Research Article

The Effects of Formative Assessment on Academic Achievement, Attitudes toward the Lesson, and Self-Regulation Skills[*]

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Abstract

The purpose of this research is to examine the effects of formative assessment practices on students' academic achievement, attitudes toward lessons, and self-regulation skills in the fifth-grade social studies class. Mixed method research was used to conduct the study. The research group consisted of 45 students in the fifth grade of a secondary school in Erzurum in the academic year 2014–2015, and a teacher who performed the practices. Experimental procedures were carried out for 28 weeks. Social studies performance tests, attitude inventories for social studies classes, self-regulatory learning skills scales, semi-structured interview forms, and observation forms were all used as data collection instruments. As a result of the research, it was determined that the experimental group in which the formative assessment practices were performed had a significantly higher academic achievement levels and better attitudes toward the class than the students did in the control group. With regard to the students' self-regulation skills, although the formative assessment had a positive effect, no significant difference was found between the experimental and control groups. According to the researcher's observations and the interviews conducted with the teacher and students, it was determined that the general view on the application of formative assessment was notably positive.

Keywords

Formative assessment • Academic achievement • Attitudes toward the lesson • Self-regulation • Social studies

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Educational policymakers, teachers, and researchers are increasingly interested in formative assessment as it reflects and supports student learning (Bell & Cowie, 2001; Torrance & Pryor, 2001; Wiliam, 2011). Formative assessment is used at schools in 25 U.S. states as official policy (Altman et al., 2010). It is viewed as an essential strategy for reaching the targets set in many Organisation for Economic Co-operation and Development (OECD) countries and for acquiring qualifications in education. In many countries, guidance books have been developed to assist teachers in implementing a more systematic practice of formative assessment. In England, a formative assessment program was initiated in pre-school and primary school levels in 2000. In Scotland, similarly, teachers are encouraged to use formative assessment in their learning-teaching processes. New Zealand has also based its National Assessment Strategy, implemented in 1999, on formative assessment. Formative assessment is viewed as the most critical assessment strategy in many cities of Canada as well. Countries such as Finland, Germany, Sweden and Spain also emphasize the importance of formative assessment and the necessity of constant assessment of each student using different assessment methods such as verbal feedback, interviews and portfolio assessment (Klinger, Volante, & DeLuca, 2012; Looney, 2011; Organisation for Economic Co-operation and Development [OECD], 2005; Swaffield, 2011).

In Singapore, formative assessment contributes to teachers' professional development as well as to student learning by transferring professional development practices to the lesson plans (Koh, Lim, & Habib, 2010). Teachers use a range of assessment activities and strategies in the classroom to gain comprehensive insight into how much students learn as part of formative assessment. In addition to providing feedback to the students, they analyze the information, comment on it, and use it to inspect and organize teaching. Students are active information providers. They not only participate in learning and teaching activities, but also use assessment information to identify goals, make decisions about their own development, and develop an understanding of how qualified a work will be (Berry, 2008).

Formative assessment is defined by McManus (2008, p. 3) as a process in which teachers and students provide feedback during instruction to organize the learning and teaching process in order to increase student achievement. According to Miller and Lavin (2007), formative assessment can be viewed as a valid and vital part of the blending of teaching and assessment. Formative assessments inform teachers about whether the students have learned and they have an indicator qualification for how the teachers should plan their next lessons (Wuest & Fisette, 2012). There are four main components of formative assessment (Black, Harrison, Lee, Marshall, & Wiliam, 2003; Centre for Educational Research and Innovation [CERI], 2008; Wiliam, 2011; Wiliam & Thompson, 2007): (i) Explaining learning objectives and success criteria; (ii) increasing the quality of inquiry/dialogue; (iii) increasing the quality of marking/feedback/record keeping; and (iv) using self and peer assessment.

According to Heritage (2008), goals and criteria enable students to know what and why they will learn so that they can become active participants in what otherwise can be a passive learning process. When a new topic is introduced, it is crucial for students to share their goals, needs and criteria to get good results and notes (Gioka, 2007; Lombard & Schneider, 2013). From the beginning of the lesson, students are given the responsibility for their own learning, giving each one a chance to create their own knowledge of the subject, to work together with their peers and their teachers, to expand their framework and to move toward more complex knowledge and understanding (Ritchhart, Church, & Morrison, 2011). One of the benefits of sharing learning goals with learners is that they are given tasks in alignment with the goals (Moss & Brookhart, 2009).

One of the primary elements of formative assessment is asking questions (Hodgson & Pyle, 2010). Teachers can spend one-third of their teaching time asking students questions (Moss & Brookhart, 2009). According to Borich (2014), 50 or more questions are typically asked in elementary and secondary school classrooms during lesson time. Sometimes 80 percent of all school time can be spent on questions and answers. Such intense focus on a single strategy shows both its suitability and perceived effectiveness. However, not all questions are compelling. In other words, not all questions actively involve the learners in the learning process. Besides, most teachers do not use classroom dialogues to help students learn (Black et al., 2003). Asking questions in formative assessment is crucial to obtaining information about students' learning and understanding. This objective can be achieved if the questions are active and effective at determining the learner's depth of knowledge (McMillan, 2014).

At the center of formative assessment is the concept of feedback (Hattie & Timperley, 2007). The impact of formative assessment arises from the strength of the feedback provided to students about their learning and to teachers about their teaching (Andrade, Lui, Palma, & Hefferen, 2015). According to Shute (2008, p. 154), formative feedback is information transmitted to students that allows or encourages them to organize their thoughts or behaviors in order to improve their learning. Luckett and Sutherland (2000) emphasize that feedback provided through formative assessment has significant benefits when motivating students, helping students improve their learning, reinforcing their work, and providing them with a learning profile. Similarly, Snowball and Sayigh (2007) also point out that the value of teaching the teacher to provide individual students with feedback on their learning and performance improvement is undisputed.

Teachers are not the only source of feedback. Self and peer assessments can be taught carefully, guiding learners in how to provide constructive and learning-oriented feedback on their own (Andrade et al., 2015). Self-assessment is a process in which students

criticize their own work according to clearly stated expectations, usually provided in the form of goals or criteria, and then revise their work (Andrade & Valtcheva, 2009). Self-assessment is an excellent formative assessment strategy that provides students with immediate feedback on their performance according to established standards and criteria, and gives them information about how to make adjustments to improve what they learn and how they learn (Crooks, 2007). Harrison and Harlen (2006) also point out that self-assessment is one of the critical elements of formative assessment because it helps students participate directly in learning objective activities. Peer review or peer feedback is one way for students to comment on other students' work (Topping, 2009). Peer review is influential in creating a more participatory learning culture within the learning environment (Kollar & Fischer, 2010).

Hattie (2009) evaluated 800 meta-analysis studies on educational factors based on their impact size. This assessment included 52,637 studies and 146, 142 effect sizes investigating the effects of educational factors on students' academic achievement. According to the research results, formative assessment was the third most influential factor among 138 factors for students' achievement. In the same order, feedback, which is one of the most significant elements of formative assessment, came in at eighth place. However, only two meta-analyses (Burns & Symington, 2002; Fuchs & Fuchs, 1986) for formative assessment were included within the context of the assessment. It can be reported that these studies are not current and they are controversial in terms of reflecting the true characteristics of formative assessment. Two more meta-analyses studies (Dunn & Mulvenon, 2009; Kingston & Nash, 2011) were conducted in 2009 and 2011 regarding formative assessment. However, in some of the critical evaluations of these studies (Bennett, 2011; Briggs, Ruiz-Primo, Furtak, Shepard, & Yin, 2012; Filsecker & Kerres, 2012; McMillan, Venable, & Varier, 2013) various methodological problems in the research were found, and it was clear that more qualified studies should be conducted to examine the effects of formative assessment on academic achievement. In their literature review, Florez and Sammons (2013) also found that the impact of formative assessment on student outcomes, including achievement, attitudes, classroom behavior, participation, and motivation should be measured. In another study by Heitink, Van der Kleij, Veldkamp, Schildkamp, and Kippers (2016), a systematic assessment was made to evaluate the formative assessment. In the first stage, 25 studies were selected according to inclusion and qualification criteria in the study with 1743 publications. From these studies, it was found that three studies had high quality and that the number of qualified studies related to formative assessment was limited. In addition, most of the selected studies used a qualitative research design. From this point of view, this research is expected to contribute significantly to filling a gap in the literature.

Studies on formative assessment have been conducted in Turkey since 2009, and they have started to increase in recent years. In experimental studies with secondary

school students, Buldur (2014) examined the effects of the assessment process for formation performed with performance-based techniques on teachers and students. As a result of the research, it was determined that the assessment process for formation conducted with performance-based techniques was partially effective on students' achievement goal orientations. On the other hand, it was concluded that the experimental procedure process increased the students' perceptions of learning-oriented assessment environments and decreased their performance-oriented assessment environment perceptions. In addition, the perceptions of the students in the experimental group toward the experimental process on the assessment tasks were effective in terms of complying with planned learning, transparency, and considering students differences. Qualitative findings showed that a large proportion of the students in the experimental group had positive views on the assessment approach in the experimental process and that they would like to be similarly assessed in future science and technology lessons. When the results of the teacher in the study group were examined, it was determined that the teacher realized the effectiveness of formative assessment after experiencing the process that gave importance to the diagnostic assessment before the experimental process. Bulunuz, Bulunuz, and Peker (2014) examined the effects of formative assessment on how eighth-graders learn physics concepts. One hundred and ninety-seven students participated, and according to the research results, the formative assessment significantly increased the students' level of understanding of the underlying physics concepts. In a master's thesis study, Bala (2013) aimed to determine the contribution of formative assessment practices in addition to the direct reflective approach commonly used in teaching the "structure and properties of matter" subject in seventh-grade science and technology classes. The study, which had a weak experimental design, was conducted for about six weeks with 44 students in a secondary school in Ankara. In both groups, the same activities prepared by direct reflective method were applied. Some quizzes for formative assessment developed by the researcher were added to the experimental group. The results of the research showed that the formative assessment that was added to the more commonly used direct reflective approach had a positive contribution.

When the formative assessment practices in Turkey and in different parts of the world are analyzed, formative assessment can be said to be one of the most important factors in assessing both the teachers' learning and the students' learning processes at all levels of education. In this respect, the research conducted in Turkey on commonly encountered examples of formative assessment practices in the world can contribute to improving the learning-teaching process in terms of development and quality. Giving particular importance to the individual is essential to understanding how formative assessment highlighted with a constructivist learning approach constitutes the base of the education program put into practice in Turkey in 2005. Formative assessment improves the teaching process by eliminating learning deficits

through the use of active feedback. According to the related literature, formative assessment has a positive impact on many student behaviors, especially with regard to learning outcomes. In literature, formative assessment is ranked at the top of the list in studies comparing many teaching strategies, methods, and techniques in terms of the degree of impact on students' academic achievement. Relevant meta-analysis studies have also shown that formative assessment has a high impact size in terms of student success. However, critical studies of formative assessment in recent years have indicated that selected studies for meta-analysis are problematic in terms of the principles of methodological and constructive assessment, and that qualitative and empirical work on formative assessment is needed (Bennett, 2011; Briggs et al., 2012 Filsecker & Kerres, 2012; McMillan et al., 2013). From this point of view, it is expected that this study, which examines the effects of formative assessment practices on students' academic achievement, attitudes toward the lesson, and self-regulation skills in secondary school social studies classes, will contribute to the related literature. This research aims to examine the effects of formative assessment practices on fifth-grade students' academic achievement, their attitudes, and their self-regulation skills in social studies classes. The sub-problems that have been identified for this purpose are presented below:

(i) Is there a significant difference between control and experimental group students' social studies achievement after the practices?

(ii) Is there a significant difference between control and experimental group students' attitudes toward social studies after the practices?

(iii) Is there a significant difference between control and experimental group students' self-regulation skills after the practices?

(iv) What are the views of students on formative assessment practices?

(v) What are the views of the teacher on formative assessment practices?

Method

Research Design

Mixed method research was used and the research was carried out within the framework of embedded mixed method design. In embedded mixed method designs, a dataset provides a secondary supporting function in the study. For example, researchers embed qualitative research into a quantitative experiment to support the elements of experimental design (Creswell, Fetters, Plano-Clark, & Morales, 2009). This research involves questions requiring both quantitative and qualitative data in the responses. In order to respond to different types of questions, qualitative research

questions took a secondary position to the more dominant experimental research design questions.

In the quantitative dimension of the research, a quasi-experimental design was used with an unequal pre-posttest and control group. Participants in the quasi-experimental design were not randomly assigned to groups. Groups were not created for the experiment and were not entirely under control. Researchers used existing groups (Ary, Jacobs, Sorensen, & Razavieh, 2010, Gliner, Morgan, & Leech, 2009). Where random assignment to groups is not possible, the best option is quasi-experimental design (Robson, 2011). In this study, "Class B" and "Class D" were randomly determined as the control and experimental groups among the fifth grade classes existing in the school.

In the qualitative dimension of the research, a case study was used. A qualitative research case study consists of the intensive study of an incident (Glesne, 2011). This method requires the use of multiple data collection tools because no one data source is enough on its own; each has its own strengths and weaknesses (Ary et al., 2010). In this context, the researcher collected qualitative data via non-participant observations and semi-structured interviews with teachers and students.

Validity and Reliability

The following factors are considered in order to increase the internal and external validity in the experimental procedures: For internal validity, the school administration confirmed that no criteria were applied to forming the branches and that they were completely random. It was also determined that students lived in the neighborhood where the school was located and that their families were of similar socioeconomic status. The experimental and control groups were randomly selected without discrimination: one class was designated as the experimental group, and the other one was assigned as the control group. In this respect, it can be said that the characteristics of the students in the experimental and control groups were similar (subject characteristics). During the study, no subjects were lost from the experimental or control groups (loss of subjects). The data of the study were collected in their own classroom settings for both experimental and control groups. Therefore, there was no difference regarding the place where the data was collected (setting). Data collection tools did not change during the research procedure. Pre-test and post-test applications were carried out by the same teacher in both the experimental and control groups (data collection instruments). It can also be said that the use of the control group in the study reduced the testing effect (test effect). In the experimental group, the teacher informed the students that the researcher would observe their class for one year, but no information was provided about the particular experiment. Students might also be accustomed to seeing an observer in class because of the presence of trainee teachers in classes on some days of the week. In addition,

the fact that the research was carried out over a period of nine months is considered to have reduced the "Hawthorne effect" (subjects' attitude). Teaching in the control and experimental groups was carried out in similar classrooms. The same teacher taught both groups. In addition, the researcher observed no differentiation between the experimental and the control groups with regard to the teacher's attitudes and behaviors toward the students.

In order to increase internal and external validity of the study, the following factors were taken into consideration. For internal validity, during the experimental period of 28 weeks (84 hours of lessons) in the fall and spring semesters of the 2014–2015 academic year, the researcher attended the same class with the teacher and the students and observed in the same classroom environment (long-term interaction). Interview and observation techniques were used together (variation). A specialist was consulted for an opinion on qualitative research and the research topic; these were evaluated together and recommendations were taken (specialist examination). For external validity, direct quotes from interviews and observations were included (detailed description). The study group was selected according to the study's purpose of maximum diversity sampling (purposeful sampling).

Study Group

In the quantitative dimension of the study, the research group was formed by the students in the fifth grade of a secondary school in Erzurum in the academic year of 2014–2015. There were nine classes in the fifth grade at the school. Randomly, "Class B" was assigned as the control group and "Class D" was assigned as the experimental group. The characteristics of the school and the teacher that would carry out the practices were taken into consideration in determining the school where the research would be carried out. In order to increase the universality of the research and therefore the external validity, private, and socioeconomically high-level schools were excluded from selection. In addition, the teacher was willing to conduct the practices to be carried out during the two semesters. Forty-five students participated in the study: 21 in the control group and 24 in the experimental group. In the control group, 11 of the students were females and 10 were males. In the experimental group, there were 12 females and 12 males.

For the qualitative dimension of the study, the interviews were conducted with the social studies teacher who carried out the experimental procedures in both experimental and control groups. Twelve students were selected from the experimental group via the maximum diversity sampling method within purposeful sampling methods. In order to provide maximum diversity, students' gender and their social studies class achievement were taken into consideration. Six of the interviewed students were female, six were male; in terms of their level of achievement in the

social studies class, four of them were low, four of them were middle, and four of them were high. In the classification of the students according to the achievements in the social studies class, their first semester grades were taken into consideration. The social studies teacher who conducted the experimental procedures had 11 years of professional experience and had been working in the school for five years. In addition, he had a bachelor's degree from the social studies education program of the Faculty of Education and a master's degree in the same field. The teacher was 35 years old and male.

Procedures

The research was conducted in the fifth-grade social studies class at a secondary school for two semesters (28 weeks). The same social studies teacher lectured in both the control and experimental groups. The researcher was included as an observer in both experimental and control groups. Lessons in the control group did not include formative assessment practices conducted within the scope of the learning-teaching process in the current program. In the experimental group, formative assessment practices were included in the existing program practices. Formative assessment has four main elements: (i) explaining learning objectives and success criteria; (ii) increasing the quality of inquiry/dialogue; (iii) increasing the quality of marking/ feedback/recordkeeping; and (iv) using self and peer assessment. Within the framework of these four basic elements, the following practices were included in the learning-teaching process:

Explaining learning objectives and success criteria. The following practices were applied in explaining the learning objectives and success criteria: (i) At the beginning of each lesson, an explanation was provided to the students about what to learn that day. The lesson's learning outcomes were shared with the students by discussing them. (ii) Students were reminded about the learning outcomes during the lesson and at the end of the lesson. (iii) At the end of each lesson, students were asked to discuss what they had learned in the lesson. (iv) Students were informed of the success criteria necessary to be considered successful in the classroom activities. (v) Students were informed of the success criteria necessary to be considered successful in completing class homework.

Increasing the quality of inquiry/dialogue. The following practices were applied in increasing the quality of inquiry and dialogue: (i) The lessons were conducted mostly through cooperative group work in order to improve dialogue between the learners. (ii) The groups were formed in a heterogeneous way by the teacher considering such factors as the students' gender, achievement status, affective characteristics, etc. As a result, four groups consisted of five students and one group consisted of four students. (iii) The students' group friends were changed at the end

of each unit. (iv) Questions that measured high-level thinking skills and encouraged students to think were used often during the lesson. (v) Students were given time to think before they responded to the questions. Depending on the problem quality, students were given a minimum of 3 seconds and a maximum of 25 seconds to think before answering a question. (vi) While responding to questions measuring high-level thinking skills, students were given the opportunity to speak to their friends in the group. (vii) A "No Finger Up" strategy was applied during the question and answer process. With this strategy, no student raises a finger when the teacher asks a question; this helps to increase participation by all students and allows all students time to think about their response.

Increasing the quality of marking/feedback/record keeping. In terms of increasing the quality of marking, feedback and record keeping, the following practices were applied: (i) Students' in-class and homework assignments were generally assessed using comments instead of scores or points. (ii) Students were given opportunities to improve their activities or assignments in the light of the teacher's feedback. (iii) At the end of each subject and each unit, a quiz was conducted to determine the learning deficits of the students and to provide feedback. (iv) The quizzes were distributed to the students and feedback was given to them about their deficiencies. (v) Instructional arrangements were made according to the feedback received from the students in the context of quizzes, assignments, and activities. In this context, such arrangements as "additional reading," "individual activity," "small group work," "teaching by showing and doing," "re-explanation," "worksheet," "clarification of the used assessment criterion," "internet research," and "making a concept map" were used so that the unsuccessful students could catch up with the others. (vi) In the assessment of students, both diagnostic and formative assessment data were recorded. Student names were coded. (vii) It was made possible for the assessment data about the students to be transmitted to the class teacher for the following year. (viii) Rewards were used to show appreciation and encourage further student development. (ix) Rewards were used at the individual development level, not as a way to reward students in comparison with each other. During the quizzes, the students were rewarded for improvement on an individual basis.

Using self and peer assessment. In terms of using self and peer assessment, the following practices were applied: (i) Self and peer assessments were regularly included throughout the lesson. At the end of each unit, self and peer assessment practices were applied. (ii) The students were informed on how to conduct self-assessments and peer-assessments, and assessments were discussed in each application. (iii) Discussions also took place with students whose completed studies did not meet expected standards.

Data Collection Instruments

In the study, "Social Studies Achievement Test," "Social Studies Lesson Attitude Scale," "Self-Regulatory Strategies Scale," "Semi-structured Interview Form" and "Observation Form" were used as data collection instruments.

Social studies achievement test. For the development of the achievement test, a pool of questions was created by writing a total of 92 questions using two for each of the 46 learning outcomes in the fifth-grade social studies program. For the content validity of the questions, four social studies teachers working in the school and three lecturers specializing in the field of education programs and teaching were consulted. The test was finalized for pilot implementation in line with the teacher and specialist opinions. The test was applied to the sixth-grade students as they had studied the previous year. The test was applied in two parts depending on the development level of the students. The first part of the test consisting of 48 questions and covering the first four units was applied to 100 students studying in five different classes during the first week of the semester. The second part of the test consisting of 44 questions and covering the last four units was applied to the same group of students one day after the first test. After the pilot implementation of the achievement test, an item analysis was applied to each question to determine the degree of difficulty and distinctiveness. The distinctiveness degrees of the items ranged from -.11 to .83. When items with high distinctiveness ratings were selected in a way such that one question was taken from each learning outcome, the distinctiveness ratings of the 46 selected items ranged between .33 and .67. The average item difficulty coefficient of the test consisting of 46 items was .60; the mean item distinctiveness coefficient was calculated as .56. Each item in the test was calculated as one point, and the highest score in the test was 46 points. The KR-20 reliability coefficient of the test was calculated to be .86.

Social studies attitude scale (SSAS). SSAS was developed by Demir and Akengin (2010) to measure the attitudes of secondary school students toward social studies lessons. The scale consists of 4 dimensions and 26 items. Fifteen of the scale items have negative expressions. The scale was a 5-point Likert-type with the options of "strongly agree (5)," "agree (4)," "neutral (3)," "disagree (2)" and "strongly disagree (1)." The higher the scores obtained after scoring the negative items by evaluating them with the exact opposite, the more positive the students' attitudes were toward the social studies lesson. The Cronbach alpha reliability coefficient of the scale was calculated to be ,93. In this study, the construct validity of the scale was tested in the fifth-grade sample prior to the experimental procedures as the scale was to be used in the fifth-grade students' social studies class. Confirmatory factor analysis (CFA) was used to determine the construct validity of the scale. Except for the control and experimental groups, SSAS was applied to the 125 fifth-grade students studying at seven different classes in the school where the experimental procedures were to be

carried out. According to the goodness of fit indexes obtained from CFA (Chi-square = 849.7, $p < .05$; Chi-square / Sd = 2.91; RMSEA = .043; SRMR = .064; NFI = 95; NNFI = .96; CFI = .96; GFI = .91; AGFI = .87), it was stated that the construct validity of SSAS was also confirmed for this study. In this study, the Cronbach alpha reliability coefficient of the scale was calculated as, 91.

Self-regulatory strategies scale (SRSS). SRSS was designed by Kadıoğlu, Uzuntiryaki, and Çapa-Aydın (2011) to determine the self-regulation skills of high school students. The scale was a 6-point Likert type: (1) never, (2) rarely, (3) sometimes, (4) often, (5) usually, (6) always. The scale consists of 29 items in eight dimensions. The Cronbach alpha values of the measurements obtained from the scale ranged from .68 to .82 for the dimensions of the scale. The study conducted by Özkal (2013) concluded that SRSS could be used as a valid and reliable instrument for secondary school students. In this study, SRSS was used for fifth-grade students in social studies class. CFA was used to confirm the construct validity of the scale, and the Cronbach alpha coefficient was used to determine the reliability. SRSS for CFA was applied to 125 fifth grade students studying in seven different classes, except the experiment and the control group. According to the goodness of fit indexes obtained from CFA (Chi-square = 959.63, $p < .05$, Chi-square / Sd = 2.5; RMSEA = .062; SRMR = .056; NFI = .94; NNFI = .96; CFI = .92; GFI = .93; AGFI = .88), it was stated that the construct validity of SRSS was also confirmed for this study. In this study, the Cronbach alpha reliability coefficient of the scale was calculated as .96.

Semi-structured interview form. In the study, two different semi-structured interview forms developed by the researcher were used to examine the views of teachers and students toward formative assessment. The content validity of the semi-structured student interview form was examined by five educational program and teaching studies specialists and one social studies teacher. The necessary adjustments were made on the form in accordance with the specialist opinions. After the preliminary interview with two students in the experimental group, the interview form was finalized by correcting areas that were not understood or understood with difficulty. The form consisted of nine questions prepared to elicit students' views on formative assessment practices.

The content validity of the semi-structured teacher interview form was examined by five educational program and teaching studies specialists and one social studies teacher. The necessary adjustments were made on the form in accordance with the specialist opinions. After the preliminary interview with a social studies teacher (not the same one who would conduct the experimental procedures), the interview form was finalized by correcting areas that were not understood or understood with difficulty. The form consisted of 13 open-ended questions prepared to elicit the teacher's views on formative assessment practices.

Observation form. The researcher developed an observation form to support the data obtained from the quantitative method and interviews by qualitatively examining the effects of formative assessment practices on students' academic achievement, attitudes toward the class, and self-regulation skills. The observation form was also used to monitor whether the experimental procedures progressed in accordance with formative assessment principles and characteristics. The content validity of the observation form was confirmed by five specialists serving in the field of educational programs and teaching studies.

The observation form consists of four parts. In the first part, the date of the observation, the observation time, the information about the unit and subject are included. The second part describes the physical structure of the classroom in terms of size, seating arrangements, heat, lighting, ventilation, cleanliness, technology, and safety. In the third part, 19 expressions of the formative assessment, the observable status of such statements and the related explanations are included. In addition, observations on attitudes toward the class and self-regulation skills are included. The fourth part involved explanations for the learning-teaching process of the lesson and a space where the lesson could be further evaluated.

Data Analysis

In the quantitative data analysis, first it was examined whether the data obtained from the instruments corresponded with the assumptions of parametric tests. The Shapiro-Wilk normality test, central tendency measures, and skewness kurtosis coefficients were conducted to determine whether the data obtained from the control and experimental groups had a normal distribution. The Levine test was applied to determine whether the variances of the data obtained from the control and experimental groups were equal.

After the data obtained from the data collection means showed normal distribution and the variances were equal, it was decided to use parametric tests in the data analysis. In this context, independent samples t-test, covariance analysis (ANCOVA) and multivariate covariance analysis (MANCOVA) were used in the research. The univariate and multivariate normality, the equality of regression curves, the equality of variances and the variance-covariance equality assumptions required for the use of ANCOVA and MANCOVA were examined (Field, 2013; Pallant, 2013; Tabachnick & Fidell, 2014). All the assumptions regarding ANCOVA and MANCOVA corresponded to the results of the analysis. In the statistical analysis, the level of significance was accepted as .05.

In the qualitative data analysis, a descriptive analysis approach was used. The data were arranged according to the categories created by considering the interview questions, and direct quotes were frequently included. In the analysis of the

qualitative data obtained from teachers and students, first, the audio recordings were transferred to the computer software. Then, according to the questions used in the interview, descriptive analysis was conducted by creating categories. Frequency values were assigned to indicate how often the expressions in each category were used. Three encoders (the researcher and two specialists) were involved in the descriptive analysis process to ensure reliability. Three persons separately performed the coding. In the codifications, the percentage of agreement was searched using the formula (Agreement ÷ [Disagreement + Agreement] × 100), as determined by Miles and Huberman (1984). According to this formula, the percentage of agreement between encoders for all encodings was determined as 93%. This ratio indicated that the analyses were reliable.

Findings

Related to the Influence of Formative Assessment Practices

Descriptive statistics of the pre-test and post-test scores obtained from the academic achievement, SSAS and SRSS scales of the control and experimental group students are shown in Table 1.

Table 1

Descriptive Statistics of the Pre-Test and Post-Test Scores

Dependent Variable	Group	n	$\bar{x}$	Adjusted Mean
Academic achievement (Pre-test)	Control	21	23.43	23.43
	Experimental	24	22.42	22.42
SSAS (Pre-test)	Control	21	4.16	4.16
	Experimental	24	4.24	4.24
SRSS (Pre-test)	Control	21	4.27	4.27
	Experimental	24	4.15	4.15
Academic achievement (Post-test)	Control	21	28.19	28.25
	Experimental	24	34.13	34.07
SSAS (Post-test)	Control	21	4.32	4.32
	Experimental	24	4.75	4.75
SRSS (Post-test)	Control	21	4.35	4.35
	Experimental	24	4.62	4.63

As seen in Table 1, academic achievement pre-test scores of the control group students were 23.43; post-test scores were 28.19. Pre-test academic achievement scores of the students in the experimental group were 22.42; the post-test scores were 34.13. Pre-test SSAS scores of the control group students were 4.16; the post-test scores were 4.32. The pre-test SSAS scores of the students in the experimental group were 4.24; post-test scores were 4.75. The pre-test SRSS scores of the control group students were 4.27; post-test scores were 4.35. The pre-test SRSS scores of the students in the experimental group were 4.15; the post-test scores were 4.62. According to the independent t-test results conducted to determine whether there

was a significant difference between the pre-test scores of the students in the control and experimental groups, no significant difference was found between the students' academic achievement, SSAS and SRSS pre-test scores ($t_{(academic\ achievement)}$ = .535; p > .05); ($t_{(SSAS)}$ = -.472; p > .05); ($t_{(SRSS)}$ = -.669; p > .05). It was concluded that the students' academic achievement, SSAS, and SRSS scores were similar prior to the experimental procedures.

Table 2
ANCOVA Results of Academic Achievement Post-Test Scores

Source	Sum of Squares	df	Mean Square	F	p	η2
Corrected Model	415.836	2	207.918	2.835	.070	.119
Intercept	3472.424	1	3472.424	47.344	.000	.530
Pre-test	21.388	1	21.388	.292	.592	.007
Group	377.093	1	377.093	5.141	.029	.109
Error	3080.476	42	73.345			
Total	47739.000	45				
Corrected Total	3496.311	44				

There was a significant difference between the academic achievement post-test scores of the control and experimental group students ($F_{(1,\ 42)}$ = 5.141, p < .05, η2 = .109). According to this, it can be inferred that the academic achievements of the students in the experimental group statistically significantly increased with the experimental procedures as compared to the control group students.

Table 3
MANCOVA Results on SSAS Post-Test Scores

	Value	F	Hypothesis df	Error df	p	η2
Wilks' Lambda	.757	2.889	4	36	.035	.223

As seen in Table 3, there was a significant difference between the post-test scores of the control and experimental group students' attitudes toward the social studies class ($F_{(4,\ 36)}$ = 2.889, p < .05, η2 = .223). It was concluded that the attitudes of the students toward the social studies class in the experimental group where formative assessment practices were applied were significantly more positive than those of the control group students.

Table 4
MANCOVA Results on SRSS Post-Test Scores

	Value	F	Hypothesis df	Error df	p	η2
Wilks' Lambda	.670	1.727	8	28	.136	.330

As seen in Table 4, there was no significant difference between the post-test scores of the self-regulatory skills of the control and experimental group students ($F_{(8,\ 28)}$ = 1.727, p > .05, η2 = .330). For this finding, formative assessment practices were concluded not to have significantly affected the students' self-regulation skills.

Findings Related to Views on Formative Assessment Practices

In the second problem of the research, the question "What are the views of the students on formative assessment practices?" was asked. Students' views on formative assessments practices regarding their attitudes toward social studies class, attitudes toward teachers, group works, quizzes, self and peer assessments and reward usage were gathered in face-to-face interviews. The interviews conducted with the students were analyzed and presented based on the questions.

All of the students interviewed responded "yes" to the question "Do you like social studies class?" From this, it can be inferred that the students in the experimental group in which formative assessment practices were performed enjoyed social studies class and had positive attitudes toward it. In-class observations made by the researcher also support this result. The students were interested during the lesson and participated in the activities. In general, no negative attitudes toward the lesson were observed.

The question "Why do you like social studies class?" differed in responses. Six of the students said they liked it because the lesson was enjoyable; four students said that they liked the class because the teacher was good and the class was nice; three students said the class was nice and fun and one student liked the class because he was successful in social studies. In-class observations made by the researcher also support these findings. It was observed that the students had fun with their teachers. Examples of individual quotes for reasons students like social studies class are presented below:

Because the teacher teaches very well. I never liked this class in class 4. I love it more this year.

Because it is very enjoyable with the teacher. Because the subjects are fun.

All of the students responded "yes" to the question "Do you like the social studies teacher?" Based on this, it can be inferred that the students in the experiment group in which the formative assessment practices were performed had positive attitudes toward the teacher and that they liked the teacher.

The question "Why do you like your social studies teacher?" differed in responses: nine of the students stated that the teacher taught the class well; seven of the students said the teacher was fun and humorous; two of them indicated that they liked it because they learned the lessons well. It can be assumed that the love for the teacher who taught through formative assessment practices stemmed from the fact that the students perceived that the teacher taught well and treated the students in a humorous and fun manner. Accordingly, formative assessment practices were inferred to contribute to the increase of the students' love for the teachers. In-class observations made by the researcher also supported these findings. Throughout the lesson, it was observed that the students' communication with their teachers was very positive and

that they liked their teachers. Examples of individual quotes on the reasons why students liked the social studies teacher are presented below:

> The teacher makes me laugh a lot, tells the topics very well. I am learning.

> It is so much fun. The teacher teaches well.

All the students responded positively to the question "What do you think about group work performed during the lesson?" Seven students stated that group work increased their learning levels; seven students said that it provided cooperation; one student stated that it enabled sharing; and one student stated that it increased participation in the class. In-class observations made by the researcher also supported these findings. Examples of individual quotes from the students' views on group work are presented below:

> Very good. We all worked together and this enabled us to understand better. I think it was much better to share with our friends.

> I find it good. We can help each other. Together we learn better.

All students responded positively to the question "What do you think about the quizzes in the lesson?" Nine students stated that the quizzes increased their learning levels and six students said they had the chance to see their deficiencies. In-class observations made by the researcher also supported these findings. It was observed that the students were not bored by examinations made at the end of each topic; instead, they liked the quizzes made without grades and found them useful for seeing their errors. Examples of individual quotes of the students' views on quizzes are presented below:

> It helps. Nice. I see my mistakes. I look at all. They enable me to learn better.

> They contribute a lot. Teacher's explanation of what we do wrong enables us to do correctly in the exams.

For the question "What do you think about self and peer assessments in the lesson?" ten of the students found self and peer assessments useful. In addition, three students stated that self and peer assessments provided an opportunity to see their own situations; two students said the self and peer assessment gave them a chance to compare themselves with their friends, and one student mentioned the chance to see their deficiencies. According to the results obtained from the in-class observations, it was observed that students were generally willing in self and peer assessment practices, but rarely, some students got bored while filling out the forms. Examples of individual quotes of the students' views on self and peer assessments are presented below:

> Very good. We take the subjects we do not understand home and study harder. We have a chance to fix them.

> Helpful. We evaluate our friends and ourselves.

For the question "What do you think about how your teacher rewards your efforts?" all students found the rewards helpful. In addition, six students stated that the use of rewards increased learning; three students said the rewards increased their interest in the lesson; one student said the lesson was more fun and one student stated the rewards increased their self-confidence. According to the in-class observations, it was observed that the students were quite satisfied with the rewards. They were happy to receive the rewards and their motivation toward the class increased. Individual quotes of the students' views on rewards are presented below:

I find it good. It is affecting us very well. When the teacher gives a reward, we learn better.

I find it very good. I become very happy to receive a reward, I am learning better.

For the question "When you think about all the practices applied during the lesson, would you like to retake the social studies class like this?" all of the students stated that they wanted to take the social studies class again. In accordance with this, it can be inferred that students were very positive about formative assessment practices and wanted to take classes in which these practices were applied. From the point of in-class observations, it was observed that students were generally satisfied with the class, and that they used expressions such as wanting all classes to be similar to this one.

In the third problem of the research, an answer was sought for the question "What are the views of the teacher on formative assessment practices?" In this context, the face-to-face interview with the teacher asked for the teacher's views on formative assessment as a whole, as well as about specific formative assessment practices, including sharing learning outcomes with the students, discussing what the students learned at the end of class, reporting success criteria to the students in their assignments or class activities, conducting the class in groups, using high-level thinking questions in frequent assessment of the activities and examinations with feedback rather than grades, using rewards in the individual development of students, using self and peer assessments, and using quizzes. The interviews with the teacher were analyzed and presented based on the questions.

The response given by the teacher for the question "What do you think about the sharing of the learning outcomes of the lesson with students?" is presented below:

Children have preliminary knowledge about what they will learn. Therefore, they both create more curiosity and their attention is attracted to the subject. It is useful to know what they will learn in advance. They can accordingly prepare themselves step by step. It allows them to focus on learning at the beginning of the lesson. From these points of views, it is beneficial.

The teacher found it useful and significant to discuss the learning outcomes of the lesson with the students. By sharing their achievements, the teacher stated that the students would have a preliminary knowledge of the subject they would learn, they

would be curious about it, and that their attention would be drawn to it. According to the teacher, all these factors made it easier for students to focus on learning at the beginning of the lesson, knowing in advance what they would learn. The response given by the teacher for the question "What do you think about the practice of making speeches about what they have learned at the end of the lesson?" is presented below:

> It is crucial to get feedback from children. Children can identify the points they do not understand in these conversations. We can learn what they have comprehended or what they have not comprehended. Children can easily express themselves. It is useful from the point of controlling the learning outcomes.

The teacher considered the speeches made by the students about what they learned at the end of class significant in terms of receiving feedback. The teacher said that the students stated the points they did not understand in these speeches and the teacher accordingly found the opportunity to learn what they understood well and what they did not understand well. He also stated that it was very useful in determining whether the students attained the learning outcomes. The teacher's response to the question "What do you think about the practice of reporting success criteria to students in their homework or classroom activities?" is presented below:

> It is always beneficial to set criteria. It is an advantage for students who have successfully targeted themselves to know what to do and how to succeed. The students recognize what they must do to be successful and improve their performance and the quality of the learning outcomes.

The teacher found it useful to let students know the success criteria for their homework or classroom activities. With this practice, the teacher stated that the students' targeting themselves to success and knowing what would lead them to succeed improved their performances and the quality of the outcomes. The teacher's response to the question "What do you think about group work?" is presented below:

> It certainly helps. Because children know each other better and they share. It is turning the lesson into more fun. They think they are doing a different activity out of usual lesson monotony. It is more efficient. They share learning responsibility. I can say that students who were passive in the group previously started expressing themselves over time and they are more involved in the work. Students can also benefit from each other's good qualities. A child who does not know what to do will be able to take a friend as a model by looking at his other friend and start to do it on his/her own.

The teacher found the cooperative group work conducted during the class quite useful. Group work enabled such benefits as learning more about each other, sharing their experiences, making the lesson more fun, learning more efficiently, sharing responsibility for learning, passive students' starting to express themselves, increasing participation in the lesson, utilizing each other's capabilities, and the ability to see each other as models for how to learn. The teacher's response to the question "What do you think about the high-level thinking questions in the lesson?" is presented below:

They give the students a chance to imagine. Children love to tell themselves. In this regard, participation in the lesson is also increasing. They make students think. With questions, students are curious about what is happening and those questions provide better learning.

The teacher stated that the high-level thinking questions frequently used during the class enabled the students to improve their imagination, and that the questions increased participation in the class, encouraged the students to think, created curiosity in the students and provided better learning with these factors. The teacher's response to the question "What do you think about assessing the students' homework, activities, and exams with feedback rather than grades?" is presented below:

Assessing with explanations instead of grades ensures that learning takes the forefront. The students who focused on the full report grades at the beginning of the semester turned into more concerned students about their learning at the end of the semester. Feedback significantly increases students' learning.

The teacher expressed that feedback was a very efficient factor in learning. In particular, assessment of homework, activities and exams with feedback rather than grades encouraged the students who focused on the full report grades at the beginning of the semester to be more concerned about their learning at the end of the semester. This can be interpreted in a way that students prioritized learning over grades, which is one of the most essential purposes of formative assessment practices. The response given by the teacher to the question "What do you think about rewarding students when they individually improve themselves?" is presented below:

Rewards are encouraging children to a significant extent. Their motivation is growing. Notably, the fact that the students are not assessed in comparison with each other but in line with their own success and they are rewarded accordingly makes them live the feeling of being successful. This allows the students to learn better and their achievements significantly increase.

The teacher stated that the rewards were valuable because the students were assessed according to their own successes rather than in comparison with each other, and that the students improved their learning and thus they increased their success. The rewards encouraged students to increase their motivation, which positively contributed to the students' successes. The response given by the teacher to the question "What do you think about self and peer assessment applications?" is presented below:

Although it was not very beneficial at the beginning, I think it has become more advantageous over time because we are applying it consistently. I think it must be regularly used so that the students can focus on learning and they can recognize their own deficiencies. It is an essential element for students to take responsibility for their own learning. Sometimes it is boring for the students to fill out the forms, but at the end of the process, I think the benefits are better understood.

The teacher reported that self and peer assessment practices were not very useful at the beginning, but they were beneficial when applied with constant and regular

attention. Self and peer assessments enabled the students to focus on learning and to be aware of their own deficiencies. In addition, the teacher emphasized that the applications were boring from time to time, but that at the end of the process, the students better understood the benefits and were able to take responsibility for their own learning. The response given by the teacher to the question "What do you think about the quizzes?" is presented below:

> It certainly is very useful. The students have an opportunity to be aware of their deficiencies. I find a chance to learn what students have understood and then I take individual precautions. This significantly increases the success of students.

The teacher suggested that the application of a quiz at the end of each topic was very useful. He expressed that the students could see their own deficiencies and he then could learn what the students had understood with the practice of quizzes. In addition, the teacher stated that he took individual measures according to the deficiencies determined by the quizzes and that this significantly increased the success of the students. The teacher's response to the question "How do you find the formative assessment practices as a whole?" is presented below:

> I think all elements of the formative assessment are useful. The combination of these together makes it possible for students to focus on learning rather than grades. This also significantly improves the success. In general, I think the formative assessment in classroom applications in our education system must be the principle assessment, and the assessment based on exams should be largely reduced or completely removed.

The teacher stated that it was a very useful strategy when evaluating formative assessment practices as a whole. With formative assessment practices, the students focused on learning extensively, which significantly increased their success. He also noted that formative assessment practices should be included in classroom practices and should be the primary understanding of assessment. These expressions can be viewed as a sign of how much the teacher cared about and adopted formative assessment practices. The teacher's response to the questions "What do you think about the applicability of formative assessment?" and "Will you use it for your next lessons?" is presented below:

> I plan to use these practices in all my future lessons. There is no reason not to use. I do not think these practices bring any more burdens than the ones exist. If we can use it in these classes where we do not have any equipment, anyone can use it. The benefits are considerable. All teachers should use it and, above all, formative assessment should be the teachers' main understanding of assessment.

The teacher stated that the formative assessment had many benefits and that he would use the formative assessment practices in all future classes. He also emphasized that applications could easily be used in his own class without any equipment, and that they could also be used in all classes. He reported that the practices did not

place any more burden on the present practices and that all teachers should have an understanding of this assessment. The teacher's response to the question "What are the missing aspects of formative assessment practices?" is presented below:

> I do not think something is missing. I think it can be even more useful and productive if only combined with technology. We can turn the lessons into more enjoyable environments. By addressing more sensory organs, we can provide better learning.

The teacher stated that the formative assessment did not have any missing aspects, but it could be applied more effectively and efficiently if combined with technology. He also emphasized that formative assessment practices integrated with technology would make the class more enjoyable and increase students' learning by appealing to more sensory organs. The teacher's response to the question "How do you think the formative assessment practices affect the attitudes of the students?" is presented below:

> I think they have a positive influence on the attitudes of the children toward the lesson. Throughout the process, they began to enjoy more and like lessons as they got used to the practices. At the end of the term, I can say that all students had very positive attitudes toward the lesson. Children were delighted in this lesson. In this case, the practices affected their successes in the positive direction. When I compare that class with the other classes, I can say that their achievements are higher. Particularly unsuccessful or uninterested students made significant progress.

The teacher stated that formative assessment practices positively influenced students' attitudes. With the students' familiarity with the practices over time, they started to enjoy the class. He also emphasized that the students' attitudes toward the lesson at the end of the semester were quite positive and the positive atmosphere in the class increased the achievement of the students, mainly because he saw relatively that unsuccessful or uninterested students made significant progress compared to the other classes.

Conclusion, Discussion, and Implications

The Effects of Formative Assessment on Students' Academic Achievement

In the study, the academic achievements of the students in the experimental group where the formative assessment practices were applied were significantly higher than the ones in the control group where no formative assessment practices were applied. This result also coincides with the results of studies in the literature examining the effect of formative assessment on academic achievement. Meta-analysis of many studies has also shown that formative assessment raises standards and increases students' achievement (Black & Wiliam, 1998; Fuchs & Fuchs, 1986; Kingston & Nash, 2011).

There are many studies conducted at different levels that concluded that formative assessment significantly increases the academic achievement of students (Alkharusi, 2008; Bell & Cowie, 2001; Black & Wiliam, 1998; Choi, Nam, & Lee, 2001; Crooks,

1988; Furtak et al., 2008; Herman, Osmundson, Ayala, Schneider, & Timms, 2006; Peterson & Siadat, 2009; Shepard, 2000; Taras, 2007; Wylie & Ciafalo, 2010; Yeh, 2009). In the present study, observations made by the researcher also support the results in the literature. Such characteristics of formative assessment as no comparison of the students, assessment of the students according to their own development levels, and prioritizing learning rather than grades have more influence, especially on students with low academic achievement, by enabling them to participate in the lesson and increase their success accordingly.

There are also studies in the literature that have shown formative assessment does not statistically significantly affect student academic achievement. Andrews (2011), Collins (2012), and King (2003) concluded that formative assessment did not significantly affect students' academic achievement in a positive way; however, the influence was not statistically significant. Yin et al. (2008) found that formative assessment did not lead to a significant influence on students' achievement, motivation, and conceptual changes; however, this stemmed from the difficulty of effective implementation of formative assessment rather than its effectiveness. Tuominen (2008) also concluded that formative assessment did not significantly increase student academic achievement, and attributed this to the short duration of the study and the diversity in teachers' individual practices.

The Effects of Formative Assessment Practices on Students' Attitudes toward the Lesson

In the study, the attitudes of the students toward social studies class in the experimental group where the formative assessment practices were applied were significantly higher than the ones in the control group where no formative assessment practices were applied. Similar research results are found in the literature. Tekin (2010) found that formative assessment practices in eighth-grade mathematics class significantly increased students' attitudes toward mathematics. That study determined that the students in the experimental group developed a positive attitude toward mathematics. King (2003) concluded in an experimental study that formative assessment improved the attitudes of fifth-year students in secondary school toward science class. Hwang and Chang (2011) concluded in a similar experimental study in Taiwan that mobile learning aided formative assessment significantly increased the interest and attitudes of fifth-year secondary school students toward learning in local culture class. In the study conducted with seventh-grade science students in secondary school, McKenna (2011) examined students' attitudes toward science class in the middle of experimental practices (week 11) and found that 96% of the students viewed formative assessment as a positive influence on their attitudes. According to Irons (2008), formative assessment improved students' attitudes toward learning

because it focused primarily on helping students understand their learning levels. Johnson (2016) reported that formative feedback in the action research in high school mathematics class positively affected the attitudes and perceptions of the students toward assessment. In addition, the last study determined that students also increased their desire for learning, confidence, and responsibility.

When the effect of formative assessment practices on students' attitudes toward class is evaluated in conjunction with the results obtained from the present research and the results in the literature, it is clear that formative assessment significantly improves students' attitudes toward the class. One can infer that the elements applied in formative assessment practices, including prioritizing the learning and making up of deficiencies instead of grading, teaching groups requiring sharing and cooperation instead of individual efforts, and assessing students in accordance with individual development levels instead of comparing them to each other all help students develop positive attitudes toward class.

The Effects of Formative Assessment Practices on Students' Self-Regulation Skills

In the study, the self-regulatory skills of the students toward social studies class in the experimental group where the formative assessment practices were applied did not significantly differ from the ones in the control group where no formative assessment practices were applied. Although there was no statistically significant difference, it was determined that formative assessment practices increased self-regulation skills of students. In an experimental study with similar results, King (2003) examined the effect of formative assessment on self-regulation skills of fifth-year secondary school students and found no significant difference between self-regulation skills of the experimental group and control group students. According to the results obtained from the qualitative data of the study, the students utilized various cognitive strategies and self-regulatory learning behaviors during the learning process. The students stated that they took responsibility for their own learning and that they actively and directly participated in learning. The teachers stated that formative assessment increased the students' self-regulation skills providing a continuous and purposeful interaction between teacher and students, which was learning effort and performance directed. Formative assessment increases achievement in diagnostic exams supporting the students' development of self-regulation and metacognitive skills and their development through educational standards (DeLuca, Klinger, Pyper, & Woods, 2015). Woods (2015) evaluated the relationship between formative assessment and self-regulation in a study and emphasized that the teachers who apply formative assessment strategies should understand the students' self-regulatory learning processes in order to make correct decisions. In addition, Woods (2015) advised that teachers should frequently use formative assessment in order to develop

the students' self-regulation skills and increase their motivation. William (2014) also stated that self-regulatory learning could be a key element of a productive formative assessment in relation to the strategies of "explaining, sharing and comprehending the learning objectives and success criteria" and "students' taking the responsibility for their own learning."

Self-regulation skills require students to actively use their cognitive skills, make efforts to reach their learning goals, get help from their friends, teachers or parents when necessary, and most importantly, take responsibility for their own learning. Therefore, the nature of formative assessment based on learners' learning and the applications aiming at eliminating learning deficits are closely related to the self-regulation skills of the students. However, it can be interpreted that self-regulation skills can be developed over a long period of time through appropriate and consistent approaches. When the results obtained from the research and the results in the literature were evaluated together, it was determined that formative assessment practices increased the self-regulation skills of the students but did not significantly affect them. This result can be explained by the fact that even though formative assessment practices were carried out within the framework of an educational year, the practices were only applied within the scope of the social studies class, and self-regulation skills might change over the long-term.

Views on Formative Assessment Practices

According to the results obtained from the research, the views of the students in the experimental group and the teacher applying the practices are highly favorable for formative assessment practices. The students expressed that they liked the social science class when the formative assessment was applied for reasons such as being fun, the teachers' being good, the topics' being nice and their success in the class. In addition, it was determined that all of the students also loved the social studies teacher for reasons such as the teacher's teaching well and being humorous and fun. According to these results, one can infer that the students had very positive attitudes toward both the teacher and the social studies class. These results also coincide with the quantitative findings obtained from the research on attitudes toward social studies class. Qualitative findings reveal a meaningful difference in favor of the experimental group for the social studies class.

Other results from student interviews are related to group work, quizzes, peer reviews, and reward use within the framework of formative assessment practices. According to the results obtained, all of the students found group work, quizzes, and rewards quite useful. Self and peer assessments were found to be helpful by all students except for two of them. The reasons for accepting these practices as useful are as follows: group works for increasing learning, cooperating, sharing, and

participation in the lesson; quizzes for increasing their learning and recognizing their deficiencies; self and peer assessments for seeing their own situation, comparing with their friends and seeing their deficiencies; rewarding individual developments for increasing their interest in the lesson and their self-confidence, and making the class more enjoyable. The most significant characteristic of formative assessment practices is that it increases students' achievement by prioritizing learning over grades. From this point of view, according to the students' views, each formative assessment practice was beneficial and enhanced learning. Qualitative findings support the significant difference in favor of the experimental group over the control group students. Another consequence of student views is that all students were willing to take a social science class using formative assessment practices again. This view also supports the benefits that the students realized from the formative assessment practices.

Formative assessment was perceived as useful by students (Cassady & Gridley, 2005). King (2003) interviewed the students at the end of his experimental work in the fifth-grade science class at secondary school. Students reported that formative assessment practices were a valuable strategy for developing their knowledge and understanding. They stated that formative assessments allowed them to focus on their learning goals, increase feedback mechanisms that inform their progress and increase their learning permanence.

The views of the teacher who carried out the formative assessment practices were also very positive. The teacher found all these practices useful: sharing learning outcomes in discussion with the students, talking to students about their learning at the end of the class, sharing the success criteria in the homework or class activities with the students, conducting the lesson with group works, frequent use of high level thinking questions, assessing homework, activities and quizzes with informative feedback instead of grades, rewarding students in accordance with their individual developments, self and peer assessment, and quiz examinations at the end of each topic.

When the teacher evaluated formative assessment practices as a whole, the teacher also noted that formative assessment was a useful strategy for increasing students' learning and achievement. The teacher also stated that formative assessment had positive effects on students' views of the class and that they enjoyed it. The teacher's views coincide with the student' views and the quantitative findings related to success and attitude obtained from this research.

Formative assessment makes the teaching more effective (OECD, 2005) by directing students to reach learning goals, setting learning needs and adjusting teaching accordingly, and increasing teacher awareness of effective teaching approaches (Harrison, 2005; Lee & Wiliam, 2005). According to the results they obtained from formative assessment projects, Black et al. (2003) stated that teachers

were beginning to accept teaching as support for students' learning rather than as simply complementing the educational curriculum.

Teachers process the educational program as a sequence of goals for students on behalf of success, as they can see the gap between the goals and the students' current learning situations. Teachers' perceptions of students also change as skill levels increase. Teachers are beginning to see that they can improve their students' achievements with appropriate help and support; therefore, they can try to minimize the competition that disrupts the motivation of students who find it difficult to achieve some learning goals. King (2003) concluded in the study that teachers accepted formative assessment as a valuable teaching strategy, and they thought that it improved science teaching. However, the teachers also pointed out that the implementation was limited in time and the pressure of responsibility had a negative effect. In another study, Buldur (2014) used formative assessment techniques based on performance in a secondary school science classes. As a result of the study, it was determined that the teacher placed importance on diagnostic assessment prior to the experimental process, while the same teacher became aware of the effectiveness of formative assessment after the process. The teacher's views on assessment techniques were determined to be positive, and the teacher was found to be aware of the advantages and limitations of most assessment techniques. While applying techniques based on performance before and after the process, it was noted that the techniques had difficulties such as not being economical, taking too much time, making class management difficult, and students' not understanding the techniques. Gökçe (2014), in a study of English teachers' perceptions of formative assessment, concluded that the majority of teachers thought that formative assessment practices helped learners learn and should be used in teaching. In a similar study, Büyükkarcı (2014) determined that English teachers had positive attitudes toward formative assessment. In addition, that study also concluded that the teachers believed that the key elements of formative assessment such as feedback, sharing learning goals, and self and peer assessment could be useful in the learning process and should be implemented in their classrooms. Another consequence of the research was that teachers were not capable of frequently and efficiently using formative assessment practices in their classrooms. Teachers attributed the cause of this situation primarily to crowded classrooms. Another reason attributed was that workloads were heavy and there were many subjects that needed to be taught. In another study conducted with English teachers, Öz (2014) concluded that teachers preferred traditional assessment methods such as self- and peer-assessment instead of using formative assessment tools.

Another result obtained from the interview with the teacher who applied the practices is related to the limitations and applicability of the formative assessment. The teacher stated that he thought formative assessment had no limitations and he suggested that it would increase the success even further if used with technology.

He noted that the applicability of the formative assessment was high, and that it was used successfully in classrooms with no technological equipment or tools without any significant problems. Gikandi, Morrow, and Davis (2011) stated that the overall implementation of formative assessment was clear, but cautioned that some affairs might go wrong. In particular, they pointed out that feedback in formative assessment should be clear, timely, continuous and adequately detailed, and emphasized that reliability could not be maintained unless multiple assessment opportunities were offered for the students' learning. Despite the increasing evidence for positive effects of formative or school-based assessments, it is not expected that the process of change will be easily realized and managed, considering the complexity of teaching content and the dimensions of teacher factors (Black, 2005; Sato, Coffey, & Moorthy, 2005). The search for the possibility of implementing a formative or school-based assessment requires micro-level review of the nature of this change at the macro-level review of the content and conditions to be developed (Black, 2005).

In conclusion, formative assessment practices have been found to increase students' academic achievement and attitudes toward the class significantly and to affect their self-regulation skills. Process assessment rather than product assessment was given priority in the education program implemented in Turkey in 2005, and it was developed with regard to constructivist learning theory. In this respect, it is necessary to use the concept of formative assessment, which prioritizes eliminating the deficiencies of the students and emphasizes it as the dominant assessment approach in teaching processes. According to the findings obtained from the present research, formative assessment evaluates the students according to their own development levels without comparing them with each other and increases the attitudes and academic achievements of the students toward the classes by individually monitoring their achievements in learning outcomes. In formative assessment, students are trying to make up for their deficiencies by taking responsibility for their own learning instead of just trying to get a good grade. In this respect, formative assessment ensures that students are able to cope with negative factors such as high levels of examination and grading. The opportunity of discussing the learning outcomes of the lessons at the beginning of each lesson and reminding them during the lesson provides an opportunity for the students to reach for the goal and to evaluate what they are doing to reach the goal. In addition, implementing group works in the teaching process provides the development of cooperation and solidarity skills instead of individual competition among students. When the elements of formative assessment and the findings obtained from the practices are taken into consideration, the change to the dominant understanding of assessment to formative assessment in secondary levels, which is currently dominated by the summative assessment approach based on exams, is likely to increase students' achievement significantly and thus to raise the quality of education. In accordance with the findings obtained from the present

study, the following implications apply for both practitioners and researchers: (i) The Ministry of Education should make arrangements in curricula for the use of formative assessment as a dominant assessment approach in primary and secondary schools. (ii) School-based in-service training seminars or lessons should be organized so that formative assessment practices can be widely used. (iii) In classroom assessments, students should be assessed according to their level of development rather than in comparison with each other. (iv) Classroom tasks or homework should be assessed using comments instead of marking things as incorrect and assigning grades. (v) Lessons should often be conducted through collaborative group work in order to improve the dialogue between learners. (vi) The influence of formative assessment on academic achievement and attitude toward classes should be examined within the context of different classes. (vii) The influence of formative assessment on academic achievement, attitudes toward class, and self-regulation should be examined at different stages. (viii) The influence of the formative assessment on different dependent variables should be examined. (ix) Teachers' perceptions of formative assessment practices should be examined. (x) The extent to which teachers have included formative assessment practices in their current practice in the teaching-learning process should be examined through qualitative studies. (viii) Theoretical studies should be conducted in order to provide a clearer picture of the definition and content of formative assessments.

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