N = 30) and control (N = 30) groups were determined with convenience sampling, a non-random sampling method. Convenience sampling is the inclusion of easy accessible and applicable subjects due to time, economic and labor constraints (Buyukozturk et al., 2011).

Data Collection Instruments

Based on the study objectives, an achievement test (pre-test and post-test), developed in compliance with the Social Studies Undergraduate Sophomore Curriculum and the Creative Thinking Test were used as the data collection instruments. In this section, information about the development and improvement of data collection instruments and the data collection process are discussed.

Achievement Test: An achievement test previously developed for course exams was used to determine the prior knowledge of the students on Science, Technology and Social Change course, and the effectiveness of the use of peer instruction method on learning and student achievements after the application.

Creativity Scale (How creative are you?): To determine the creativity of the students, the "How creative are you?" scale, developed by Whetton and Cameron (2002), was used. The statements in the aforementioned scale were translated to Turkish language by Aksoy (2004) and validity and reliability studies were conducted by the same author. In the scale, 39 items are Likert-type, 1 item is categorical, and the total number of items is 40. The creativity scale characterizes the traits, attitudes, values, motives and interests of the students. It was also developed to help identify high creative personality of the students. For each statement that aims to determine the creativity traits of the students in the scale, A) I agree B) I am not sure C) I disagree options are presented and students participating in the study were asked to mark the option that is most adequate for them. Each item has a different score in the scale. The lowest item score is -2 and the highest item score is 4.

Findings

In this section, the analysis results that demonstrate the differences between the academic achievements and creative thinking skills of the group where peer instruction method was applied and the group where it was not applied are presented.

Research Question 1: Is there a significant difference between pretest and posttest achievement scores of the students in experiment and control groups?

H_0 : There is no significant difference between pretest and posttest achievement scores of the students in experiment and control groups.

Descriptive Statistics

Descriptive statistics about the hypothesis is presented with group counts, averages, standard deviations, skewness and kurtosis values below.

Table 1. Descriptive Statistics Based on Pretest Posttest Mean Academic Achievement Scores of Experiment and Control Groups

| Groups | Pretest | | | Posttest | | |
|------------------|---------|-----------|-------|----------|-----------|-------|
| | N | \bar{X} | S | N | \bar{X} | S |
| Experiment Group | 30 | 68.07 | 15.00 | 30 | 84,37 | 11.82 |
| Control Group | 30 | 72.30 | 12.46 | 30 | 81.00 | 8.08 |

Table 1 demonstrated that the mean pretest academic achievement scores of the students were similar. To test the similarity between the groups, t-test was conducted on the pretest scores of the experiment and control groups. Based on the t-test analysis, there was no statistically significant difference between the pretest scores of the groups ($F = .630$, $p = .306$). Thus, it could be suggested that the group scores were similar in the pretest stage. The mean posttest scores of the groups were different. In order to determine whether the difference was statistically significant, "intergroup and intragroup analysis of covariance" (repeated measures) was used and the findings were ranked.

Table 2: Covariance Matrix for Experiment and Control Group Mean Pretest and Posttest Academic Achievement Scores

| Box's Test of Equality of Covariance Matrices | |
|---|------------|
| Box's M | 5.943 |
| F | 1.907 |
| df1 | 3 |
| df2 | 605520.000 |
| Sig. | .126 |

There should be no difference between the group covariances of the measured group pairs (Can, 2015). The box test conducted to test this condition revealed that there was no significant difference between covariances as presented in Table 3 ($P > 0.050$).

Table 3: Mauchly's Test of Sphericity Findings

| Within Subjects Effect | Mauchly's W | Approx. Chi-Square | df | Sig. | Greenhouse-Geisser | Epsilon ^a Huynh-Feldt | Lower-bound |
|------------------------|-------------|--------------------|----|------|--------------------|----------------------------------|-------------|
| Measurement | 1,000 | ,000 | 0 | . | 1,000 | 1,000 | 1,000 |

Mauchly's Test of Sphericity findings presented in Table 3 demonstrated that the significance level was not calculated (null). Mauchly's Test of Sphericity is significant when the number of measurements is more than two (Can, 2015). In cases where the significance level is not calculated, that is, when the assumption of sphericity is not confirmed, it is known that the probability of making type 1 error increases. Greenhouse-Geisser results, which are used to eliminate this problem, are presented below.

Table 4: Repeated Measures ANOVA Findings Based on Experiment and Control Group Mean Pretest and Posttest Academic Achievement Scores

| Source | | Type III Sum of Squares | df | Mean Square | F | p | Partial Eta Squared |
|---------------------|--------------------|-------------------------|-------|-------------|--------|------|---------------------|
| Measurement | Greenhouse-Geisser | 4650.074 | 1,000 | 4650.074 | 43,728 | ,000 | ,430 |
| Measurement * GROUP | Greenhouse-Geisser | 444,675 | 1,000 | 444,675 | 4,182 | ,045 | ,067 |

Table 4 demonstrates that the difference between measurements was significant. In other words, the difference between pre-test and post-test scores was significant independent of the group. The effect size of the difference between measurements demonstrated that the size was large. In the other section, when the measurement * group interaction was reviewed, it was observed that use of peer instruction method in the experimental group had an impact on the academic achievement of the students. Thus, based on these findings, there was a significant difference between the experiment ($\bar{X} = 84.37$) and control groups ($\bar{X} = 81.00$) favoring the experimental group. ($F = 4.182$, $p < .05$). Review of the effect size demonstrated that the effect size was moderate to high, that is, above average (Cohen, 1988; as cited in: Tabachnick & Fidell, 2007).

Table 5: Levene Test Findings on Group Pretest and Posttest Scores

| | F | df1 | df2 | Sig. |
|----------|-------|-----|-----|------|
| PRETEST | 1.377 | 1 | 58 | .245 |
| POSTTEST | 2.022 | 1 | 58 | .160 |

Table 5 demonstrated that the variances were equal in both pretest ($F=1.377$, $p>0.050$) and posttest ($F=2.022$, $p>0.050$) scores of the groups based on the Levene test.

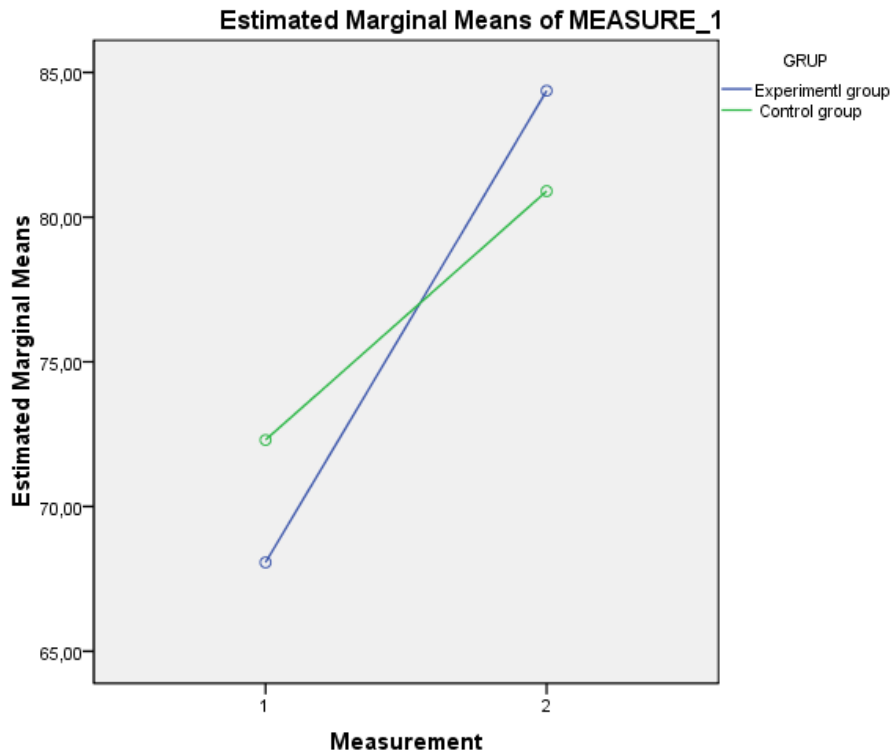


Figure 1: Group Pretest and Posttest Scores

As seen in the graph presented in Figure 1, the group averages that were close to each other in the first measurement differentiated in favor of the experiment group in the second measurement.

In other words, it was observed that the posttest achievement scores of the experiment and control groups were higher when compared to the pretests scores. Therefore, it was observed that both experiment and control group achievements increased. However, it was determined that the achievement of the experiment group increased significantly higher when compared to the control group.

Research Question 2: Is there a significant difference between pretest and posttest creative thinking scores of the students in experiment and control groups?

H_0 : There is no significant difference between pretest and posttest creative thinking scores of the students in experiment and control groups?

Descriptive Statistics

Descriptive statistics about the hypothesis is presented with group counts, averages, standard deviations, skewness and kurtosis values below.

Table 6: Descriptive Statistics Based on Pretest Posttest Mean Creative Thinking Scores of Experiment and Control Groups

| Groups | Pretest | | | Posttest | | |
|------------------|---------|-----------|-------|----------|-----------|-------|
| | N | \bar{X} | S | N | \bar{X} | S |
| Experiment Group | 30 | 44.87 | 8.48 | 30 | 45.97 | 8.95 |
| Control Group | 30 | 40.50 | 10.33 | 30 | 41.10 | 10.00 |

Table 6 demonstrated that the mean pretest creative thinking scores of the students were similar. To test the similarity between the groups, t-test was conducted on the pretest scores of the experiment and control groups. Based on the t-

test analysis, there was no statistically significant difference between the pretest scores of the groups ($F = 1.201$, $p = .278$). Thus, it could be suggested that the group scores were similar in the pretest stage. The mean posttest scores of the groups were different. In order to determine whether the difference was statistically significant, "intergroup and intragroup analysis of covariance" (repeated measures) was used and the findings were ranked.

Table 7: Covariance Matrix for Experiment and Control Group Mean Pretest and Posttest Creative Thinking Scores

| Box's Test of Equality of Covariance Matrices | |
|---|------------|
| Box's M | 2.781 |
| F | 0.892 |
| df1 | 3 |
| df2 | 605520.000 |
| Sig. | 0.444 |

There should be no difference between the group covariances of the measured group pairs (Can, 2015). The box test conducted to test this condition revealed that there was no significant difference between covariances as presented in Table 7 ($p > 0.050$).

Table 8: Mauchly's Test of Sphericity Findings

| Within Subjects Effect | Mauchly's W | Approx. Chi-Square | df | Sig. | Greenhouse-Geisser | Epsilon ^a Huynh-Feldt | Lower-bound |
|------------------------|-------------|--------------------|----|------|--------------------|----------------------------------|-------------|
| Measurement | 1,000 | ,000 | 0 | . | 1,000 | 1,000 | 1,000 |

Mauchly's Test of Sphericity findings presented in Table 8 demonstrated that the significance level was not calculated (null). Mauchly's Test of Sphericity is significant when the number of measurements is more than two (Can, 2015). In cases where the significance level is not calculated, that is, when the assumption of sphericity is not confirmed, it is known that the probability of making type 1 error increases. Greenhouse-Geisser results, which are used to eliminate this problem, are presented below.

Table 10: Repeated Measures ANOVA Findings Based on Experiment and Control Group Mean Pretest and Posttest Creative Thinking Scores

| Source | Type III Sum of Squares | df | Mean Square | F | p | Partial Eta Squared |
|---------------------|---------------------------|--------|-------------|--------|-------|---------------------|
| Measurement | Greenhouse-Geisser | 21.675 | 1 | 21.675 | 0.747 | 0.391 |
| Measurement * GROUP | Greenhouse-Geisser | 1.875 | 1 | 1.875 | 0.065 | 0.800 |

Table 10 demonstrates that the difference between measurements was not significant. In other words, the difference between pre-test and post-test scores was not significant independent of the group. In the other section, when the measurement * group interaction was reviewed, it was observed that use of peer instruction method in the experimental group had an impact on the creative thinking scores of the students. However, based on these findings, there was no significant statistical difference between the experiment ($\bar{X} = 45.97$) and control groups ($\bar{X} = 41.10$) ($F = .747$, $p < .05$).

Table 11: Levene Test Findings on Group Pretest and Posttest Scores (Levene's Test of Equality of Error Variances)

| | F | df1 | df2 | Sig. |
|-----------------|-------|-----|-----|-------|
| PRETEST | 1.201 | 1 | 58 | 0.278 |
| POSTTEST | 0.843 | 1 | 58 | 0.362 |

Table 11 demonstrated that the variances were equal in both pretest ($F=1.201$, $p>0.050$) and posttest ($F=0.843$, $p>0.050$) scores of the groups based on the Levene test.

Conclusion

In the present study, it was observed that the student achievement levels increased in both experiment group, where peer instruction method was used, and the control group, where current curriculum instruction and activities were used. However, the comparison between the groups demonstrated that the experiment group students were more successful when compared to the control group students. Again as a result of this research, it was observed that the creative thinking levels of the students increased in both experimental and control groups. However, there were no statistically significant differences in intra- and inter-group comparisons.

Discussion

In the present study, it was determined that the impact of peer instruction method, tested in the Social Studies Teaching undergraduate course, on individual's academic achievements and creative thinking skills was significantly positive. Since the development of this method by Eric Mazur, dozens of experiments were conducted in Turkey and abroad, and dozens of articles were published on this method. Despite the specific rules and implementations of the method, the studies in the literature demonstrated without doubt that it was a significant method that reflects the importance and requirement of constructing cohabitation rules and collaboration in the creation of the values of cohabitation in addition to allowing the individuals to study, act with solidarity, discuss and collaborate with their peers.

It was observed that the positive impact, disadvantages and various characteristics of the method were comprehensively investigated in each accessed study conducted since the first application of the peer instruction method. In studies conducted in Turkey on peer instruction method, its effects on students' academic achievement and retention of learning, on the interest and attitude towards the course, the attitude towards the method, teaching skills, and on learning and teaching experiences of pre-service teachers, its role in acquisition of scientific process skills, its impact on comprehension level, conceptual learning, motivation and self-efficacy were investigated and it was demonstrated that it led to significant achievements although the effect size and rate differed (Tokgoz, 2007; Can, 2009; Demirci & Sekercioglu, 2009; Sen, 2010; Kavanoz & Yuksel, 2010; Akay, 2011; Savas, 2011; Sekercioglu, 2011; Gok, 2012; Yavuz, 2014; Mazlum, 2015; Gulcek, 2015).

In international studies conducted on peer instruction, it was demonstrated that the method had a significant effect on the student attendance, interest, achievements, comprehension, synthesis skills and integration (Trent, 1996; Rao & DiCarlo, 2000; Harvey, 2003). It was reported that student dialogues and discussions that takes place during peer instruction had positive effects on learning (Nicol & Boyle, 2003). Although it is predominantly used in in the field of science, the effects of peer instruction on philosophy and logic instruction and it was determined that it had significantly positive effects on comprehension, feedback, and critical and creative thinking skills of most students (Butchart, Handfield & Restall, 2009). Consequently, the peer instruction method was applied in the fields of physics, biology, chemistry, mathematics, science, philosophy, logic, English language, computer sciences and engineering.

In a study conducted by Dumont (2013) in Switzerland, it was reported that the English language course instructed by peer instruction method improved the self-esteem of the students and was effective on conceptual reasoning. There are also long-term studies conducted on the method. Crouch and Mazur (2001), for instance, conducted a ten-year long experimental study to reveal the effects of peer instruction more comprehensively and in depth. The study findings demonstrated that the ten-year long peer instruction improved both the conceptual thinking and quantitative problem solving skills of the students.

Apart from the personal outcomes of the studied topic in peer instruction method, further studies that test different aspects of the method were conducted. For example, during the early years of peer instruction method, student responses were collected with flash cards that contained the A, B, C, D options due to technological limitations. Later on, student responses were collected with an i-clicker electronic student response system, which were initially wired, then utilized infrared and Bluetooth connections. In that transition phase, Lucas (2009) introduced a novelty to prevent the mathematics students to send their responses using flash cards and introduced i-clickers to perform the same function in peer instruction method. It was observed that the peer instruction method, re-tested with clickers, improved student participation and comprehension in the class. It was determined and reported that peer instruction with i-clicker had a more significant effect on learning.

The outcomes of various implementations of the activities in peer instruction were tested in a study. In the study conducted by Perez et al. (2010), it was investigated whether the second responses after the initial discussion conducted during the peer instruction system when the students gave their first responses using the i-clicker system were prejudiced. In the control group, students were asked to discuss the responses without knowing the most popular response and seeing the response distribution on a bar graph. In the case where the students saw the bar graph, the conversion from incorrect response to correct response was 30% higher. This tendency was 28% in multiple choice questions and 38% in right-wrong questions. These findings indicated that it might not be accurate that the student's performance on the question would improve after only a single discussion and could affect the student's second

response for a question. Thus, it was reported that the outcomes of the peer instruction method were positive, albeit extremely overestimated.

In a different study, peer instruction method was conducted by 3 researchers in 3 classrooms at the same time and for the same time period and the method process was noted. At the end of the semester, the collected data were used to determine student perceptions about the settings. The findings demonstrated a significant correlation between the researchers' comments and the perceptions of the students (Turpen & Finkelstein, 2010).

It was observed that the positive impact, disadvantages and various characteristics of the method were comprehensively investigated in each accessed study conducted since the first application of the peer instruction method. In studies conducted in Turkey on peer instruction method, its effects on students' academic achievement and retention of learning, on the interest and attitude towards the course, the attitude towards the method, teaching skills, and on learning and teaching experiences of pre-service teachers, its role in acquisition of scientific process skills, its impact on comprehension level, conceptual learning, motivation and self-efficacy were investigated and it was demonstrated that it led to significant achievements although the effect size and rate differed (Tokgoz, 2007; Can, 2009; Demirci & Sekercioglu, 2009; Sen, 2010; Kavanoz and Yuksel, 2010; Akay, 2011; Savas, 2011; Sekercioglu, 2011; Gok, 2012; Yavuz, 2014; Mazlum, 2015; Gulcek, 2015).

In international studies conducted on peer instruction, it was demonstrated that the method had a significant effect on the student attendance, interest, achievements, comprehension, synthesis skills and integration (Trent, 1996; Rao & DiCarlo, 2000; Harvey, 2003). It was reported that student dialogues and discussions that takes place during peer instruction had positive effects on learning (Nicol & Boyle, 2003). Although it is predominantly used in the field of science, the effects of peer instruction on philosophy and logic instruction and it was determined that it had significantly positive effects on comprehension, feedback, and critical and creative thinking skills of most students (Butchart, Handfield & Restall, 2009). Consequently, the peer instruction method was applied in the fields of physics, biology, chemistry, mathematics, science, philosophy, logic, English language, computer sciences and engineering.

In a study conducted by Dumont (2013) in Switzerland, it was reported that the English language course instructed by peer instruction method improved the self-esteem of the students and was effective on conceptual reasoning. However, this study was conducted with extracurricular assignments. In the study, an exercise application was conducted on the common language practice of the classroom with written responses through the instruction of the course using Wiki (a knowledge base that allows editing by all) in extracurricular assignments to improve teacher-student communications. In other words, the peer instruction method was implemented using Wiki in homework assignments. This was an application designed to assist students to increase their participation in peer discussions when doing their homework and to improve student comprehension. The Wiki was used to develop common pre-course work with more conventional instruction methods. In fact, at the end of the application, student scores were found to be satisfactorily high. There are also long-term studies conducted on the method. Crouch and Mazur (2001), for instance, conducted a ten-year long experimental study to reveal the effects of peer instruction more comprehensively and in depth. The study findings demonstrated that the ten-year long peer instruction improved both the conceptual thinking and quantitative problem solving skills of the students.

Apart from the personal outcomes of the studied topic in peer instruction method, further studies that test different aspects of the method were conducted. For example, during the early years of peer instruction method, student responses were collected with flash cards that contained the A, B, C, D options due to technological limitations. Later on, student responses were collected with an i-clicker electronic student response system, which were initially wired, then utilized infrared and Bluetooth connections. In that transition phase, Lucas (2009) introduced a novelty to prevent the mathematics students to send their responses using flash cards and introduced i-clickers to perform the same function in peer instruction method. It was observed that the peer instruction method, re-tested with clickers, improved student participation and comprehension in the class. It was determined and reported that peer instruction with i-clicker had a more significant effect on learning.

The outcomes of various implementations of the activities in peer instruction were tested in a study. In the study conducted by Perez et al. (2010), it was investigated whether the second responses after the initial discussion conducted during the peer instruction system when the students gave their first responses using the i-clicker system were prejudiced. In the control group, students were asked to discuss the responses without knowing the most popular response and seeing the response distribution on a bar graph. In the case where the students saw the bar graph, the conversion from incorrect response to correct response was 30% higher. This tendency was 28% in multiple choice questions and 38% in right-wrong questions. These findings indicated that it might not be accurate that the student's performance on the question would improve after only a single discussion and could affect the student's second response for a question. Thus, it was reported that the outcomes of the peer instruction method were positive, albeit extremely overestimated in certain cases.

In a different study, peer instruction method was conducted by 3 researchers in 3 classrooms at the same time and for the same time period and the method process was noted. At the end of the semester, the collected data were used to

determine student perceptions about the settings. The findings demonstrated a significant correlation between the researchers' comments and the perceptions of the students (Turpen & Finkelstein, 2010).

In conclusion, the review of previous studies on peer instruction revealed that the findings were consistent with those obtained in the present study. Considering the subject area, objectives and achievements of the social studies undergraduate program, it was suggested that peer instruction may lead to the development of students in several areas. It was predicted that the skills, which were included in undergraduate education social studies curriculum and should be acquired, developed and transferred to life, had a direct correlation with this method and peer instruction method would contribute significantly to the acquisition these skills. The impact of peer instruction method on individual's critical thinking and creative thinking skills was directly investigated and it was reported that it had a positive impact as evidenced with pre-test and post-test findings. Furthermore, based on previous studies, the characteristics of the method and the nature of social studies would support that the method would contribute to the skills that social studies course aims the students to acquire including communication skills, problem-solving skills, decision-making skills, ability to use information technologies, entrepreneurship skills, fluency in Turkish language and rhetoric, social participation and empathy skills. Also, it is predicted that the method would contribute positively to the values that Social Studies undergraduate curriculum aims to instruct, including being scientific, solidarity, tolerance, respect, responsibility and benevolence.

Peer instructed method, tested in Science, Technology and Social Change course attended by the students attending Social Studies Teaching Department, had significant positive effects on the academic achievements of the students. Since the development of this method by Eric Mazur, dozens of experiments were conducted in Turkey and abroad and dozens of articles were published about this method. Despite the specific rules and implementations of the method, the studies in the literature demonstrated without doubt that it was a significant achievement that reflects the importance and requirement of constructing cohabitation rules and collaboration in the creation of the values of cohabitation in addition to allowing the individuals to study, act with solidarity, discuss and collaborate with their peers that were effective on the achievement of the individuals.

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