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The Use of open-ended items for giving feedback during the formative assessment process

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Abstract: Feedback plays an important role in classroom learning and teaching process. This study focuses on how feedback can be more effectively used in the formative assessment process. According to this purpose, the study first discusses the concept of student achievement and presents its changing nature in the 21st century. Subsequently, the study addresses higher-order thinking skills, the use of open-ended items in improving student achievement in the classroom, rubrics, formative assessment, and feedback. The study aims to present an exemplary measurement and assessment model that will contribute to the development of student achievement. Additionally, it examines the use of a feedback approach that will improve the power of using the knowledge of the students learned in lessons in daily life by associating it with basic life skills in the formative assessment process. Accordingly, teachers are provided with a unique means that they can easily use in improving classroom success. In the study, an open-ended item has been developed that has a real-life counterpart is used to provide information on the improving of student achievement, while a rubric used in scoring the answers to the item is also developed. The answer categories in the rubric show the place of the student in the distribution of success. Thus, teachers will be able to see what students can and cannot do, as well as be able to give accurate and realistic feedback on what needs to be done for the development of student achievement.

1. INTRODUCTION

1.1. The Concept of Student Achievement and Change in the Understanding of Student Achievement

The word "success" is frequently used in daily life to refer to individuals' work and professional lives, academic careers, financial gains, and private lives. Gerberich et al. (1962) define success as the work undertaken in a planned and programmed manner to attain a desired result in line with set goals. Comparatively, Wolman (1973) defines success as progress made toward achieving a desired result.

When school learnings are taken into consideration, the level of students learning basic information and using what they have learned in new situations is used as academic

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achievement, unlike the concept of success. Haladyna (1997) states that the concept of achievement includes students' learning at the knowledge level (understanding the course content) and at the skill level (using the understood knowledge in practice). Koç (1978) handles the concept of success in terms of school achievement, and refers to it as the progress that the student has made in achieving those results determined by their school, class, and course.

The main aim of school education in the current century is to enable individuals to transfer the basic knowledge and skills they have learned at school to real life (Brookhart, 2010, 2014; Marzano, 1992; Nitko, 2001; Popham, 2000). Achievement in this sense, is defined as the development of those high-level thinking skills that enable students to use what they have learned in real-life situations (Haladyna, 1997; Kutlu et al., 2017).

In the 21st century, when information and technology are widely used in every field, individuals are expected to adapt to social change rapidly and may even become the initiating force of new changes. According to Aslanoğlu (2022), an education system in the 21st century is expected to incorporate students' needs in order to help them become productive and efficient users of technology, improve their critical thinking, and make them independent, autonomous, and lifelong learners.

All educational institutions have responsibilities for individuals to educate with these characteristics. Considering the socioeconomic, technological, and cultural changes in current social life, there is a need for a more inclusive definition of achievement within education. In the comprehensive report *What Matters to Student Success: A Review of the Literature*, Kuh et al. (2006) describe student success as "academic achievement, engagement in educationally purposeful activities, satisfaction, acquisition of desired knowledge, skills and competencies, persistence, attainment of educational outcomes, and post-college performance". York et al. (2015) update this definition and present a conceptual model of academic success, and define the concept based on their findings as being inclusive of "academic achievement, attainment of learning objectives, acquisition of desired skills and competencies, satisfaction, persistence, and post-college performance".

Haladyna (1997) and Kutlu et al. (2017) emphasize that student achievement should be considered in relation to an individual's mental development. Haladyna (1997) defines mental development into three dimensions: knowledge, skill, and ability. Knowledge refers to the recall or understanding of course content and skills the use of remembered and understood information for practice. Knowledge and skills are developed in short periods, such as lessons, a unit, or semester, and in most cases do not change from individual to individual until proven otherwise. Abilities, on the other hand, are high-level mental structures that can be developed throughout life.

1.2. Use of Open-Ended Items in Monitoring of Classroom Learning Achievement

This study discussed student achievement within the context of developing higher-order cognitive skills. Kutlu and Altıntaş (2021) define student achievement as the power of students to use their cognitive, intrapersonal, and interpersonal skills in realistic situations. The relevant literature describes student achievement as higher-order thinking skills whereby individuals associate different sets of information with one another (Brookhart, 2010; Haladyna, 1997; Kutlu et al., 2017; Marzano, 1992; Popham, 2000).

It is important for teachers to conduct classroom assessment and evaluation practices using open-ended items based on real-life situations that already exist in students' knowledge and experience. Brookhart (2014) describes open-ended items as those having multiple correct answers or that include multiple solutions. In this sense, teachers should pay attention to whether the topics they address in the lesson contain more than one answer in writing open-ended items. Popham (2000) emphasizes that the use of open-ended items is inevitable,

especially in the measurement of certain characteristics that require originality such as problem-solving processes, writing skills, and data organization. Karakaya and Şata (2022) state that open-ended items in classroom exams require participants to respond freely, that different solutions are expected to be compared, and that these items should be preferred when focusing on higher-order thinking skills such as solving problems with multiple solutions.

The study conducted by Kintsch and Yarbrough (1982) reported that open-ended items provided more information about learning. Similarly, Kutlu (2004) states that in cases in which open-ended items are well structured, it is possible to determine whether a student can use multiple skills concurrently using a single item. Further, it should be kept in mind that open-ended items reveal the desired results, relying on new sample situations that may not be explicitly addressed in the classroom. According to Reiner *et al.* (2002), answers given in open-ended items should be formed rather than chosen, and it should be ensured that the answers comprise of at least a few sentences.

Nitko (2001) notes that the items in those books prepared for teachers and students have an easy structure that does not require considerable thinking. The researcher also refers to "structured and unstructured" problem situations whereby teachers should address in classroom assessment practices. Accordingly, *structured items* are very similar to those taught in the classroom (ordinary); however, *unstructured items* have a unique (unusual) structure. Students can understand and edit these unstructured items with what they have learned in the course, and they can see that these items may have multiple correct answers. Another aspect of open-ended items is that students must answer them in writing using their own power of expression based on the basic knowledge and skills they have acquired in the course. Such items should be designed in a way so that their answers must be given using consists of at least a few sentences. Here, it should be clear that, if an answer comprises a single one word, a few words, or a short sentence, then this will provide insufficient information as to whether the student can use the relevant skill in realistic situations.

Another point that teachers should pay attention to when writing open-ended items is the cognitive level at which the student is made to think. Studies in the literature point out that is the extent to which students use the information provided in textbooks by associating them with basic skills is more important than how much information they know (Airasian, 2001; Haladyna, 1997; Kutlu et al., 2017; McMillan, 2007; Popham, 2000, 2008). Therefore, the items should be related to the content of the course as well as the sub-dimensions of structures that require higher-order thinking such as problem-solving, analytical thinking, reasoning, and critical thinking. Thorndike (2005) emphasizes that mental processes related to the situation that is to be assessed should be well known before the responder starts to write their answers to open-ended items. He also suggests that a new material should be used at the root of the item during tis preparation, and that students should be presented with a different material than that which is taught to them in the classroom or in the textbook so that they can reproduce their knowledge.

In order for students to activate their higher-order thinking skills, they need to use the basic knowledge they have acquired and to transform it when responding to the open-ended item (Brookhart, 2010). At this point, teachers should attach as much importance to formative assessment practices that will reveal the level of acquisition of relevant life skills as they do to classroom teaching activities. Studies conducted since the end of the 20th century have revealed that means of measurement and assessment guides classroom learning. Previous studies have shown that learning success and quality increase when teachers use assessment and assessment activities correctly (Biggs & Watkins, Black & William, 1998, 2002; 1996; Clarke, 2001). Some studies have indicated that formative assessment has a positive effect on learning and

teaching processes (Crooks, 1988; Harlen, 2003; Stiggins & Conklin, 1992; Torrance & Pryor, 1998).

1.3. Formative Assessment and Feedback

The learning gains defined in curricula for determining student achievement should focus on mental skills and should be associated with life skills. In addition, the emphasis on higher-order thinking skills such as doing research, questioning, critical thinking, problem-solving, etc. necessitates formative assessment in improving student achievement in the classroom. Stiggins (1994) defines formative assessment as a continuous process that aims to improve education.

Especially since the 1960s, school programs have given more attention to improving student achievement. Bloom *et al.* (1971) refer to the improvement of student learning with the concepts of *formative evaluation* and *summative evaluation*. Summative evaluation focuses on assessing the level of student learning at various stages or at the end of the teaching process, and is mostly used for grading purposes. However, according to the formative evaluation approach, it is determined whether the students have the cognitive input (prerequisite) behaviors required for the learning process (at the beginning); learning deficiencies and difficulties are determined the end of the process. This process focuses on shaping student learning and assessing whether students have sufficiently learned the topics covered rather than on grading students.

Özçelik (2014) describes the monitoring of learning as "determining which behaviors expected to be learned in a unit have been learned, which ones have not been learned, and probably why they have not been learned at the end of each unit and completing the learning deficiencies in a timely manner by considering possible difficulties". He also emphasizes the use of formative tests to assess all those new behaviors that are expected to be learned in the unit in order to identify learning deficiencies, as well as possible difficulties leading to these deficiencies.

While students' learning regarding the level of knowledge (remembering) takes place in a short period, sometimes as short as a few class hours, the process of learning skills that enable them to use the same knowledge can take months or even years (Haladyna, 1997; Kutlu et al., 2017). Therefore, it is more important to monitor the skill, not form it. Monitoring skills that develop over a long period at critical stages and giving accurate and timely feedback to the student will contribute to the adoption of such skills at the desired level of competence. In this way, students can become aware of their strengths and weaknesses while using skills. For this reason, in this study the concept of *formative assessment* was used in the meaning of *monitoring-based assessment* in this study, and the conceptualization of monitoring learning by Özçelik (2014) was developed and enriched.

Stiggins (2002; 2005) emphasizes that it is necessary to move from the understanding of *the assessment of learning* to *the assessment for learning* in school education. Kutlu and Kula-Kartal (2018) state that the understanding of assessment for learning involves more-than-frequent testing of students and that, according to this understanding, assessment and teaching process should proceed in an intertwined manner Within this process students are not expected to perform better than other students, but are expected to focus on becoming competent in the knowledge and skills they are learning.

The key point in terms of classroom assessment is to focus on the process rather than the learning outcome and to internalize an approach that prioritizes feedback. Therefore, in order for students to reach the desired learning outcome, a monitoring-based/formative assessment approach where the process is kept under control comes to the fore, rather than a level of determination at the end of the teaching process. It is important to structure those assessments that are to be carried out during the process in a way that they are both interrelated whereby they both provide rich feedback on learning.

According to Harlen (2007), feedback given to the students during the learning process helps them to organize their learning. Bloom (1976) draws attention to an effective teaching service for students to reach mastery learning, and emphasizing four elements that affect the quality of this service: *pointing and explanation, participation, enrichment, feedback, and correctness*. Bloom particularly emphasizes *feedback and correctness*; this is because feedback helps students determine their performance expectations, evaluate their level of understanding, and recognize their misconceptions. According to De Cecco (1968), feedback involves comparing student achievement with a standardized measure of achievement and informing the student of the result. In addition, feedback can give clues as to which approach can contribute to correcting students' mistakes observed in the learning process, thereby increasing their success (Attali & Powers, 2009).

Feedback is a fundamental construct for many learning and teaching theories. Understanding the conditions for effective feedback should facilitate both theoretical development and teaching practices (Bangert-Drowns et al., 1991). Kulhavy and Stock (1989) state that providing feedback based on a task is most commonly applied psychological interventions that support student achievement. A comprehensive literature review on formative feedback by Shute (2008) shows that the basic premise underlying most of the research on the subject: "only when given correctly, feedback can significantly improve learning processes and outcomes".

Gedye (2010) suggests some structures and tools that can facilitate formative feedback. Within the scope of the present study, some suggestions for teachers are given below:

- Use portfolios that allow students' need for their self-reflection.
- Have students rearrange their work after giving feedback on their draft work.
- Involve students in the process of creating assessment criteria.
- Ask students to identify the strengths and weaknesses of their work regarding established assessment criteria before submitting their work.
- Use examples to help students understand the expected standards.
- Take time to discuss and reflect on criteria and standards in the classroom.
- Before students leave the classroom, have students make a list of how they will work with an action plan based on the feedback they receive.
- Ask students the types of feedback they find most helpful and ask them to explain strategies they would follow to improve their success.

An assessment approach supported by formative feedback should aim to associate knowledge students learn using key skills. Kulhavy et al. (1976) and Kulhavy (1977) argue that feedback that does not emphasize skills cannot go beyond identifying learning deficits. Therefore, it would be appropriate for feedback to be given in formative assessment to focus on the learning gains of the courses.

Kutlu et al. (2010) emphasize that teachers should consider both the *content (scope)* and *cognitive level* of the lesson when writing items based on the learning gains of the lesson. For this reason, teachers should give feedback by making determinations based on the following two situations in student responses: first, determine whether the student has learned the information about the course content and reveal what they have learned at the desired level; second, determine whether the skill representing the cognitive level is used at the desired level in the case and situation. One of the effective elements that plays a role in determining these two situations is the *item* used, while the other is the *rubric*. Cutting and Scarborough (2006) state that determining how well an individual learns depends on how well it is measured.

Scoring rubrics show those defined criteria within which a student response or task falls, and each criterion shows the transition from competent to weak levels of achievement according to

that task (Goodrich, 1997). Popham (2000) expresses the rubric as a reference scoring key that is used to evaluate the quality of student answers; however, Kutlu et al. (2017) note that a rubric is a scoring tool that shows according to which criteria a student's work is evaluated and to which level their performance will correspond. All these definitions indicate that rubrics provide detailed information about students' achievements from high to low levels. In this sense such rubrics are important in terms of drawing attention to what the students can do while scoring their answers to an item, or to what the student produces in responding or completing a performance task. In addition, learnings that each student scores regarding the rubrics correspond to the provision of important feedback to teachers about these students (Kutlu, 2004).

Miller *et al.* (2008) emphasize the reliability of the scores obtained from rubrics so that they can be used in the decision-making process. Kutlu et al. (2019) suggest that to ensure that rubrics provide reliable results teachers should examine the statements in the rubric and those answer categories to which the statements belong after the rubric has been prepared. The fact that teachers examine the response categories individually before scoring and receive opinions from other teachers in the relevant field may contribute to the reliability and validity of the scoring. McMillan (2007) emphasizes the advantage of creating a rubric before the administration of open-ended items and draws attention to the importance of preparing rubrics that include common criteria for scoring all answers.

1.4. Significance of the Study

Concepts of *formative evaluation* and *summative evaluation* introduced by Bloom et al. (1971) have played a role in the education systems of many countries, including Turkey. The concept of formative evaluation continues to be influential today and is widely used to overcome students' learning deficiencies and difficulties. This approach sees students as passive learners rather than active learners within the teaching and learning process, and focuses on what students have not learned rather than on what they have learned, as well as on their learning level in each case. Therefore, this approach mostly depends on content and repetition of content; additionally, it aims at shaping student learning in accordance with the content rather than observing the progress regarding student achievement.

From this point of view, it would not be wrong to argue that the *formative evaluation* approach has not been effective in developing the expected learning achievement in school education. However, since the last quarter of the 20th century, and especially since the 21st century, many societies have expected schools to educate students with higher-order thinking skills such as problem-solving, analytical thinking, reasoning, and critical thinking. It has been considered important to observe these skills, which develop over a long period of time, and to provide students with information about their mental strengths rather than their deficiencies. This study aims to explain to teachers how they can give feedback by using open-ended items in the formative assessment process and how they can improve student achievement by proposing a sample model.

2. METHOD

2.1. Procedure

It is emphasized in the previous sections of this study that student achievement can be considered as students' power to use the basic knowledge acquired in the courses to real-life situations. Accordingly, a sample open-ended item that can be used effectively while giving feedback in the process of formative assessment that has a counterpart in real-life, and a sample holistic rubric showing the scoring method of the aforementioned item were developed. It is suggested that the developed example should be examined by combining it with the example

presented in the study of Kutlu and Altıntaş (2021). Figure 1 shows the flowchart of the feedback that can be given in the formative assessment process.

Figure 1. *Flow chart of the feedback process.*

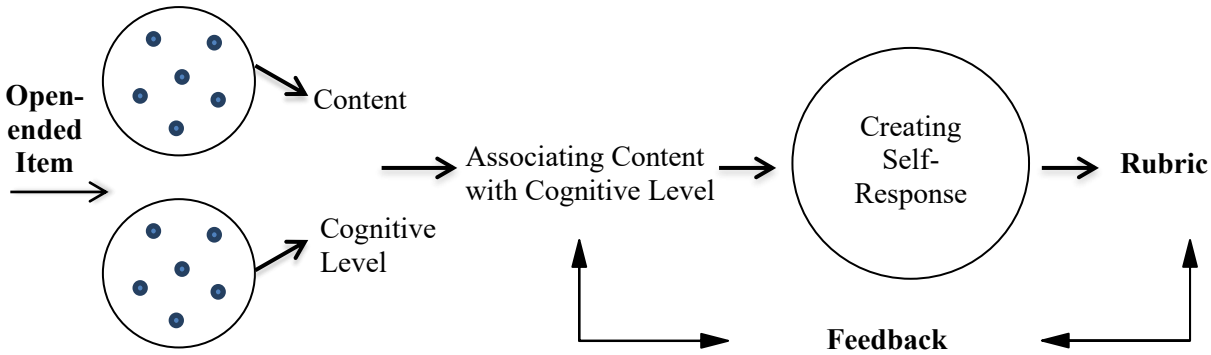

Figure 1 shows that students are expected to associate two dimensions with one another in order to give the expected answer to the feature measured by the open-ended item. As indicated in Figure 1, the student's ability to make this association depends on them having sufficiently learned the basic information about the content covered in the lesson, as well as them having acquired the skills of the relevant cognitive level in which they combine this information. For this reason, teachers should use case studies based on life situations that require the use of more than one piece of knowledge depending on the content in the feedback process that aims to improve students' learning achievement. Only in this case will teachers be able to determine both the extent to which the information is learned in the students' responses, as well as the extent to which cognitive skills will enable them to associate and use the knowledge in case studies based on real-life situations.

It is clear that students' responses will differ in the process wherein students can create their own answers. For this reason, it is important to determine those answers that are completely correct, partially correct, incorrect, or even unrelated, as well as those left blank in terms of observing the student and improving their success. Here, there are two dimensions that enrich the feedback: *the quality of the open-ended item* and *the fact that the rubric has been prepared with the expected competence*. The answer to an open-ended item usually requires writing one or more sentences. It is important that the answer is associated with one of the answer levels in the rubric in an unbiased way. Therefore, the accuracy and quality of the answer should be evaluated by a knowledgeable and talented teacher (Reiner *et al.*, 2002). To summarize, both the written item and rubric should be developed with certain accuracy and quality, and the answers should be scored by teachers who are equipped to use the rubric.

2.2. Sample Study

In order to facilitate the use of the explanations made in the previous chapters in classroom practices, *the model of giving feedback in the formative assessment process*, which is suggested in this study, is discussed through a sample study below. The learning outcome considered for the open-ended item is related to that of "the 6th grade Social Studies lesson which argues that solutions to a problem should be based on rights, responsibilities, and freedoms". The sample open-ended item consists of two parts: "situation" and "instruction". The situation part includes the problem that encourages the use of the basic knowledge learned in the lesson, makes the students think about the problem, and is as realistic as possible. Comparatively, the instruction part is that which asks the question depending on the situation. The instruction should be relevant to the situation, appropriate to the student's grade level, and should be clear and understandable.

One of the most important subjects of Social Studies lessons, which comes to the fore in interpersonal relations and daily life, is the relationship between the individual and society. The individuals' ability to lead a happy and peaceful life in society is related to them knowing the rights, responsibilities, and freedoms of both themselves and other individuals around them.

The concept of right refers to the authority of an individual to do something within the framework of certain rules and limits. Rights are also legally granted entitlements that have been given to individuals. The concept of responsibility refers to what must be fulfilled during when an individual exercises their rights; they are concerned with an individual bearing the consequences of what they do, must do, and actions they have undertaken and for which they are sometimes necessarily held accountable. Finally, freedom is the ability of an individual to do what they want without restricting other the freedoms of other people within certain limits; they are concerned with individuals making decisions according to their wishes and thoughts, independent of external influences (Şahin, 2019; TDK, n.d.).

These three basic concepts (right, responsibility, and freedom) need to be acquired by individuals at the relevant grade levels for the continuation of social life. These concepts should not only be taught to students at the descriptive level but also at the level of establishing their relationship with one another. If these skills are not adopted, necessary cooperation and solidarity among individuals living in society are not ensured, conflicts may arise between individuals, and there can be disintegration and dissolution in society in the future.

Table 1 shows an example of a formative assessment that reveals at which level life skills related to this important social issue should be addressed regarding the acquisition of classroom teaching activities. In the example shown in the Table, first the grade level, the learning field that constitutes the content and the achievement; then the cognitive level; and then the scoring method of the item were defined. The study by Kutlu (2004) was used when developing the writing style for each item. Care was given to ensure that the item was appropriate for the learning outcome, cognitive level, grade, and age level. Expert opinions were obtained once the item had been written and the rubric prepared: Three Social Studies teachers were consulted for *the scientific check*, two measurement and evaluation experts for *the psychometric check*, and one Turkish teacher and one English teacher for *the language and expression check*. These experts were asked whether the item was appropriate for the learning outcome, whether it was novel for students, whether it was appropriate for the grade and age level, about its power to represent the cognitive level, and whether the scoring key was arranged appropriately and accurately for the answers. Based on suggestions from the experts, the item and the rubric were then finalized.

Table 1. *An example of a formative assessment for a Social Studies course.*

Content Level	Grade Level	Cognitive Level	Scoring Method
Course: Social Studies **Learning Area:** Individual and Society ***Learning Gain*:** SS.6.1.5. argues that solutions to a problem should be based on rights, responsibilities, and freedoms	Middle school 6th grade	Problem Solving (Proposing a Solution to a Problem)	Rubric
Item: Classes 5-A and 6-B in a school have a physical education lesson at the same time, and students of both classes want to play basketball in their lessons. However, there is only one basketball hoop in the schoolyard. The teachers of both classes want students to talk to one another and find a solution to this problem within the framework of "rights, responsibilities, and freedoms". **Offer the students a suggestion to solve this problem.** Write your **suggestion by associating it with the concepts of** "rights, responsibilities, and freedoms".			
Answer:			

Concerning the open-ended item given in Table 1, it is expected for the students to offer a realistic solution to the problem and to associate this solution with the concepts of "right, responsibility, and freedom". The crucial point that the item aims to measure is the instruction part of the item: "Write your **suggestion *by associating it with the concepts of*** *'Right, responsibility, and freedom'*". If the instruction statement had been given only in the form of "*Offer the students a suggestion that will solve the problem*", it would have been difficult to question the correctness or incorrectness of the answers and, perhaps, it would have been necessary to accept all answers as correct. It would also not have been possible to know what background thoughts the student had when answering the item. The second part of the item is important in terms of showing whether the student has learned the concepts and whether they can associate these concepts with one another.

In order to improve student achievement, teachers need to be able to both monitor effectively and provide effective feedback. For this, it is inevitable to prepare a detailed rubric. McMillan (2007) emphasizes that teachers should create a rubric for administering the open-ended item and draws attention to whether the item should be scored holistically or analytically. Accordingly, Table 2 presents a holistic rubric prepared for the open-ended item in Table 1.

Table 2. *Holistic rubric for the sample item.*

Answers	Achievement Score
The Most Correct Answer	
The student proposes a solution to this problem within the framework of rights, responsibility, and freedom, and writes their suggestions by associating the solution with these three concepts. *Sample Answer:* I suggest that the two classes play basketball game together to solve the problem because it is the right of both classes to want to play basketball. However, if one class plays basketball the other class will not be able to play. In this case, the freedom of the second class will be denied. No one should hinder the freedom of another. Students need to take responsibility to respect one another's rights and freedoms. *Sample Answer:* To solve the problem, I suggest that one class should play basketball in the first half of the class hour and the other class in the second half. It is the right of the students of both classes to want to play basketball. However, if one class plays basketball the other class will not be able to play. In this case, the freedom of the second class will be denied. No one should hinder the freedom of another. Students need to take responsibility to respect one another's rights and freedoms.	10
Distant Correct Answers	
The student proposes a solution to this problem within the framework of the rights, responsibility, and freedom, and writes their suggestions by associating the solution with these two concepts. *Sample Answer:* To solve the problem, I suggest that one class should play basketball in one week and the other class in the other week because it is right for both classes to want to play basketball. However, if one class plays basketball, the other class will not be able to play. In that case, the freedom of that class will be denied.	8
The student proposes an indirect solution to this problem within the framework of the rights, responsibility, and freedom, and writes their suggestion by associating the solution with these two concepts. *Sample Answer:* I suggest that the two classes sit down, talk, and come to an agreement because it is the right of the students of both classes to want to play basketball. No student or class should hinder the freedom of another. They need to come to terms with one another by talking and taking responsibility.	6
The student proposes a solution with the help of someone else within the framework of the rights, responsibilities, and freedom, and writes the suggestion by associating the solution with the concept. *Sample Answer:* This is the teacher's responsibility. I tell the teacher and ask them to find a solution. The teacher should take responsibility and defend the students' rights.	4

The student proposes a solution based on coincidences without considering the concepts of the right, responsibility, and freedom and writes the suggestion by associating it with a concept. *Sample Answer:* My suggestion is that they flip a coin. Whoever gets the chance play. Let others respect their rights. No one should hinder anyone else's freedom.	2
Blank	0
Incorrect Answers	
The student writes an answer that is correct in itself but not a correct answer to the question. *Sample Answer:* I would say 6/B should play because they are higher grade level. *Sample Answer* I would say 5/A should play because they are lower grade level.	1
Irrelevant Answers	
The student writes a response that is not related to what have been taught. *Sample Answer:* Let them not play basketball, but study instead.	1

In the holistic rubric, a single point is given to the whole of the student's performance, and it is stated that it is necessary to focus on the whole performance by ignoring some minor errors in the performance. At the same time, the answers are considered holistically, and a score is given for each level after the students' answers are ranked from high to low (Kutlu *et al.*, 2017). Since rubrics describe response levels in detail, they allow more consistent scoring (Jonsson & Svingby, 2007). This increases both the validity of students' scores and of the feedback that will be given based on this determination.

In the development of the holistic rubric given in Table 2, *the most correct answer*, then *distant correct answers, blank, incorrect answers,* and then *irrelevant answers* were determined respectively. Sample student answers were given under each answer type. The score values defining the answers were as follows:

- 10 points for the *most correct answer,*
- 8, 6, 4, and 2 points for *distant correct answers,*
- 0 points for *blank answers,*
- 1 point for *incorrect* and *irrelevant answers.*

The most correct answer includes giving the expected answer to the item in full. Answers in this category are exemplary. Distant correct answers include partial accuracy, and they are scored high to the extent they are close to being the 'most correct'. An incorrect answer is logically correct but is not the correct answer to the question asked to the student. An irrelevant answer includes statements that are not related to the learning required to answer the item, or even to anything that has been taught. Nonsense and fabricated answers should be evaluated accordingly.

Scores in the rubric of the sample item are determined from *0* to *10* points. A blank answer is accepted as 0 because it indicates that the student has not answered; that is, absolute absence of an answer. However, incorrect and irrelevant answers are scored as 1 because they show that

the student had an idea, even though their answer is not accurate or correct. All response categories provide information about the student's achievement.

The most important indicator for teachers to use when deciding into which response category students' answers fall is the explanation of the sample answer and the sample answer itself. It is inevitable that students will respond to an open-ended item with different explanations. For this reason, the most appropriate answer level into which the student response falls should be determined during scoring. If it cannot be decided into which of the two answer levels the response falls, the higher answer level should be preferred in favor of the student. An examination of the rubric shows that the criteria that distinguish the answer categories from one another (the explanation above the sample answer) move away from the expected answers when moving from the most correct answer to the most irrelevant one. The fact that the answer categories move away from the most correct answer shows both what the student can do and what they cannot, compared with the previous answer.

For example, a student in the answer category corresponding to 6 points in Table 2 has correctly associated two of the concepts of right, responsibility, and freedom. In addition, the suggestion for the solution to the problem was not clear and direct; it was based on an indirect situation. In this case, it would be appropriate for the teacher to show the students in this group the sample answers in the most correct answer and ask them for more concrete examples. There are also situations that students in this group need to complete regarding the concept of rights, responsibility, and freedom. For this purpose, giving students additional reading passages and repeating the subject may contribute to their development.

In another example, a student in the answer category corresponding to 2 points in Table 2 has suggested a solution without considering the concept of rights, responsibility, and freedom, and was not able to associate the concepts with one another. This student's suggestion also did not provide a solution to the related problem. In addition, the student almost never used what they were supposed to have learned the lesson. The teacher should help this student by giving more reading- and writing-based activities and supporting them to improve their learning. First, this student can be asked to read about the concepts of right, responsibility, and freedom, and write examples of the problems they observe in real life.

The students in the incorrect answer category in Table 2 are those who gave answers that can be improved more easily by providing feedback. These students learned some of the information in the lesson; however, they gave a correct answer instead of the expected or measured feature in the related item; their lack of learning may have played a role in giving incorrect answers to the item. For these students, studies similar to those that should be conducted for the answer category corresponding to 2 points can be conducted. Teachers should take more serious measures based on monitoring the students who gave irrelevant answers. These students may have learning difficulties as well as learning deficiencies. It should be kept in mind that students with learning difficulties often experience problems such as comprehending what they have read or listened to and understanding the topics taught in the lesson. Teachers should regularly monitor those students who gave incorrect answers and those who have very low scores, especially those students who gave irrelevant answers.

3. DISCUSSION and CONCLUSION

Considering its role in the teaching and learning process, feedback is not currently being used as effectively as is desired in classroom assessment processes. In particular, the fact that teacher-made tests are based on short-answers, gap-filling, true–false, and multiple-choice item types in schools in Turkey can be seen as one of the important reasons behind this issue (Kutlu & Altıntaş, 2021). These item types are more efficient in measuring basic knowledge at a recall level, which develops over a short period; therefore, they provide stronger feedback on whether

this knowledge has been learned. Today, school programs are prepared to be skill-based, and school practices focus on developing students' higher-order thinking skills. For those skills that develop over a long period of time, schools should adopt an approach based on monitoring rather than formatting. Using open-ended items serves the purpose of improving understanding that requires monitoring through the provision of effective feedback in the meaningful parts of the learning process.

Studies emphasize that open-ended items are more effective than other item types in measuring higher-order thinking skills (Badger & Thomas, 1992). Brookhart (2015) states that open-ended items give individuals the opportunity to use their higher-order thinking skills and allow them to express their thoughts more freely. Similarly, Kubiszyn and Borich (2003) state that open-ended items play a more important role in making inferences about the results of complex higher-order cognitive skills, such as problem-solving, analysis, and evaluation. Comparatively, Karakaya and Şata (2022) note that open-ended items develop alternative ways of thinking in students considering that they are prepared at the level of analysis, evaluation, and creation according to Bloom's classification, as well at the levels of problem-solving, critical thinking, and creative thinking according to Haladyna's classification. Therefore, this study used an open-ended item developed based on a real-life situation to provide more effective feedback in the formative assessment process.

In their study *Prospective Teachers' Views About Formative Assessment*, Metin and Özmen (2010) examined the materials developed for the candidates. They gave feedback to each student about the mistakes and deficiencies, and asked them to set the homework again. At the end of the study, the candidates stated that they had noticed their shortcomings and strong aspects, directed their studies, and learned to evaluate themselves thanks to the feedback. In another study, Aydın (2011) scored the answers of 5th grade elementary school students to open-ended items in a mathematics lesson using rubrics, and gave feedback based on these rubrics. The study reported that the application based on giving feedback increased the success of the mathematics course and provided the students with the opportunity to see their strengths and weaknesses.

Similarly, a study by Sabilah and Manoy (2018) used open-ended items with feedback for effective learning of mathematics. In addition, they aimed to describe teachers' learning management, students' activities, and learning achievements. At the end of the study, it was seen that the teachers applied the learning management well, that each student participated in the activity, and that student success was fully achieved. It was also concluded that learning mathematics was more effective when using open-ended items with feedback.

Shute (2008), who examined the studies on formative feedback, states that feedback has been widely discussed in the literature and draws attention to the fact that these studies have many contradictory findings and that, furthermore, there is no consistent learning outcome model for feedback. The author states that this may be caused due to the fact that feedback is mostly used in the teaching process (during classroom activities) and result-oriented assessments (for level determination). This also shows that new suggestions are needed to contribute to the improvement of classroom achievement. Unlike the studies reviewed by Shute (2008), the present study focusses on students' skills that develop over a long period and emphasizes feedback in the formative assessment process. As Torrance and Pryor (1998) report, the important point that should be considered in the learning and teaching process is the integration and continuity of formative assessment within teaching processes.

In their study conducted in the United Kingdom, Harlen and James (1997) draw attention to a different point; they state that the differences between formative and summative assessment approaches in school practices and official documents have disappeared, and that all determinations made by teachers are based on the assumption that they are formative. These

researchers argue that there is a need to find a way that will maintain the functional and feature differences between these two assessments and also to link them to one another. Harlen and James (1997) state that this uncertainty will negatively affect the monitoring and feedback processes. Gedye (2010) states that there are several ways in which the quality of feedback can be improved in the formative assessment process. This includes giving feedback as soon as possible, being related to predefined assessment criteria, and giving tips to help students understand how to improve their work.

The present study used the suggestions that increase the effect of feedback in the formative assessment processes. Consequently, it is hoped that the case study model discussed in the present study will contribute to the development of classroom learning success as a result of its use in future studies.

Declaration of Conflicting Interests and Ethics

The author declares no conflict of interest. This study complies with research publishing ethics. The scientific and legal responsibility for manuscripts published in IJATE belongs to the author.

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