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The Effects of Questioning Skills Training on Question Forming Levels of Turkish Secondary School Students*

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Abstract
This study was conducted to determine the effect of question-asking skills training on the distribution of students' generated questions according to the stages of the reading process and the cognitive process dimension of the revised Bloom's taxonomy. The research employed a quasi-experimental design with a pre-test and post-test control group. The sample consisted of 58 fifth-grade students during the 2016–2017 academic year. The data were collected through a narrative text administered to both groups. During the research process, the experimental group received 16 hours of training on question-asking skills. The collected data were analyzed using content analysis. Subsequently, the Wilcoxon Signed-Rank Test was used to identify changes in the cognitive process dimension of the revised Bloom's taxonomy. The findings revealed that, in the pre-test, both groups benefited from questions only after reading and mostly generated questions at the lower-order thinking levels of remembering and understanding. In the post-test, the questions generated by the control group were similar to those from the pre-test. However, the experimental group produced questions covering all stages of the reading process. Additionally, in the post-test results, a significant difference was found in the distribution of the questions generated by the experimental group across the cognitive process dimension—except for the remembering and applying levels. The experimental group also generated questions at the evaluating and creating levels. The findings demonstrate that question-asking skills training enables students to utilize questions more effectively throughout the reading process.
Keywords: Reading process, question, revised Bloom's taxonomy, cognitive process dimension, question distribution

Soru Sorma Becerisi Eğitiminin Ortaokul Öğrencilerinin Soru Üretme Düzeyine Etkisinin İncelenmesi

Öz
Bu araştırma, soru sorma becerisi eğitiminin öğrencilerin oluşturdukları soruların okuma sürecinin aşamalarına ve Yenilenmiş Bloom Taksonomisi'nin bilişsel süreç boyutuna göre dağılımına etkisini belirlemek üzere yapılmıştır. Ön-son test kontrol gruplu yarı deneysel desen kullanılan çalışmanın örneklemi 2016-2017 eğitim-öğretim yılında 5. sınıfta öğrenim gören 58 öğrencidir. Araştırma verileri, iki gruba da uygulanan hikâye metni aracılığıyla elde edilmiştir. Araştırma sürecinde deney grubuna 16 saat, soru sorma eğitimi verilmiştir. Ulaşılan verilere içerik analizi yapılmıştır. Daha sonra Yenilenmiş Bloom Taksonomisi'nin bilişsel süreç boyutundaki farklılaşmayı tespit etmek için Wilcoxon İşaretli Sıralar Testi yapılmıştır. Araştırma sonucunda, her iki grubun ön-testte sorulardan sadece okuma sürecinden sonra yararlandığı, Yenilenmiş Bloom Taksonomisi'nin bilişsel süreç boyutunda ise daha çok hatırlama ve anlama basamaklarında soru sorduğu görülmüştür. Son-testte

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ise kontrol grubunun hazırladığı soruların, ön-testte elde edilen bulgularla benzer olduğu görülmüştür. Deney grubunun ise son-testte okuma sürecinin her aşamasına yönelik sorular oluşturduğu görülmüştür. Aynı zamanda deney grubunun oluşturduğu soruların Yenilenmiş Bloom Taksonomisi'nin bilişsel süreç boyutuna göre dağılımında ön ve son-test sonuçları arasında hatırlama ve uygulama basamakları haricinde anlamlı farklılık olduğu görülmüştür. Son-testte deney grubu, değerlendirme ve yaratma basamağında da sorular sormuştur. Elde edilen bulgular, soru sorma eğitimiyle öğrencilerin sorulardan daha etkin şekilde yararlanabileceğini ortaya koymuştur.
Anahtar Kelimeler: Okuma süreci, soru, Yenilenmiş Bloom Taksonomisi, süreç boyutu, soru dağılımı

Introduction

Questions, which cover a large part of people's lives, from simple questions frequently encountered in daily life to academic inquiries, have been one of the most basic ways of obtaining information since the beginning of human existence as a means of activating cognitive abilities (Aydemir and Çiftçi, 2008). Questions, which have an important place in daily life and are thought to be included in the teaching process with Socrates (Büyükalan, 2007; Şimşek, 2008), also play a critical role in the learning-teaching process (Bektaş and Şahin, 2007). These questions constitute a fundamental element for effective learning (Şevik, 2004). Because effective learning requires the student's participation in thinking processes and the presence of questions that keep the mind active in this process is important (Koray et al., 2002).

In education programmes prepared according to today's educational approach, thinking skills come to the forefront in learning and teaching processes. In this process, students are expected to participate in thinking activities such as questioning, criticising and reconstructing by using skills such as critical thinking, problem solving and creative thinking instead of taking information as it is. Asking questions represents the beginning of thinking and learning. The individual who forms a question about any subject in his/her mind takes the first step necessary for learning. Since asking questions activates thinking and enables learning to take place, the ability to ask questions is at the centre of the learning-teaching process (Büyükalan, 2007).

Learning is based on the individual's use of his/her mental abilities. In this context, the question, one of the oldest teaching and learning tools, plays an extremely important role for the learner (Ün Açıkgöz, 2005). Because the process of asking questions and seeking answers to these questions makes the thought system more effective and enables permanent and real learning to take place (Geçit and Yarar, 2010). According to Giordan (2008), asking questions is a tool that supports learning because every information is the answer to a question. Through questions, the curiosity of the student is increased and enquiry is started on the subject of curiosity. This questioning process realises learning by enabling the student to reach new information.

Permanent and meaningful learning takes place more effectively when learners are open to thinking and try to find answers to the questions they encounter. Questions, which are accepted as the most important tool of teachers in the education-training process, are one of the basic tools that enable students to think by activating their mental abilities, direct them to questioning and support learning (Çalışkan, 2011; Savaşkan, 2013). Thinking skills are a mental activity that enables conceptualising, analysing, evaluating and applying the information obtained through observation and experience in different situations. In the teaching-learning process, the student's ability to perform these activities, that is, to acquire thinking skills, constitutes the essence of the process. Therefore, students' thinking skills should be developed and thinking habits should be formed in them (Saban, 2014). Questions are one of the most basic tools that can be used effectively by both teachers and students at every stage of the teaching-learning process in order to develop students' thinking skills and gain the habit of thinking.

Questioning technique is frequently used in Turkish lessons. Question asking activities are usually carried out through texts. Since 2005, according to the constructivist approach, which has been adopted and is effective in the organisation of teaching and learning environments, texts are tools used to develop students' comprehension and expression skills. Accordingly, in order to develop

students' mental skills, it should be ensured that learning is realised through texts by performing processes such as comprehending the text, thinking multidimensionally on texts, making inferences, questioning, evaluating, etc. (Güneş, 2013). The main purpose of text analyses in the text processing process is to develop students' comprehension, expression and thinking skills. By asking questions at different levels in text analysis studies, students' skills such as problem solving, research, critical thinking, developing creativity by creating new texts are provided through texts (Karadüz, 2010). The student should not take the information given in the text as it is, he/she should understand the text and make sense of and reconstruct new information through various mental processes. This makes it necessary for the individual to be constantly active in the reading process; to examine, analyse, associate, interpret and evaluate the text by employing a number of mental processes and skills; to ask himself/herself various questions to get answers from the text and to answer these questions (Güneş, 2013). According to Göçer (2014a; 2014b), questions that help students talk about the text, understand and construct the text, reveal their level of comprehension of the text and are used before, during and after reading have an important place in the reading process. According to Akyol (2014), the purpose of reading is to understand. Questions are one of the basic tools used to develop and measure comprehension. The basic method of ensuring comprehension of the text in the text reading process is to ask questions before, during and after reading.

Bloom's Taxonomy (Kavruk and Çeçen, 2013: 2); over time, it has been criticised on the grounds that the synthesis step is a more complex process than the evaluation step, but the evaluation step is accepted as the highest step, that it is a one-dimensional classification from simple to complex, that the idea that one cannot move on to the next step without completing one step in cognitive processes is a strict rule (Bümen 2006: 4) and new classifications alternative to the taxonomy have been developed. Among these classifications, the one developed by Anderson, Krathwohl and colleagues is the one developed with the most extensive and comprehensive participation and which brought various changes and innovations to Bloom's classification (Yüksel, 2007).

Anderson, Krathwohl and colleagues worked on Bloom's original taxonomy and renewed the taxonomy in 2001. They put forward two justifications for the renewal studies. The first one is to ensure that educational stakeholders refocus on the original taxonomy since the taxonomy contains many ideas about the design, implementation and standards-based learning and assessment problems encountered in the field of education, and the second one is the need to reflect the changes and developments in education since the emergence of the original taxonomy to the taxonomy (Bümen, 2006: 4).

The steps in the original taxonomy followed a vertical order from simple to complex, from concrete to abstract, from "knowledge, comprehension, application, analysis, synthesis and evaluation" in the order of "knowledge, comprehension, application, analysis, synthesis and evaluation", with one step being a prerequisite for the more complex step above it. The taxonomy was unidimensional, that is, it contained both noun and verb forms in the category of "knowledge". While the noun form was included in the subcategories of knowledge listed above, the student was expected to remember and define the knowledge for the action form. The revised taxonomy consists of two dimensions: cognitive process and knowledge dimension. The cognitive process dimension consists of six categories as "remembering, understanding, applying, analysing, evaluating and creating" and these are expressed as actions. The knowledge dimension consists of four categories: "factual, conceptual, procedural and metacognitive knowledge". Since these two dimensions are interrelated, a two-dimensional "Taxonomy table" was created in order to use the objectives at the same time. The knowledge dimension constitutes the vertical dimension of the taxonomy and the cognitive process dimension constitutes the horizontal dimension. In this way, the knowledge dimension and cognitive process dimension can be associated in the classification of the objectives (Anderson and Krathwohl**,** 2014; Krathwohl, 2009).

It has been the primary aim of contemporary education systems to provide students with high-level thinking skills at every stage of education (Aslan, 2011). This aim is reflected in the Turkish Curriculum (Primary and Secondary School Grades 1, 2, 3, 4, 5, 6, 7 and 8). In the programme, some of the specific aims to be gained by the students are stated as developing students' research, discovery,

interpretation and structuring skills; developing their basic skills such as scientific, constructive, critical and creative thinking, problem solving; developing their skills of understanding, sorting, classifying, questioning, establishing relationships, criticising, predicting, interpreting, analysis-synthesis and evaluation. It is also stated in the programme that these skills can be gained through studies on different types of texts (MEB, 2018). As can be seen, the Turkish lesson is a lesson that offers students the opportunity to develop high-level thinking skills through texts. Considering that questions are a tool that initiates thinking, it can be said that questions formed through texts have a great share in these skills to be gained by students.

In Turkish lessons, it is important to develop students' high-level thinking skills through texts, which are "the basic tools used in gaining the skills aimed in Turkish teaching" (Sever, 2015), and to enable them to discover, produce, use and reconstruct information. Questions (Kavruk and Çeçen, 2013), which have an important place in students' structuring of knowledge and understanding of texts, are one of the most important tools and activities in creating meaning from texts, realising, developing and evaluating understanding (Akyol, 2003; 2014). In this context, the questions to be asked to the students should be functional, compatible with the purpose of teaching and should be in a way that encourages the student to think and contribute his/her development. In addition to the questions that will enable students to understand and structure the text, it is very important to ask questions that will reveal and develop their creativity, enable them to make predictions/inferences, develop their criticism, interpretation, evaluation, problem solving and decision-making skills, and enable them to see situations from different perspectives (Aslan, 2017).

Students' asking questions about any subject increases the effectiveness of the learning process and student success. Benefiting more from the positive effects of questions on learning is only possible if the student is aware of the importance of the question and knows how to produce good questions. This shows that students should be trained in asking questions and that they should be enabled to ask effective questions (Ün Açıkgöz, 2005). Research also shows that question asking skills will improve if question asking training is provided (Büyükalan Filiz, 2002; Bay, 2011; Aslan, 2011; Keray, 2012).

Students use the skills they acquire at school at every stage of their lives. The ability to ask questions, which has an important role in reading comprehension and in the acquisition and development of higher level thinking skills, is one of the basic skills that students should acquire and that students will always use. For this reason, it is obvious that in addition to enabling students to think and learn by asking them various questions, it is necessary to enable them to gain the ability to ask questions and thus to benefit from the questions more effectively. In this study, it is predicted that if students are given training on question-asking skills, they will benefit from questions more effectively at each stage of the reading process and the questions they produce will be related to each level of the cognitive process dimension of the Revised Bloom's Taxonomy, and thus they will be able to produce questions that require high-level thinking.

The aim of the research is to investigate the effect of the question-asking training given to secondary school students on the distribution of the questions that students generate in the reading process according to the stages of the reading process and the cognitive process dimension of the Renewed Bloom's Taxonomy. In this context, the main problem statement of the research is expressed as "Does the question-asking training given to secondary school students have an effect on the students' producing questions according to the stages of the reading process and the cognitive process dimension of the Revised Bloom's Taxonomy?".

In line with the problem of the research, answers to the following sub-problems are sought:

1. How is the distribution of the questions prepared by the experimental and control groups in the pre-test and post-test according to the stages of the reading process?

2. How is the distribution of the questions prepared by the experimental and control groups in the pre-test and post-test according to the cognitive process dimension of the Revised Bloom's Taxonomy?

3. How is the distribution of the questions formed by the experimental and control groups before and after the application according to the cognitive process dimension of the Revised Bloom's Taxonomy?

4. Is there a significant difference between the pre-test and post-test results of the questions formed by the experimental and control groups according to the cognitive process dimension of the Revised Bloom's Taxonomy after the question asking skill training?

Method

Research Design

In this study, a quasi-experimental model with pre-test post-test control group was used among quantitative research methods. The quasi-experimental model is a preferred research method when participants cannot be assigned to the experimental and control groups in an unbiased manner (Kaptan, 1998; Karasar, 2010). While this type of research involves the unbiased selection of groups, it does not ensure the unbiased assignment of participants to the experimental and control groups. Because it is difficult to form groups artificially in quasi-experimental studies. Therefore, the researcher has to impartially assign one group as the experimental group and the other as the control group (Clark and Creswell, 2008). The symbolic view of the quasi-experimental model used in the research is given in Table 1 below.

Table 1.
Symbolic View of the Experimental Model

Groups		Pre Test	Operation	Post Test
DG	M	O1	X	O2
KG	M	O2		O2

DG: The group in which question-asking skills are taught
KG Group taught according to the MoNE Lesson Plan
X: Experimental procedure
O1: Pre-Test
O2: Final Test
M: Unbiased Assignment of Groups

Research Group

The sample of the study consists of 5th grade students studying at Adnan A.Ş. Secondary School in Şehitkâmil district of Gaziantep province in the 2016-2017 academic year. A non-probability sampling method was used in the selection of participants. Social scientists use non-probability sampling when the population sample cannot be precisely defined or when the population sample list is not accessible (Nachimas and Nachimas, 1996). Ekiz (2013) describes non-probability sampling as a method of thoroughly describing the individuals or situations under investigation, taking into account the relationship between the population and the sample. Two equal classes selected from the students who were taught by the researcher in the 2016-2017 academic year and whose primary school grade point average was between 90-100 were determined as the sample. In the study, there were a total of 29 students, 11 girls and 18 boys in the experimental group, and a total of 29 students, 15 girls and 14 boys in the control group. Thus, a total of 58 students were included in the study.

Data Collection Tool

Firstly, the text titled 'Garbage House' was selected for the purpose of the study in line with the expert opinions from the MEB Publications approved by the MEB Board of Education and Discipline and used as a textbook in the 5th grades in the past years. Two Turkish language teachers, two field experts and one measurement and evaluation expert who have master's degrees were consulted about the suitability of the texts to the student levels and the questions related to the reading process and the cognitive process dimension of the Revised Bloom's Taxonomy. A question preparation form was prepared by the researcher for the students to prepare questions for the selected "Rubbish House"

text. The form covers three different reading processes: before reading, during reading, and after reading. In addition, the form includes sections aimed at creating questions related to cognitive processes such as memory, comprehension, analysis, evaluation, and creation. This form was used as the data collection tool of the research.

Data Collection

The realisation of the research was completed in three stages: the application of the pre-test, the questioning training and the application of the post-test. Document analysis was used to collect the data. Document analysis involves the examination of written materials that provide information about the phenomena and facts that are the subject of the research (Yıldırım and Şimşek, 2013). The implementation process of the research was planned as 4 weeks and 16 hours in total. The pre-test and post-test were administered before and after the training, each for two lesson hours. The implementation process of the research is given in Table 2 below.

Table 2.
Implementation Process of the Research

Weeks	Date	Course Hours	Application
Week 1	25.04.2017	2 lessons	A pre-test was applied.
Week 2	02-05.05.2017	4 lessons	Theoretical information was given about the questions.
Week 3	08.05.2017-12.05.2017	4 lessons	Question studies were carried out for the text "Uçurtma".
Week 4	15.05.2017- 19.05.2017	4 lessons	Questions about the text "Gökyüzünde Beliren Tuhaflık" were practised.
Week 5	22.05.2017- 26.05.2017	4 lessons	Question studies were carried out for the text titled "Para Cüzdanı".
Week 6	29.05.2017	2 lessons	The last test was applied.

Analysing the Data

In order to determine the distribution of the questions prepared by the experimental and control groups in the pre-test and post-test according to the stages of the reading process and the steps of the cognitive process dimension of the Revised Bloom's Taxonomy, content analysis was first performed to analyse the data. In content analysis, similar data are organised within the framework of various concepts and themes (Yıldırım and Şimşek, 2013). The pre-test and post-test data collected through document analysis were subjected to content analysis. The data obtained during the research process were quantified and comparisons were made between the themes and categories that emerged.

While the questions prepared by the students were classified according to the stages of the reading process, the questions asked before reading were coded as 1, the questions asked during reading were coded as 2, and the questions asked after reading were coded as 3. In the analysis made according to the cognitive process dimension of the Revised Bloom's Taxonomy, the questions entering the recall stage were coded as 1, the questions entering the comprehension stage as 2, the questions entering the application stage as 3, the questions entering the analysis stage as 4, the questions entering the evaluation stage as 5, and the questions entering the creation stage as 6.

The data obtained from the pre-test and post-test were analysed according to the stages of the reading process and the cognitive process dimension of the Revised Bloom's Taxonomy simultaneously by the researcher and two Turkish language teachers studying at doctoral level. The measurement and evaluation expert was consulted on the issues that could not be agreed upon. During the classification, expressions that did not carry meaning in terms of language and expression and repetitive questions expressed in different ways were not taken into consideration.

After the questions prepared by the students were classified according to the stages of the reading process and the steps of the cognitive process dimension of Bloom's Taxonomy, the

frequencies (f) and percentages (%) of the questions included in the classification were calculated and interpreted. In order to determine the differences in the cognitive process dimension of the Renewed Bloom's Taxonomy before and after the training, the analysis of the questions was carried out using the SPSS 25 programme.

Since the data obtained according to the cognitive process dimension of the Revised Bloom's Taxonomy are continuous variables and for the pre-test post-test design, it is appropriate to apply the paired t-test in analysing the data (Büyüköztürk, 2007; Can, 2014). However, in the content analysis, determined that the data did not show a normal distribution and while there was an accumulation in some categories, no questions were produced in some categories. In order to ensure this, the normality of the data was also examined with the Kolmogorov-Smirnov test and it was determined that the distribution did not show normality for all categories. Due to the fact that the data did not show normal distribution, the nonparametric "Wilcoxon Signed Ranks Test", which is preferred instead of the paired t-test in cases where the difference scores do not show normal distribution, was used in the analysis (Field, 2005; Oğuzlar, 2007).

Validity and Reliability

The question preparation form, which is the data collection tool used in the study, was structured on the text "Rubbish House", which was approved by the Ministry of National Education (MEB) and used as a textbook in the past years. In order to ensure the content validity of the form, the opinions of two Turkish language teachers, two educational scientists and one measurement and evaluation expert were consulted; criteria such as the suitability of the form to the level of the students, the ability to form questions for the stages of the reading process and the ability to evaluate according to the cognitive process dimension of the Revised Bloom's Taxonomy were taken as basis. The content validity of the form was ensured by making the necessary arrangements in line with the expert opinions.

In order to increase the reliability of the data, the questions formed by the students in the pre-test and post-test were analysed by three independent experts (the researcher and two Turkish teachers with doctoral level education). For the cases that could not be agreed upon during the analysis process, a final decision was made by taking the opinion of a measurement and evaluation expert. This process was carried out in order to increase coding reliability and minimise interpretation differences. In addition, the implementation plan and data collection stages used during the research were carried out systematically, and the equivalence of the pre-test and post-test conditions was taken into consideration. The analysis techniques such as content analysis and Wilcoxon Signed Rank Test used in the analysis of the data were selected in accordance with the data structure; the consistency of the findings obtained throughout the analysis process was ensured. In line with the results of the normality test (Kolmogorov-Smirnov), the preference of nonparametric tests was considered as a proper decision in terms of statistical validity.

All these processes were structured and reported in order to ensure both internal validity and reliability of the study.

Research and Publication Ethics

In this study, all rules specified in the "Directive on Scientific Research and Publication Ethics of Higher Education Institutions" were followed. None of the actions specified under the second section of the Directive, "Actions Contrary to Scientific Research and Publication Ethics", have been carried out.

Ethics Committee Approval

Ethical committee approval was not required, as the study was conducted prior to 2020.

Findings

The distribution of the questions formed by the experimental and control group students in the pre-test according to the stages of the reading process is given in Table 3 below.

Table 3.
Distribution of the Questions Formed by the Experimental and Control Group Students in the Pre-test According to the Stages of the Reading Process

		Before Reading	Reading Order	After Reading	Total
Experimental Group Pre-test	f	0	1	609	610
	%	0	0,17	99,83	100
Control Group Pre-test	f	0	0	858	858
	%	0	0	100	100

As seen in Table 3, the number of questions formed by the experimental group in the pre-test is 610. When the distribution of the questions formed by the experimental group students in the pre-test about the text reading process according to the text reading processes is analysed, it is seen that 99,83% (609) of the questions were asked after the text was read, only one question was asked during the reading of the text, and no questions about the text were asked before reading the text. The number of questions formed by the control group in the pre-test is 858. When we look at the distribution of the questions formed by the control group students in the pre-test about the text reading process, it is seen that all of the questions (100%) were asked after reading the text. The control group did not form any questions about the text before and during text reading. When the number and percentages of the questions formed by the experimental and control groups in the pre-test are analysed, it is seen that neither group asked any questions about the text before reading. During the reading, only one question was included in the experimental group, while the control group did not include any question asked during reading; it is seen that the experimental group formed almost all of the questions about the text, while the control group formed all of them after reading the text.

The distribution of the questions formed by the experimental and control group students in the post-test according to the stages of the text reading process is given in Table 4.

Table 4.
Distribution of the Questions Formed by the Experimental and Control Group Students in the Post-test According to the Stages of the Reading Process

		Before Reading	Reading Order	After Reading	Total
Experimental Group Post-test	f	46	19	718	783
	%	5,87	2,42	91,70	100
Control Group Post-test	f	0	0	741	741
	%	0	0	100	100

According to Table 4, the number of questions formed by the experimental group in the post-test is 783. When we look at at which stage the students asked the questions, it is seen that 5,87% of the questions were asked before reading the text, 2,42% of the questions were asked during reading the text and 91,70% of the questions were asked after reading the text. The number of questions formed by the control group in the post-test was 741; when we look at the stage at which the questions were formed, it is seen that all of the questions (100%) were asked after reading the text, and no questions were formed for understanding the text before and during reading the text.

The distribution of the questions formed by the control group students in the pre-test and post-test according to the stages of the reading process is given in Table 5 below.

Table 5.
Distribution of the Questions Formed by the Control Group Students in the Pre-test and Post-test According to the Stages of the Reading Process

		Before Reading	Reading Order	After Reading	Total
Control Group Pre-test	f	0	0	858	858
	%	0	0	100	100
Control Group Post-test	f	0	0	741	741
	%	0	0	100	100

According to Table 5, all of the questions asked by the control group in the pre-test (100%) were formed after reading the text. All of the questions asked by the control group in the post-test were formed after reading the text. The control group students did not ask any questions about the text both in the pre-test and post-test before and during reading the text.

The distribution of the questions formed by the experimental group students in the pre-test and post-test according to the stages of the reading process is given in Table 6.

Table 6.
Distribution of the Questions Formed by the Experimental Group Students in the Pre-test and Post-test According to the Stages of the Reading Process

		Before Reading	Reading Order	After Reading	Total
Experimental Group Pre-test	f	0	1	609	610
	%	0	0,17	99,83	100
Experimental Group Post-test	f	46	19	718	783
	%	5,87	2,42	91,70	100

When Table 6 is analysed, it is seen that the experimental group students did not ask any questions before reading the text in the pre-test, and only one question was asked during the reading, and 609 of the 610 questions (99.83%) were asked after reading the text. In the post-test of the experimental group, it was observed that the rate of questions asked after the text was read decreased, while the rate of questions asked before and during reading increased. Accordingly, in the pre-test, no questions were asked before reading the text, but 46 questions were asked in the post-test. In the pre-test, only 1 question was asked during reading, while 19 questions were asked in the post-test. In terms of the number of questions, 609 questions were asked after reading in the pre-test and 718 questions were asked in the post-test. In the post-test, the number of questions asked after reading was higher. However, when the percentage calculations are analysed, it is seen that while 99.83% of the questions in the pre-test were asked after reading, this rate decreased to 91.70% in the post-test. In the pre-test of the experimental group, the rate of questions asked before reading, which was 0%, increased to 5.87% in the post-test, and the rate of questions asked during reading, which was 0.17%, increased to 2.42%.

The distribution of the questions formed by the experimental and control group students in the pre-test and post-test according to the cognitive process dimension of the Revised Bloom's Taxonomy is given in Table 7.

Table 7.
The Distribution of the Questions Formed by the Experimental and Control Group Students in the Pre-test and Post-test According to the Cognitive Process Dimension of the Revised Bloom's Taxonomy

		Recall	Understanding	Application	Analysing	Evaluation	Creation	Total
Experimental	f	573	18	0	19	0	0	610
Group Pre-test	%	93,93	2,95	0	3,11	0	0	100

Experimental Group Post-test	f	490	200	0	46	29	18	783
	%	62.57	25,54	0	5,87	3,70	2,29	100
Control Group Pre-test	f	773	49	0	35	1	0	858
	%	90,10	5,71	0	4,07	0,11	0	100
Control Group Post-test	f	678	40	0	23	0	0	741
	%	91,50	5,40	0	3,10	0	0	100

According to Table 7, the number of questions formed by the experimental group in the pre-test was 610. Almost all of the questions are in the first step of the taxonomy, recall (93,93%). Of the remaining questions, 2.95% were at the comprehension and 3.11% at the analysing level. In the table, it is seen that almost all of the questions formed by the experimental group in the pre-test were in the recall stage of the Revised Bloom's Taxonomy, and a few of them were in the comprehension and analysis stages; there were no questions related to the application, evaluation and creation stages among the prepared questions. When the post-test of the experimental group is examined, it is seen that the number of questions created is 783. Although the number of questions formed by the experimental group in the post-test is higher than the number of questions formed in the pre-test , a difference is also observed in the distribution of the questions according to the steps in the cognitive process dimension of the taxonomy. In the post-test, 62,57% of the questions were in the recall, 25,54% in the comprehension, 5,87% in the analysis, 3,70% in the evaluation and 2,29% in the creation step. In the pre-test of the experimental group, it was observed that the majority of the questions were clustered in the recall stage, but this clustering decreased in the post-test. Accordingly, while the rate of recall step was 93.93% in the pre-test, this rate decreased to 62.57% in the post-test. In addition, it is among the findings given in the table that while there were no questions in the evaluation and creation steps in the pre-test, there were 3,70% questions in the evaluation step and 2,29% questions in the creation step in the post-test. In both the pre-test and post-test of the experimental group, there were no questions in the application step.

When Table 7 is examined, it is seen that the number of questions formed by the control group in the pre-test was 858 and almost all of the questions formed were in the recall (90,10%) step of the Revised Bloom's Taxonomy. Of the remaining questions, 5,71% were at the comprehension, 4,07% at the analysing and 0,11% at the evaluation level. Only one question was asked in the evaluation step. The control group did not form any questions in the application and creation step in the pre-test. The number of questions formed by the control group in the post-test was 741. It is seen that the number of questions asked in the post-test decreased compared to the number of questions asked in the pre-test. When the distribution of 741 questions according to the cognitive process levels of the Revised Bloom's Taxonomy is examined, it is seen that 91,50% of the questions are at the recall, 5,40% at the comprehension, and 3,10% at the analysing level. In the post-test of the control group, there were no questions at the application, evaluation and creation levels.

Before the measurement of the differences assumed to have occurred between the experimental and control groups, the categories of the question types produced by the students in the two groups in the cognitive process dimension of the Revised Bloom's Taxonomy are presented in Table 8 and Table 9, where the raw data are presented.

Table 8.

Distribution of the Questions Formed by the Experimental and Control Groups Before the Application According to the Cognitive Process Dimension of the Revised Bloom's Taxonomy

Groups		Recall	Understanding	Application	Analysing	Evaluation	Creation
Experimental Group	N	29	29	29	29	29	29
	Av.	19.758	.586	.000	.66	.000	.000
	Sd.	10.598	.779	.000	.857	.000	.000

Control Group	N	29	29	29	29	29	29
	Av.	26.655	1.689	.000	1.21	.034	.000
	Sd.	14.278	2.346	.000	.861	.185	.000
Total	N	58	58	58	58	58	58
	Av.	23.206	1.137	.000	.93	.0172	.000
	Sd.	12.939	1.820	.000	.896	.131	.000

When Table 8 is analysed, it is seen that there was no significant difference between the experimental and control groups before the application. When the questions produced by the students are classified according to the cognitive process dimension of the Revised Bloom's Taxonomy, it is seen that both groups produced the most questions at the recall stage in the pre-test; neither group produced any questions at the application and creation stages; the experimental group did not produce any questions at the evaluation stage, while the control group produced almost none.

Table 9.

Distribution of the Questions Formed by the Experimental and Control Groups after the Application According to the Cognitive Process Dimension of the Revised Bloom's Taxonomy

Groups		Recall	Understanding	Application	Analysing	Evaluation	Creation
Experimental Group	N	29	29	29	29	29	29
	Av.	16.896	6.896	.000	1.586	1.000	.620
	Sd.	11.465	3.912	.000	1.500	1.253	1.207
Control Group	N	29	29	29	29	29	29
	Av.	23.379	1.379	.000	.793	.000	.000
	Sd.	10.7484	1.801	.000	1.372	.000	.000
Total	N	58	58	58	58	58	58
	Av.	20.137	4.137	.000	1.189	.500	.310
	Sd.	11.489	4.105	.000	1.48036	1.013	.902

When Table 9 is analysed, it can be seen that when the questions produced by the students are classified according to the cognitive process dimension of the Revised Bloom's Taxonomy, some differences are observed between the experimental and control groups after the application. It is seen that both groups did not produce any questions at the application level. While the control group did not produce any questions at the evaluation and creation levels, the experimental group produced questions at these levels.

The pre-test and post-test comparisons of the control group were statistically analysed and presented in Table 10.

Table 10.

Wilcoxon Analysis Results to Determine Whether There is a Difference Between Control Group Pre-test and Post-test Scores

Points	Groups	N	$\bar{x}_{sira}$	$\sum_{sira}$	z	p
Recall	Decreasing	16	17.44	279.00	-1.332	.183
	Increases	13	12.00	156.00		
	Equal	0				
	Total	29				
Understanding	Decreasing	9	10.11	91.00	-.693	.488
	Increases	8	7.75	62.00		
	Equal	12				
	Total	29				

Application	Decreasing	0	.00	.00	.000	1.000
	Increases	0	.00	.00		
	Equal	29				
	Total	29				
Analysing	Decreasing	15	11.60	174.00	-1.583	.113
	Increases	7	11.29	79.00		
	Equal	7				
	Total	29				
Evaluation	Decreasing	1	1.00	1.00	-1.000	.317
	Increases	0	.00	.00		
	Equal	28				
	Total	29				
Creation	Decreasing	0	.00	.00	.000	1.000
	Increases	0	.00	.00		
	Equal	29				
	Total	29				

When Table 10 is analysed, it is seen that there is a statistical difference between the pre-test and post-test applications of the control group at the level of recall (z= -1.332; p > .05), comprehension (z= -.693; p > .05), application (z= .000; p > .05), analysis (z= -1.583; p > .05), evaluation (z= -1.000; p > .05) and creation (z= .000; p > .05).05), analysing level (z= -1.583; p > .05), evaluating level (z= -1.000; p > .05) and creating level (z= .000; p > .05). All probability values presented in the table are greater than .05, which is accepted as the critical value in social sciences, indicating that there is no significant difference between the pre-test and post-test applications (p > .05).

The pre-test and post-test comparisons of the experimental group were statistically analysed and presented in Table 11.

Table 11.
Wilcoxon Analysis Results to Determine Whether There is a Difference Between Experimental Group Pre-test and Post-test Scores

Points	Groups	N	$\bar{x}_{sira}$	$\sum_{sira}$	z	p
Recall	Decreasing	19	14.13	268.50	-1.493	.136
	Increases	9	15.28	137.50		
	Equal	1				
	Total	29				
Understanding	Decreasing	0	.00	.00	-4.633	.000
	Increases	28	14.50	406.00		
	Equal	1				
	Total	29				
Application	Decreasing	0	.00	.00	.000	1.000
	Increases	0	.00	.00		
	Equal	29				
	Total	29				
Analysing	Decreasing	6	6.83	41.00	-2.617	.009
	Increases	15	12.67	190.00		
	Equal	8				
	Total	29				
Evaluation	Decreasing	0	.00	.00	-3.594	.000
	Increases	16	8.50	136.00		
	Equal	13				

	Total	29				
Creation	Decreasing	0	.00	.00	-2.555	.011
	Increases	8	4.50	36.00		
	Equal	21				
	Total	29				

When Table 11 is analysed, pre-test and post-test scores of the experimental group contain statistically significant differences except for recall and application levels. No statistically significant differences were observed at the recall ($z=-1.493$; $p>.05$) and application ($z= .000$; $p>.05$) levels. Considering the differences between the pre-test and post-test, it is understood that the changes in the scores of the experimental group were statistically significant at the comprehension level ($z=-4.633$; $p<.05$), analysis level ($z=-2.617$; $p<.05$), evaluation level ($z=-3.594$; $p<.05$) and creation level ($z=-2.555$; $p<.05$).

As a result of the statistical calculations, it was seen that there were significant differences between the pre-test and post-test data of the experimental group at the comprehension, analysing, evaluating and creating levels. The effect sizes of these significant differences should also be calculated (Büyüköztürk, 2007; Oğuzlar, 2007). As a result of the calculations, it was found that the effect size for the comprehension level was $r=-0.196$, the effect size for the analysing level was $r=-0.343$, the effect size for the evaluating level was $r=-0.471$, and the effect size for the creating level was $r=-0.335$. These effect values can be considered below the medium level. In the related literature, it is argued that only values of 0.5 and higher can have a large effect level (Can, 2014; Field, 2005).

Discussion and Conclusion

When the student questions are analysed according to the stages of the reading process, it is seen that the control and experimental group students mostly generated questions about understanding the text after reading. Students in the control group generated all of their questions (100%) both in the pre-test and post-test after reading. While the students in the experimental group asked 99.83% of their questions after reading in the pre-test, this rate decreased in the post-test; 8.87% of them asked questions before reading and 2.42% of them asked questions during reading. This shows that the training encouraged thinking with questions at all stages of the reading process and that the students gained this awareness.

In order for the act of reading to achieve its purpose, the reading process should be handled as a whole. In the pre-reading period, cognitive activities such as setting goals, mobilising prior knowledge and preparing the mind for the text; during reading, cognitive activities such as controlling predictions, developing new predictions and establishing relationships between text fragments are critical. In each of these processes, students' thinking with questions increases text comprehension success. Studies in the literature (Adams, 2007; Akyol, 2014; Üstün, 2013) also support this view. In this study, the experimental group students started to ask questions not only after reading but also before and during reading.

The experimental group students formed most of their questions in the post-test after reading. This is an acceptable situation because the student must first read the text completely in order to think deeply about the text. The fact that most of the questions in textbooks and teacher's guides are also found after the text (Arap, 2015; Şengül, 2005) supports this situation. However, the important thing is to gain the habit of utilising questions at every stage of the reading process. As a result of this study, it was revealed that education is effective in this regard.

In the evaluation made according to the cognitive process dimension of the Revised Bloom's Taxonomy, most of the questions of the control and experimental group students remained at the level of recall and comprehension. This situation also coincides with previous studies (Aslan, 2011; Erdoğan, 2017; Keray, 2012). However, in the process of understanding the text, students' ability to produce questions at every step of the cognitive process enables them to both understand the text better and develop higher-order thinking skills.

Especially due to the structure of story texts, students produced more recall level questions to determine the text elements (Eyüp, 2012). This situation is insufficient for a course that aims to develop critical and creative thinking such as Turkish lesson. In order for the Turkish lesson to reach its goals, it is important that students can create questions that develop high-level cognitive skills such as analysing, evaluating and producing.

There were no questions at the application step in the tests of both groups. This situation was also observed in previous studies (Bay, 2011; Erdoğan, 2017). However, in the post-test results of the experimental group, significant increases were found in the comprehension, analysing, evaluating and creating levels. This increase shows that the applied training enabled the students to perform deeper mental operations.

In the experimental group, the rate of questions at the recall level decreased from 93.93% to 62.57%, whereas the rate of questions at the comprehension level increased from 2.95% to 25.54%. This shows that students not only remembered the information but also started to interpret it. However, this development is considered to be limited since both levels are in the lower level thinking category.

What is more remarkable is the increase in the rate of questions requiring higher level thinking. In the pre-test of the experimental group, only 3.11% of the questions were at the analysing level, while this rate increased to 5.87% in the post-test. In addition, 3.7% and 2.29% questions were produced at the evaluation and creation levels, respectively. These results clearly reveal the effect of question asking training on the development of students' higher order thinking skills. This finding also coincides with the results of studies such as Bay (2011), Aslan (2011) and Keray (2012).

It was determined that when students were provided with the ability to ask questions, they were able to use this skill at every stage of the reading process and to understand the text more deeply. This shows that question-asking training is effective in increasing students' cognitive development, especially their critical and creative thinking skills.

In line with the results obtained from the research, various suggestions were presented:

- Question asking trainings for different question classifications can be given and their effects on students can be analysed.
- The reading comprehension levels of the students who ask questions at every stage of the reading process can be compared with the students who ask questions only after reading.
- The difference between the reading comprehension levels of the students who can ask questions only at the lower level steps of the Revised Bloom's Taxonomy and the students who can ask questions at all levels, especially at the higher level steps, can be compared.
- The level of the questions formed by the students can be compared with the written exam questions asked during an academic year.
- Considering that question-asking skill training is effective on students' utilising questions at every stage of reading processes and forming questions at different levels, similar and different trainings can be applied improve students' question-asking skills.

Research and Publication

In this study, all rules specified in the "Directive on Scientific Research and Publication Ethics of Higher Education Institutions" were followed. None of the actions specified under the second section of the Directive, "Actions Contrary to Scientific Research and Publication Ethics", have been carried out.

Ethics Committee Approval

Ethical committee approval was not required, as the study was conducted prior to 2020.

Contribution Rate of Authors

The researchers who conducted the study contributed equally (1st author 50%, 2nd author 50%).

Conflict of Interest

There is no conflict of interest.

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