Eliminating student misconceptions regarding the unit, Adventure of Democracy, in sixth grade social studies lessons

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Misconceptions are judgments formed in the mind of an individual about a concept that contradicts scientific principles. Identifying and correcting existing misconceptions in students' minds is an important part of education. To help students properly grasp the concepts covered in the curriculum, any existing misconceptions should be identified and eliminated first, which will ensure that they will better learn the concepts that they encounter in the future. Adopting an action research design, we aimed to examine whether the misconceptions of 6th grade students regarding the study unit, The Adventure of Democracy, have been resolved. The study group consisted of 24 students in classes 6/A and 6/B at the Havuz Secondary School in the Kangal district of the Sivas province of Turkey in the 2017/2018 academic year. Certain methods were used to produce activities aimed at teaching concepts and eliminating misconceptions – audio recordings and field notes were used as the data collection tools. The data were analysed through descriptive analysis. The analysis revealed that the action research activities were effective in teaching the targeted concepts and eliminating the misconceptions held by students.

Keywords: action research; concept teaching; misconceptions; social studies; the adventure of democracy

Introduction

People encounter various objects that they want to identify and name throughout their lives. These actions are performed directly or indirectly. Based on our life experiences, we group two or more entities together according to their common characteristics, distinguish them from other entities and store them as a unit of thought in our minds. These units of thought are called concepts (Çepni, 2006).

Mislearning or misinterpretation of the concepts that form the basis of scientific knowledge leads to conceptual confusion and misconceptions, causing the learned knowledge not to be used or even to be misused. Misconceptions obscure accurate concepts about an event or phenomenon, so they are quite dangerous. It is much better to have no understanding and knowledge about a subject than to have a misconception about it, because it is very difficult to correct the misconceptions later. Therefore, it is important to teach concepts correctly (Bitlisli, 2014). There is no single reason for misconceptions. Factors leading to misunderstanding may stem from teachers, students and textbooks (Yılmaz, Ö 1998), as well as students' lack of learning motivation or prejudice against a subject.

According to Grösser (2007:38), "[an] important role of the teacher in developing certain learning functions [is] to assist the learner in the learning process and in the optimal realisation of learning outcomes. These learning functions refer to the following: how to link new information to prior knowledge, how to organize information, and how to acquire cognitive and metacognitive learning functions."

The most important factor in misconceptions arising from a teacher is that the teacher tries to teach more than one concept at the same time and does not exactly know the concept he/she is aiming to teach (Lawson, 1995, cited in Demirci, 2003). In addition, misconceptions may occur if many problems are solved in a uniform way or if students are not given enough time to think while solving them. It is important to identify students' misconceptions and eliminate them, since learning wrong concepts will lead to the formation of misconceptions in the future. Concept teaching has an important place in the social studies curriculum, which, due to the content of the curriculum, includes many concepts. In teaching concepts, classifications and different concept teaching approaches should be taken into account. Certain methods should be used for eliminating ambiguity, conceptual confusion and misconceptions.

The main methods used in teaching concepts and eliminating misconceptions are shown in Table 1 (Çelikkaya, 2018):

Table 1 Concept teaching, methods used in the detection and elimination of misconceptions

1)	Concept map	7)	Conceptual change texts
2)	Analogies	8)	Concept cartoons
3)	Meaning analysis tables	9)	Word association
4)	Concept webs	10)	Metaphors
5)	Concept puzzles	11)	Structured grid
6)	Concept analysis cards		

In order for students to learn the principles of social studies and to solve social problems, they need to acquire basic concepts very well. Concept teaching in social studies gained importance with the conceptual approach, especially in the 1960s and 1970s. During this period, academics conducted research to reveal the basic concepts of social sciences in order to facilitate the teaching of social studies (Erden, 1999).

Concept teaching in social studies provides high-level academic success, simplifies learning and remembering, facilitates communication, helps to distinguish between true and false perceptions by personalising teaching, facilitates problem-solving and reasoning by helping to understand complex events (Doğanay, 2005).

Literature Review

Various studies (Göncüoğlu, 2010; Yesari, 2018; Zıngal, 2015) have been conducted on the level of student success regarding the unit, Adventure of Democracy (hereafter, the unit). In all of these studies, the effect of certain teaching techniques on student achievement has been examined, and the experimental group was found to be more successful than the control group.

In a study conducted by Selcuk, Altintas and Ciritci (2015), sixth grade students were asked to create animal metaphors related to the concepts of constitutionalism, secularism, monarchy, oligarchy, freedom and executive. In a study by K Yılmaz (2013), it was aimed to reveal the perceptions of eighth grade students about the concepts of responsibility, rights, equality, citizenship and sovereignty. In a study by Akgün (2015), it was aimed to determine the level of the realisation of the five acquisitions aimed at students in the unit, Adventure of Democracy, in terms of various variables. Regarding the concepts discussed in this study in the international literature, a study by Onwe and Nwogbaga (2015) on the concept of sovereignty, "Conceptual issues and theoretical analysis of sovereignty", was designed to examine the various perceptions and interpretations of the concept, especially regarding the sources, location, and essence. Since the unit was included in the social studies curriculum in Turkey, no study or action research has been found in international literature regarding the elimination of misconceptions in the unit.

With this study, various activity plans were developed and implemented to eliminate the misconceptions related to the unit and to ensure that the students and the teacher participating in the research achieved various outcomes. As such, the study was expected to make a significant contribution to the related literature.

Aim of the Study

The main purpose of this study was to examine whether sixth grade students' misconceptions were eliminated by conducting action research in the social studies lessons taught through various activities based on concept teaching related to 10 concepts in the unit. For this purpose, answers to the following questions were sought:

Regarding the concepts of *republic, democracy, sovereignty, constitutional monarchy, monarchy, oligarchy, theocracy, judiciary, legislature* and *executive,*

- are there any existing misconceptions held by the students?
- what kinds of activities can be prepared and how can these activities be implemented?
- to what extent have the misconceptions been eliminated?

Method

In this section, detailed explanations are presented.

Research Design

The students' level of understanding of the concepts in the unit was revealed and the misconceptions they had were identified. Various activities to eliminate these misconceptions were developed, implemented, and evaluated.

The action research design, which best fit the nature of the inquiry, was used because teaching practices were developed and the problem was identified and eliminated in its natural environment, in which the primary researcher acted as a guide. According to Johnson (2014), action research is closer to qualitative research because action researchers do not shape the environment to isolate variables.

The feature that distinguishes action research from other types of research is that it fills the gap between theory and practice by taking a snapshot of an existing problem and its solution as a whole by ensuring that research results are directly reflected in practice. In this respect, action research is a research approach in which participation, reflection and development processes are productively employed (Yıldırım & Şimşek, 2016).

"Action research can be carried out in four steps: determining the area to focus on, collecting data, analyzing and interpreting data, and developing an action plan" (Mills, 2003:18). In action research, it is important to realise social change by ensuring the development of individuals by collaborating (Aksoy, 2003). Action research was preferred for this study for the reasons stated above.

The research process was two-dimensional, including the explanation of the subjects and conducting activities to ensure students' accurate understanding of the concepts to achieve the

targeted learning outcomes of the course. The subjects and concepts were associated according to the achievements before the application. Which

week and which subjects and concepts would be covered was planned before the research. (cf. Table 2).

Table 2 Weekly action plans

Weeks	Concepts	Methods used
Week 1	Republic	Lesson 1: Word association test (WAT)
	Monarchy	Lesson 2: Concept map
	Oligarchy	Lesson 3: Concept web, MAT, WAT
	Theocracy	
Week 2	Democracy	Lesson 1: WAT
		Lesson 2: Concept map
		Lesson 3: Structured grid, worksheet, WAT
Week 3	Sovereignty	Lesson 1: WAT
		Lesson 2: Conceptual change text (CCT)
		Lesson 3: WAT
Week 4	Constitutional monarchy	Lesson 1: WAT
		Lesson 2: CCT
		Lesson 3: WAT
Week 5	Legislature	Lesson 1: WAT
	Executive	Lesson 2: CCT
	Judiciary	Lesson 3: WAT
Week 6	All concepts	Concept puzzle for all concepts

The implementation started in the second week of March 2018 and was completed in the fourth week of April 2018. While teaching the concepts,

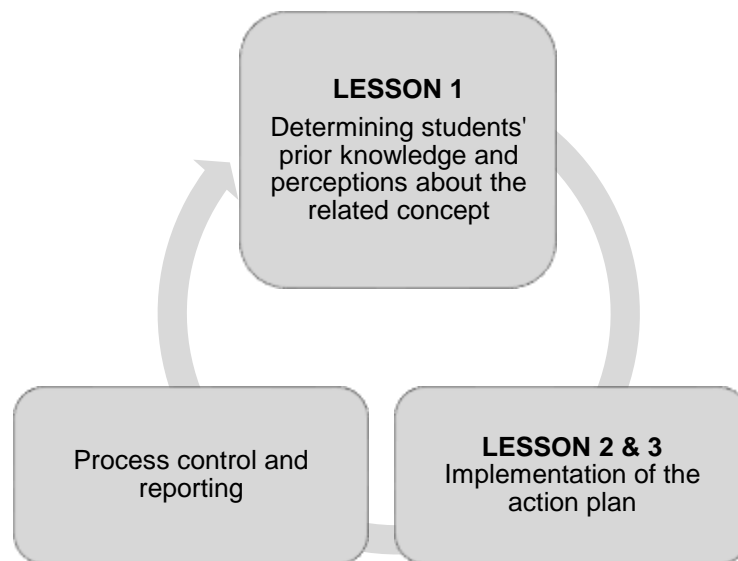the curricular order of the targeted outcomes was taken into consideration.

Figure 1 Weekly research cycle

As seen in Figure 1, we determined the students' overall prior knowledge and perceptions (initial situation) about the related concept in the first lesson. Based on this, the action activities were created and applied in the second and third lessons. At the end of the third lesson, after the action activities, the data generation tool (final assessment) applied in the first lesson was applied again. We evaluated the final assessment by taking the sample criterion that we created for the related concept into account.

Participants

After having determined the subject and purpose of the research, the school and classroom where the research was to be conducted, were determined. Since this research was backyard research (the researcher's own workplace, etc.), Havuz Secondary School (pseudonym), where the primary researcher worked, was chosen as research setting.

After having determined the research setting, we initiated the official procedures for obtaining permission for the research from the Ministry of

National Education (MoNE). The necessary permissions were obtained on 28 March 2018. After having secured the permission, the students and parents were informed about the research. Due to parents not consenting and issues with transport required for the students, only 24 of a total of 41 students in the 6 A/B classes at Havuz Secondary School were included in the study. The researcher had been teaching these classes for 2 years. In line with research ethics and to ensure the participants' anonymity, pseudonyms (for example: Damla, İrem, & Mustafa) were used to refer to each participant instead of using their real names.

Research Setting

The environment in which the research took place was one of the factors affecting the results. Havuz Secondary School consists of a three-storey building. The ground floor included the library and kindergarten, the first floor a science laboratory, and the second floor housed the primary school as well as the first, second, third, and fourth grades, the informatics classroom, the teachers' room and the assistant principal's room. The fifth, sixth, seventh and eighth grades of the secondary school, as well as the principal's room and an instructional support classroom were located on the third floor.

The Role of the Practitioner Researcher

Yıldırım and Şimşek (2016:308) added a different type to the existing classification of action research as "the practitioner who collects the data related to the problem s/he determined while continuing the application is also a researcher." In this study the practitioner (I) assumed the role of researcher-teacher and carried out the planning and implementation of the research process and data collection under guidance of my supervisor. At the time of the study, I had been working at the participating school for 3 years, had 3 years' professional experience, and had taken courses on qualitative research during my graduate education.

Data Collection Instrument

It was determined that understanding the basic concepts expected to be achieved in the unit in the social studies curriculum were not clearly stated, and the number of concepts specified at the beginning of the unit in the social studies textbooks varied between 20 and 26 – depending on the publisher. Since it would be difficult to study all of these concepts within the scope of the study, I decided to include 10 concepts based on the answers given by the students in the preliminary study.

In the research, data were produced about four concepts in the first week, three concepts in the fifth week, and one concept in the other weeks. Each lesson hour was audio recorded and field notes were created.

Johnson (2014) states that there are many types of data and many different methods of collecting these in qualitative research. The important thing when determining data generation tools is to use the methods that best suit the research question and teaching context. The tools used to generate data in this research are grouped under three headings:

1) Data generation tools used to determine the knowledge status: The word association test (WAT) was prepared to determine the students' prior knowledge and post-lesson knowledge. The WAT was implemented between the second and sixth weeks. It was given at the beginning and at the end of the lessons.

2) Data generation tools used to teach concepts: Techniques such as concept maps, CCTs, concept puzzles, structured grids, meaning analysis tables, and concept webs were used to eliminate misconceptions during the research process.

   - Concept maps help to present the subject as a whole by adding visuality to the subject. Within the scope of our study, concept maps were used to reinforce the concepts given in the second and third weeks of the research.

   - During the research, it became clear that the students confused some concepts, and thus CCTs were prepared for the related concepts. These CCTs were given in the fourth, fifth and sixth weeks. While preparing the CCTs, a text of at least half a page was created based on the dictionary definitions and analyses of the concepts used interchangeably by the students, and sometimes these texts were supported by visuals.

   - Meaning analysis tables (MAT) can be used effectively in learning the descriptive and distinctive features of concepts. While preparing this tool, the student connects the meanings of the words they had learnt to the words they already knew, thus developing the concept. A puzzle activity was used in the second week of this research.

   - Since it included many topics related to the subject, a structured grid was used in the third week.

   - Concept webs were used in the second week of the research – to gain a general review of the subject, to recall the lesson, to activate the students' prior knowledge, and to develop relationships between the concepts and the scope of the concepts.

   - Concept puzzles, used in the seventh week of the research, were important for the general review of the subject.

3) Data generation tools to support and understand the overall process: Field notes and concept achievement test were used for this. Field notes are transcriptions of what is observed during the implementation. Field notes can be of three types: intensive descriptions during instruction, short notes during instruction, and notes and reflections after instruction (Johnson, 2014). Post-instruction reflection was used in this study. I mostly recorded my post-instruction observations in a diary. These field notes were kept

as a tool to increase the reliability of the research.

To determine any misconceptions about the concepts, "republic, democracy, sovereignty, secularism, constitutional monarchy, national sovereignty, monarchy, oligarchy, sultanate, theocracy, judiciary, legislature", and "executive" in the unit in the sixth grade social studies curriculum, 247 students in five secondary schools in Sivas central province which were excluded from the study sample were given an open-ended questionnaire on which they were required to provide the meanings of the concepts as short, written answers. To detect any mistakes in the answers, the definitions of the concepts in the social studies text books and the *Büyük Türkçe Sözlük* (*The*

Great Turkish Dictionary, Türk Dil Kurumu [TDK], 2018) were consulted. For example, the TDK (2018) provides the meaning of the concept, "sovereignty" as "all the powers of the nation and the state, which is its legal personality and dominance." However, the students who had misconceptions about the concept "sovereignty" defined it as "management within the framework of the law, the power of the nation and the state, legislative-executive powers." By comparing the definitions of the concepts in the social studies textbook and the Great Turkish Dictionary with the student responses, misconceptions were identified about 13 concepts held by 123 participants – making up more than half of the sample (cf. Table 3).

Table 3 Distribution of students' answers related to the concepts

Concept no	Concept	Correct answer (*n*)	Incorrect answer (*n*)
1	*Sultanate*	27	220
2	Democracy	27	220
3	Sovereignty	24	223
4	Monarchy	21	226
5	Constitutional monarchy	21	226
6	Republic	20	227
7	Judiciary	14	233
8	Oligarchy	14	233
9	Executive	11	236
10	*National sovereignty*	7	240
11	*Secularism*	4	243
12	Theocracy	2	245
13	Legislature	1	246

Incorrect concepts such as sultanate, national sovereignty and secularism (cf. Table 3), which were included in the management concepts, were excluded from the scope because they were included in other concepts. Misconception elimination activities have been prepared for 10 other concepts that were determined to be misconceptions.

Data Analysis
The data obtained from the field notes and observations were analysed through descriptive analysis.

The WAT was used as the primary data collection tool. Before starting the implementation, WAT was explained and various WAT examples were presented. Students were given 3 minutes to respond to each concept. During this period, the students wrote the words that they thought were related to the key concept and related sentences.

To prevent the risk of students providing a chain response to a concept, each key concept was written on a single page five times after each other to remind them of what they were expected to respond to and not to write down unrelated words that pop up in their minds. If they did, this would negate the purpose of the test (Bahar & Özatlı, 2003). A related sentence corresponding to each of the key concepts was included after the five repetitions. In this section, the students were

requested to write sentences in which they used the key concept and the words they associated it with.

In addition, since the related sentence was more complex and on a higher level than a single-answer word, situations such as whether the sentence was scientific or not and whether it contained misconceptions of a different nature affected the analysis (Ercan, Taşdere & Ercan, 2010).

Reliability
We tried to explain all processes and stages in detail in this study. It was clearly stated how the data collection tools were developed, how the applications were made, and how the data were analysed and interpreted. In addition, the data obtained as a result of the analysis were described with supporting direct quotations. In the findings, the expressions in the worksheets, and the student and researcher diaries were scanned and presented, and the communication sections obtained from the observations were included. Different data collection tools were used in the research to enhance consistency, worksheets were collected, and we tried to minimise the loss of data. In order to ensure the credibility of the research, the codes and the situations developed by us were compared in order to confirm whether the sentences that emerged in the research represented the aforementioned conceptual

categories. After the two field experts coded the research data separately, the resulting code list was finalised. The consistency of the codes that we used independently was determined by marking them with "Agreement" or "Disagreement" depending on whether we used the same code for the students' expressions or not. The reliability of the data analysis performed in this way was calculated using the formula [Agreement / (Agreement + Disagreement) x 100] suggested by Miles and Huberman (1994) and the consistency rate of the study was found to be 93%.

Findings

The statistical analyses of the obtained data are presented in this section. Due to the page limitation in the article, many examples were not included.

Determination of Students' Prior Knowledge and Perceptions of the Concepts in the First Week

At the beginning of the first lesson, the WAT was administered to determine students' prior knowledge and perceptions about the concepts "republic, monarchy, oligarchy" and "theocracy." After the implementation, "Types of Government",

which is the first topic in the unit (Outcome 1. The student compares the different types of government in terms of the basic principles of democracy), was taught through the usual lecturing technique, and the first lesson was completed in this way. Action activities were prepared to address the deficiencies determined through the evaluation of the WATs completed by the students.

Activities to teach the concepts in the first week

To eliminate the students' misconceptions about the concepts, "republic, monarchy, oligarchy" and "theocracy", a concept map was used to work on these concepts in the second lesson, and the concept web form and MAT were used in the third lesson. At the end of the third lesson, the WAT, which had been used to determine the students' prior knowledge and perceptions in the first lesson, was administered again and the third lesson was completed in this way. The WATs completed by the students were analysed after school. The results of this analysis and a comparison of the number of words and sentences provided in the pre-test and post-test are given in Table 4.

Table 4 Number of words and sentences given by the students on week 2 concepts in the pre-test and post-test

	Number of words (*f*)		Number of sentences (*f*)	
Key concepts	Pre test	Post test	Pre test	Post test
1) Republic	118	120	118	120
2) Monarchy	99	120	99	120
3) Oligarchy	90	120	90	120
4) Theocracy	92	120	92	120

When Table 4 is examined, it is seen that while words and sentences were written by each student for all words in the post-test, the number of words and sentences produced, especially for three concepts (monarchy, theocracy and oligarchy) in the pre-test, was lower than in the post-test. In the post-test, there was a significant increase in the number of words and sentences to describe all concepts.

Determination of Students' Prior Knowledge and Perceptions of the Concepts in the Second Week

At the beginning of the first lesson, the WAT was administered to determine the students' prior knowledge and perceptions about the concept "democracy." After the implementation, the first subject of the unit, namely, "The History of Democracy" (Outcome 2. The student discusses the historical development of the democratic administration in different periods and cultures) was taught through lecturing and the first lesson was completed in this way. The WATs completed by the students were evaluated and action activities were prepared to address the misconceptions identified through this evaluation.

Activities to teach the concepts in the second week

The concept map form was used in the second lesson to eliminate the problems identified regarding the concept "democracy" and a worksheet and a structured grid were used in the third lesson. At the end of the third lesson, the WAT, which was used to determine the students' prior knowledge and perceptions in the first lesson, was used again and the third lesson was completed in this way. The students' WATs were once again analysed after school. The results from the analysis show that the students used the same words for the concept "democracy" in the pre- and post-tests. The reason might be that the concept is used a lot in daily life.

Determination of Student's Prior Knowledge and Perceptions of the Concepts in the Third Week

At the beginning of the first lesson, the WAT was administered to determine the students' prior knowledge and perceptions about the concept "sovereignty." Following the implementation, the subject of the lesson, "We Have Rights", (Outcome 3. The student argues that the right to live in democratic administrations, the right to personal

immunity, the freedom of religion and conscience, and the freedom of thought) was taught by giving a lecture and the first lesson was completed in this way. The WATs completed by the students were evaluated, and action activities were prepared to address the misconceptions identified in this evaluation.

Activities to teach the concepts in the third week
In the second lesson, the lesson was taught with the CCT prepared for this concept to eliminate the misconceptions regarding the concept "sovereignty" identified in the first lesson. In the third lesson, a general summary of the subject was made, and at the end of the lesson, the word association, which was performed to determine the students' prior knowledge and perceptions in the first lesson was used again and the third lesson was completed in this way. The students' WATs were analysed after school.

The results from the analysis show that the students used more or less the same words for the concept "sovereignty" were used by almost every student in the pre-test and by all the students in the post-test. The fact that the results from the pre-test and post-test were close to each other may have resulted from mentioning this concept in the previous lessons.

Determination of Students' Prior Knowledge and Perceptions of the Concepts in the Fourth Week
At the beginning of the first lesson, the WAT was administered to determine students' prior knowledge and perceptions about the concept "constitutional monarchy." After the implementation, the subject, "Human rights from past to present", was taught through the lecture technique to help students achieve the learning outcome (Outcome 4. The student analyses the historical development of human rights based on historical documents), and the first lesson was completed in this way. The WATs completed by the students were evaluated, and some action activities were prepared to address the misconceptions identified through this evaluation.

Activities to teach concepts in the fourth week
In the second lesson hour the lesson was taught with the CCT prepared to eliminate the inaccuracies

identified in the first lesson regarding the concept "constitutional monarchy." In the third lesson, a general summary of the subject was made, and at the end of the lesson, the WAT, which had been administered to determine the students' prior knowledge and perceptions in the first lesson, was administered again to complete the third lesson hour. The students' WATs were again analysed after school and some action activities were prepared to address the misconceptions identified through this evaluation.

The results from the analysis show that the students used the same words for the concept "constitutional monarchy" in the pre- and post-tests. The fact that the pre-test and post-test scores were close to each other may be due to the fact that the students compared this concept to other forms of government in the previous lessons.

Determination of Students' Prior Knowledge and Perceptions of the Concepts in the Fifth Week
At the beginning of the first lesson, the WAT was administered to determine the students' prior knowledge and perceptions about the concepts "legislative, executive" and "judicial." After the implementation, the subject of the lesson, "Women's place in the Turkish society" (Outcome 5. The student interprets examples of the position of women in Turkish history in terms of the development of women's rights), was taught through a lecture, and the first lesson was completed in this way. The WATs produced by the students were evaluated, and some action activities were prepared to address the misconceptions identified in this evaluation.

Activities to teach the concepts in the fifth week
In the second lesson, the lesson was taught using the CCT prepared for this concept to eliminate the students' misconceptions regarding the concepts "legislature, executive" and "judiciary" identified in the first lesson. In the third lesson, the subject was summed up and at the end of the lesson, the WAT was administered again, and the third lesson was completed in this way. The students' WATs were analysed after school and some action activities were prepared to eliminate the misconceptions identified in this analysis.

Table 5 Number of words and sentences given by the students to week 6 concepts on the pre-test and post-test

	Number of words (*f*)		Number of sentences (*f*)	
Key concepts	Pre test	Post test	Pre test	Post test
8) Legislature	106	120	106	120
9) Executive	105	120	105	120
10) Judiciary	113	120	113	120

From Table 5 it is clear that some words and sentences were written by almost all the students in the pre-test and by every student in the post-test. The concepts for which the least number of words were

produced in the pre-test were executive (105), legislature (106), and judiciary (113), which is also the case for the number of sentences. In the post-test, there was a significant increase in the number of

words and sentences for all the concepts. This means that meaningful learning occurred during the teaching of the subjects, and this shows that the connections related to these words were formed in the students' cognitive structures after the lectures.

Overall Assessment and Final Activities for All the Concepts in the Sixth Week

In the sixth week, concept puzzles on the concepts studied previously were prepared and administered to the students (cf. Figure 2).

Figure 2 Examples of puzzle activities done in the lesson

Table 6 Some examples of related sentences obtained from the pre-test data

Key concepts		Sentence examples containing scientific information	Examples of sentences containing unscientific or superficial information	Sentence examples containing misconceptions
1)	Republic	• In a republic, laws are decided by being discussed in the parliament.	• There is freedom in a republic.	• The place where the republic lives is the homeland.
2)	Democracy	• Democracy is a form of government practiced in a republic.	• There is participation in democracies.	• Democracy means the people.
3)	Sovereignty	• In a monarchy, sovereignty belongs to the king.	• Sovereignty is chosen by elections.	• Secularism is part of sovereignty.
4)	Constitutional monarchy	• In the constitutional monarchy, the last word was left to the sultan.	• The constitutional monarchy is a parliamentary administration.	• There is no sovereignty in the constitutional monarchy.
5)	Monarchy	• In the monarchy, the person who rules the state receives titles such as khan or khan.	• A monarchy is a state subordinate to the king.	• Monarchy is the piece of land on which the state lives.
6)	Oligarchy	• In oligarchy, the people do not have a say in the administration.	• There is no distinction between men and women in oligarchy.	• In oligarchy, the king sets the laws.
7)	Theocracy	• In theocracy, it is accepted that what the clergy say is said by God.	• Religion is believed in theocracy.	• In theocracy, the king rules the country.
8)	Judiciary	• There is the rule of law in the judiciary.	• There are laws in the judiciary.	• The king rules the judiciary.
9)	Legislative	• The legislature determines and creates the constitution.	• Legislation is based on rules.	• Legislation is an order given to man.
10)	Executive	• Executive power is vested in the president in our country.	• The executive is implemented with the approval of the state.	• Criminals are punished in execution.

From Tables 6 and 7, which include the sample sentences presented by the students about key concepts and related words, it is seen that the students formed sentences containing scientific knowledge in the pre-tests, while the number of these sentences increasing in the post-test in which they formed sentences with more qualified and more scientific content. A decrease in the frequency related to the sentences containing non-scientific and superficial information is seen in these tables together with its examples.

In terms of misconceptions, the students completely eliminated the misconceptions they had about three key concepts "democracy", "sovereignty" and "monarchy." The misconceptions in the pre-test regarding the concepts "republic", "theocracy", "oligarchy", "judiciary" and "legislature" were corrected, while very few misconceptions emerged in the post-test. While there were a lot of misconceptions about the concepts "legitimacy" and "execution" in the pre-test, these misconceptions decreased a lot in the post-test.

Table 7 Some examples of related sentences obtained from the post-test data

Key concepts	Sentence examples containing scientific information	Examples of sentences containing unscientific or superficial information	Sentence examples containing misconceptions
1) Republic	• In a republic, sovereignty belongs to the people.	• A republic has a homeland.	• Religious holidays are celebrated every year in the republic.
2) Democracy	• In a democracy, having more than one political party in the parliament is called pluralism.	• In democracy there are political parties.	
3) Sovereignty	• Sovereignty in a republic belongs to the people.	• Sovereignty is a free thing.	
4) Constitutional monarchy	• Our first constitution in the constitutional monarchy was Kanun-i Esasi.	• There is a parliament in the constitution.	• In the constitutional monarchy, the people elect the sultan.
5) Monarchy	• In a monarchy, only one person rules the country.	• There is no criticism in the monarchy.	• In a monarchy there is a state.
6) Oligarchy	• Oligarchy is the rule of the state by a group.	• There is no criticism in oligarchy.	• In oligarchy there is a state.
7) Theocracy	• In theocracies, the ruler is chosen by God.	• In theocracies, priests are believed to be learned people.	• Theocracy is read from the Bible.
8) Judiciary	• The highest court in the judiciary is the Constitutional Court.	• There is punishment in the judiciary.	• Equality has been achieved in the judiciary by means of punishment.
9) Legislative	• Legislation is given to parliament according to the constitution.	• The legislature has the president.	• Legislature, executive and judiciary are one.
10) Executive	• Laws enacted by the legislature are enforced by the executive.	• The executive is for the government.	• Executive form of state.

Conclusion

With this study we aimed to examine whether certain misconceptions held by sixth grade students were eliminated by carrying out action research in a social studies course taught with various activities based on concept teaching focusing on 10 concepts in the unit "Adventure of Democracy." For this purpose, 11 activities were carried out during the implementation of the study.

The WAT activities carried out before and after the implementation to eliminate the misconceptions identified regarding the concepts "republic", "monarchy", "oligarchy" and "theocracy", had a positive effect, and the students produced words and sentences for each concept in the post-test. Almost all of the sentences produced regarding these concepts consisted of sentences containing scientific information, and no sentences were left blank in the post-test. The number of misconceptions had decreased significantly.

The WAT activities held before and after the implementation to eliminate the misconceptions identified regarding the concepts "sovereignty", "constitutionalism", "legislature", "executive" and "judiciary" yielded a positive outcome, and the students were able to produce words and sentences related to these concepts in the post-test. Again, almost all of the sentences produced regarding these concepts consisted of sentences containing scientific

facts, and no sentences were left blank in the post-test.

Almost all misconceptions had been eliminated.

The WAT activities carried out before and after the interventions demonstrated a positive effect, and the students were able to produce words and sentences related to each concept in the post-test. Almost all of these sentences contained scientific facts, and no sentences were left blank in the post-test. The number of misconceptions had decreased significantly.

Discussion

Teaching key concepts using a concept map as part of the activities had a permanent effect on learning. Compared to traditional teaching, the concept map technique has been shown to increase learning success (Altıntaş & Altıntaş, 2008; Çolak, 2010; Yılmaz, H, Akandere & Korkmaz, 2010; Yılmaz, K & Çolak, 2012; Yılmaz, S 2008), which confirms that concept maps are effective in learning concepts, supported by the results obtained in our study. The concept webs used in teaching concepts were also found to be effective by Tuna (2013), which lends further support to this conclusion.

The WAT activities carried out before and after the implementation to eliminate the misconceptions identified regarding the concept "democracy" had a

beneficial effect, and the students produced words and sentences related to the concept in the post-test. Almost all of the sentences produced regarding this concept contained scientific facts, and no sentences were left blank in the post-test. The number of misconceptions had decreased significantly.

The concept map used within the scope of the activity was also determined to be effective in research conducted by Çelikkaya and Kürümlüoğlu (2019), which supports the conclusions reached in our study.

Within the scope of the implementation, teaching the lesson with CCTs was observed to have had a permanent effect on learning. CCTs have also been found to be effective in studies by Kılıçoğlu (2011) and Şarlayan (2017), which supports the result of our study.

It has been shown that concept puzzles were effective in teaching and they allowed constructivist, rather than traditional assessments. Kaymakçı (2012) found that puzzles facilitated teaching, and Alkış (2008) suggests that it is beneficial to use puzzles in teaching. Therefore, it can be concluded that concept puzzles are useful tools in learning concepts, which is in line with the results of our study.

Based on the results, the following suggestions are made:

- Studies on concepts such as republic, democracy, sovereignty, constitutional monarchy, monarchy, oligarchy, theocracy, legislature, judiciary and executive in different units of the social studies course can be done at the same grade level.
- Rather than simple and easy-to-understand examples from daily life, teachers can choose examples from the field of social studies.
- The stages of preparing and using activities to identify and eliminate students' misconceptions can be taught in detail and hands-on through in-service teacher training.
- In the textbooks distributed at the beginning of the academic year, the number of visuals can be increased to show the concepts effectively, and more attention can be paid to the definition of the specific concepts and the inclusion of more activities related to the concepts.

Authors' Contributions
TK and MK wrote the manuscript and provided data for the tables. Both authors reviewed the final manuscript.

Notes

References
Akgün İH 2015. Investigation of sixth grade students' level of achievement on the Adventure of Democracy unit in social studies in terms of some variables. *Electronic Journal of Social Sciences*, 14(55):68–78. https://doi.org/10.17755/esosder.18989

Aksoy N 2003. Eylem araştırması: Eğitimsel uygulamaları iyileştirme ve değiştirmede kullanılacak bir yöntem [Action research: A method to improve and change educational practices]. *Kuram ve Uygulamada Eğitim Yönetimi*, 36:474–489. Available at https://dergipark.org.tr/en/download/article-file/108417. Accessed 30 November 2023.

Alkış S 2008. Sosyal bilgiler programı "insanlar, yerler ve çevreler" öğrenme alanıyla ilgili kavram bulmacaları [Concept puzzles about "people, places and environments" learning domain of social studies program]. *Milli Eğitim Dergisi*, 180:68–79.

Altıntaş G & Altıntaş SU 2008. İlköğretim 5. sınıf sosyal bilgiler dersinde "kavram haritası" kullanımının öğrenci akademik başarısı üzerindeki etkisi [The effect of "concept maps" at the "social science class" of 5th grade students of primary school]. *Kastamonu Eğitim Dergisi*, 16(1):61–66. Available at https://dergipark.org.tr/en/download/article-file/819073. Accessed 30 November 2023.

Bahar M & Özatlı SN 2003. Kelime iletişim test yöntemi ile lise 1. sınıf öğrencilerinin canlıların temel bileşenleri konusundaki bilişsel yapılarının araştırılması [Investigation of the cognitive structures of the first-year high school students on the basic components of living things using the word communication test method]. *Balıkesir Üniversitesi Fen Bilimleri Enstitüsü Dergisi*, 5(2):75–85. Available at https://dergipark.org.tr/en/download/article-file/228350. Accessed 30 November 2023.

Bitlisli N 2014. 6. sınıf öğrencilerinin sosyal bilgiler dersi yeryüzünde yaşam ünitesinde geçen coğrafî kavramları algılama düzeyleri ve kavram yanılgıları [6th grade students' perception levels and misconceptions of geographical concepts in the unit of life on earth in social studies lesson]. Master's thesis. Giresun, Turkey: Giresun University.

Çelikkaya T 2018. Kavram öğretimi [Concept teaching]. In A Uzunöz & V Aktepe (eds). *Özel öğretim yöntemleri* (Vol. 1). Ankara, Turkey: Pegem.

Çelikkaya T & Kürümlüoğlu M 2019. Sosyal bilgiler dersi "Demokrasinin Serüveni" ünitesi ile öğrencilerin bilişsel yapılarının ve kavramsal gelişim süreçlerinin incelenmesi [Examination of cognitive structures and conceptual development process of students in "Adventure of Democracy" unit of social studies lesson]. *Anadolu Journal of Educational Sciences International*, 9(1):56–86. https://doi.org/10.18039/ajesi.520820

Çepni S (ed.) 2006. *Kuramdan uygulamaya fen ve teknoloji öğretimi* [Teaching science and technology from theory to practice]. Ankara, Turkey: Pegem Akademi.

Çolak R 2010. Kavram haritalarının sosyal bilgiler eğitimi çerçevesinde tarihsel kavramların öğretiminde kullanılması: Kavram haritası ile yapılan öğretim ile tutum, başarı ve kalıcılık

arasındaki ilişkinin incelenmesi [The use of concept maps in teaching historical concepts within the framework of social studies education: An examination of the relationship between teaching with concept maps and attitude, success and permanence]. Master's thesis. Istanbul, Turkey: Marmara University. Available at https://www.proquest.com/docview/2543761515/fulltextPDF/5C68AB2B995A4432PQ/1?accountid=14717. Accessed 30 November 2023.

Demirci MP 2003. Sınıf öğretmeni adaylarının ısı sıcaklık konusundaki kavram yanılgıları ve yanılgıların iyileştirilmesinde yapısalcı kuramın etkisi [Primary school teacher candidates' misconceptions about heat and temperature and the effect of structuralist theory on improving these misconceptions]. Master's thesis. Ankara, Turkey: Gazi University.

Doğanay A 2005. Öğretimde kavram ve genellemelerin geliştirilmesi [Development of concepts and generalizations in teaching]. In C Öztürk & D Dilek (eds). *Hayat bilgisi ve sosyal bilgiler öğretimi içinde*. Ankara, Turkey: Pegem A Yayıncılık.

Ercan F, Taşdere A & Ercan N 2010. Kelime ilişkilendirme testi aracılığıyla bilişsel yapının ve kavramsal değişimin gözlenmesi [Observation of cognitive structure and conceptual change through word association test]. *Türk Fen Eğitimi Dergisi*, 7(2):136–154. Available at https://acikerisim.ibu.edu.tr/xmlui/bitstream/handle/20.500.12491/2154/feride-ercan.pdf?sequence=1&isAllowed=y. Accessed 30 November 2023.

Erden M 1999. *Sosyal bilgiler öğretimi* [Social studies teaching]. Ankara, Turkey: Alkım Yayınları.

Göncüoğlu ÖG 2010. 6. sınıf sosyal bilgiler dersi demokrasinin serüveni ünitesinin öğretiminde drama ve işbirlikli öğretim yöntemlerinin öğrenci tutum ve başarısına etkisi [The effect of drama and cooperative teaching methods on student attitudes and success in the teaching of the 6th grade social studies lesson's adventure of democracy unit]. Master's thesis. Niğde, Turkey: Niğde Üniversitesi.

Grösser M 2007. Effective teaching: Linking teaching to learning functions. *South African Journal of Education*, 27(1):37–52. Available at https://www.sajournalofeducation.co.za/index.php/saje/article/view/49/75. Accessed 30 November 2023.

Johnson AP 2014. *Eylem araştırması el kitabı* [Action research handbook] (trans. by Y. Uzuner & MÖ Anay). Ankara, Turkey: Anı Yayıncılık.

Kaymakçı S 2012. Sosyal bilgiler dersinde bulmaca kullanıyorum [Solving puzzle in social studies]. *Araştırma Temelli Etkinlik Dergisi*, 2(2):86–99. Available at https://ated.info.tr/ojs-3.2.1-3/index.php/ated/article/view/80/119. Accessed 30 November 2023.

Kılıçoğlu G 2011. Sosyal bilgiler derslerinde kavramsal değişim metinlerinin kavram yanılgılarını giderme üzerine etkisi [The effect of conceptual change texts on eliminating misconceptions in social studies lessons]. PhD thesis. Ankara, Turkey: Gazi University.

Mills GE 2003. *Action research: A guide for the teacher researcher* (2nd ed). Upper Saddle River, NJ: Pearson.

Onwe SO & Nwogbaga DME 2015. Conceptual issues and theoretical analysis of sovereignty. *Research on Humanities and Social Sciences*; 5(3):19–24. Available at https://core.ac.uk/download/pdf/234674366.pdf. Accessed 30 November 2023.

Şarlayan R 2017. Kavramsal değişim metinlerinin sosyal bilgiler dersindeki kavram yanılgılarının giderilmesine etkisi [The effect of conceptual change texts on the elimination of misconceptions in social studies course]. Master's thesis. Kırşehir, Turkey: Ahi Evran University.

Selcuk G, Altintas G & Ciritci HM 2015. "Adventure of democracy" seen through animal metaphors created by 6th grade students. *Procedia - Social and Behavioral Sciences*, 191:185–189. https://doi.org/10.1016/j.sbspro.2015.04.383

Tuna F 2013. Ortaöğretim coğrafya öğretiminde kavram ağı yönteminin öğrencilerin başarısına etkisi ve öğrencilerin yöntem hakkındaki görüşleri [The impact of concept network method on students' success in secondary school geography education and students' perceptions of implementation]. *Kastamonu Eğitim Dergisi*, 21(3):985–996. Available at https://dergipark.org.tr/en/download/article-file/209997. Accessed 30 November 2023.

Türk Dil Kurumu 2018. *"Kavram" sözcüğü* [The word "concept"]. Available at https://sozluk.gov.tr/. Accessed 10 August 2021.

Yesari B 2018. Kavram bulmacalarının sosyal bilgiler 6. sınıf demokrasinin serüveni ünitesindeki öğrenci başarısına etkisi [The effect of concept puzzles on student achievement in social studies 6th grade adventure of democracy unit]. Master's thesis. Niğde, Turkey: Nigde Omer Halisdemir University.

Yıldırım A & Şimşek H 2016. *Sosyal bilimlerde nitel araştırma yöntemleri* [Qualitative research methods in the social sciences] (10th ed). Ankara, Turkey: Seçkin.

Yılmaz H, Akandere O & Korkmaz İ 2010. İlköğretim birinci kademe 5. sınıf sosyal bilgiler dersinde kavram haritalarının kullanılmasının başarıya olan etkisi [The effect of using concept maps in the first stage of primary school, 5th grade social studies course on success]. *Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi Dergisi*, 29:19–27.

Yılmaz K 2013. İlköğretim öğrencilerinin vatandaşlık eğitimi ile ilgili temel kavramlara ilişkin algılarının incelenmesi [An investigation into primary school students' perceptions of basic concepts about citizenship education]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 28(1):453–463.

Yılmaz K & Çolak R 2012. Sosyal bilgiler öğretiminde kavram haritaları kullanımının öğrencilerin tutum, akademik başarı ve bilgilerinin kalıcılık düzeylerine etkisi [The effects of concept maps on students' attitude, academic achievement and retention of knowledge in social studies]. *Uluslararası Cumhuriyet Eğitim Dergisi*, 1(1):1–16. Available at

http://cije.cumhuriyet.edu.tr/en/download/article-file/48589. Accessed 30 November 2023.

Yılmaz Ö 1998. Kavramsal değişim metinleri ile verilen haritaların hücre bölünmesi ünitesini anlamadaki etkisi [The effect of maps given with conceptual change texts on understanding the cell division unit]. Master's thesis. Ankara, Turkey: Ortadoğu Teknik Üniversitesi.

Yılmaz S 2008. İlköğretim 5.sınıf öğrencilerinin sosyal bilgiler dersi "haklarımı öğreniyorum" ünitesi ile ilgili kavramları anlama düzeyleri [The level of understanding of the concepts related to the "I am learning about my rights" unit in the social studies lesson of the 5th grade primary school students]. Master's thesis. Ankara, Turkey: Gazi University.

Zıngal Y 2015. 7E öğrenme modelinin sosyal bilgiler dersi "demokrasinin serüveni" ünitesinde işlenişinin öğrencilerin akademik başarı ve tutumlarına etkisi [The effect of the 7E learning model in the "adventure of democracy" unit of the social studies course on the academic achievement and attitudes of the students]. Master's thesis. Ağrı, Turkey: Ağrı İbrahim Çeçen Üniversitesi.