

Pre-service science teachers' opinions about using the feedback process in the preparation of teaching materials

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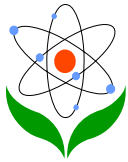
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Abstract

Practical courses are very important in teachers' professional training. It is important that teachers learn professional knowledge and skills by personal experience, and it can increase the quality of their teaching. The accuracy of the practice should be considered for the practical studies of pre-service teachers. When the practices do not include feedback, the connection between theoretical information and practice is not successfully established, which leads to performances to be taught adequately, but in fact insufficiently. The aim of this study is to determine pre-service science teachers' opinions about the use of feedback during the preparation of teaching materials. This is a case study, a qualitative research method. The study data were collected using an

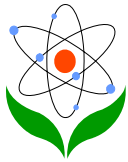


opinion form which included open-ended questions as well as interview questions. Pre-service teachers' written explanations to the open-ended questions were analyzed using content analysis, a qualitative analysis method. In addition, the study used descriptive analysis to assess the data that were collected during interviews with the purpose of obtaining further information. The research results show that a majority of teachers had positive opinions about feedback. They stated that feedback helped them to recognize and correct their mistakes and deficiencies, enabled meaningful and permanent learning, contributed to in-class communication and could be useful in all stages of formal education.

Keywords: Feedback, Formative assessment, Pre-service science teachers

Introduction

Rapid and innovative changes in science and technology in the twenty-first century have both stimulated mandatory changes and improvements in the education system and generated significant alterations in individuals' and societies' perspectives to and expectations from education (Oğuz, 1993). Quality in education, in other words, a qualified education that suits the conditions of our time requires a long time to be established. It also makes it necessary that research in a number of study areas is maintained using standard methods. These studies are necessary in all stages of training, and they may both solve instructional problems and provide continuous improvement. One of the most important ways to increase the quality of education is assessment, which is the control mechanism of education (Taras 2002, 2003). Assessment is the most important element that shows the achievement level of educational goals and the success of all the elements in the learning process which are students, teachers, teaching methods and teaching materials. There are two important types of assessment in use. These are summative assessment, which is based on assessing what students have learned at the end of course units, and formative assessment, which is based on determining students' learning needs (OECD, 2005; Liu and Carless, 2006). Recent studies have demonstrated the inadequacy of the summative assessment, which has been widely used for a long time, and requires students to meet predetermined standards to earn their diplomas (OECD/CERI, 2008). Formative assessment is an alternative that makes students responsible for their failure in continuing their education. Formative assessment is based on the principle of determining students' learning needs and teaching them



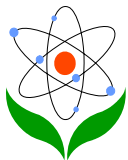
with their needs in mind. According to Shute (2007), the main goal of formative feedback is to strengthen students' knowledge, specific skills, understanding in certain contents, and general skills such as problem solving. These aspects of formative assessment will improve the quality of learning (Higgins, Hartley and Skelton, 2002).

Feedback is a part of formative assessment. It is also the focus of this study. Feedback is a strong mechanism for increasing motivation and learning (Erişen, 1997; Retna and Cavana, 2009). Feedback informs students about the strengths and weaknesses of their performances, and thus makes their future studies more productive (Weaver, 2006; Brown, 2004). Gibbs and Simpson (2004) claim that feedback is important when it is understandable, timely and is delivered in a style that stimulates students. Feedback is a type of advice that is given to improve current and future studies. It may also be described as a justified explanation of students' scores that focuses on learning (Carless, 2006; Gibbs and Simpson, 2003).

According to Nicol and Macfarlane-Dick (2006), proper feedback provides these benefits:

1. It helps describe a successful performance with the assistance of goals, criteria and standards.
2. It facilitates the development of self-assessment for learning.
3. It gives high-quality information to students about their own learning.
4. It improves communication between peers and between teachers and students.
5. It enhances positive motivational beliefs and self-esteem.
6. It gives opportunities to fill in the gap between current and desired performances.
7. It provides teachers with the information that will help them plan and design their instruction.

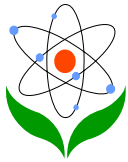
Borophy argued that feedback should help students evaluate their progress toward goals, understand their mistakes and correct their errors (Demir and Bedir, 2005). In an environment where feedback is not used, students may not understand what is expected of them and not perform as expected. If students fail to perform as expected, providing explanatory information about deficiencies and errors, or feedback, will increase their ability to do so. It can also increase their interest and motivation since it will enable them to learn and supervise their learning (Sönmez, 2007; Tok, 2007).



Many studies have shown that feedback has a strong effect on the learning process (Black and William, 1998; Hattie and Timperley, 2007). Jones (2005) found that it is necessary to provide feedback to learners to make progress in a specific activity. He showed that being given feedback to improve their current tasks was very valuable for learners, and that they perceived it as an excellent motivator. Weaver (2006) found that students believed that feedback was valuable, and that their teachers' comments were very beneficial. However, students also said that feedback from their teachers would not contribute to their learning when it was too general and unclear, provided little guidance, focused on negative behavior and was not associated with evaluation criteria. Demiraslan and Çevik (2014) found that students who received and provided feedback tended to have positive perceptions of it. The students said that the process of receiving and providing feedback was beneficial, effective and productive. They also said that they had the opportunity to recognize and eliminate their mistakes and deficiencies, and acquire new perspectives.

Burnett and Mandel (2010) studied praise and feedback in primary school classes, and found that teachers mainly praised their students without any goals, while it is much more beneficial for students to receive feedback about their abilities or efforts to accomplish a task. Another study of the effect of feedback used open-ended questions to prove that instant feedback has a significant positive effect. The participants stated that their responses based on feedback, which they considered a second chance, were better than their first responses to open-ended questions (Attali and Powers, 2008). Attali, Laitusis and Stone (2015) determined that feedback based on open-ended questions, rather than the multiple-choice questions, was more beneficial. This was explained by the concept of responsibility that requires effort, and it was found that open-ended questions forced students to think more.

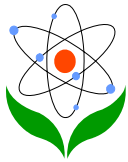
The results of a study by Higgins, Hartley and Skelton (2002) indicated that students read their teachers' comments and valued them. They found that the students were internally motivated despite being aware of the importance of scoring, and they tried to learn from feedback that could help them to understand the subject comprehensively. The same students said that an environment where feedback was only given as approval of correct answers and achievement scores were used as external motivation was not suitable at all. Liu and Carless (2006) demonstrated that a majority of the instructors and students in higher education did not adopt the peer assessment methods that use scoring. The researchers suggested using strategies which required peer feedback in courses so that scoring is not the primary concern.



Another study of higher education found that students cannot make progress without sufficient personal feedback about their learning since they are unable to determine how much progress they had made towards achieving their learning goals and knowledge and skill acquisitions (Bose and Rengel, 2009). An empirical study of formative assessment embedded in the curriculum and the effect of the classroom process quality examined floating and sinking, two subjects in the science curriculum, and found that formative assessment embedded in the curriculum and the classroom process quality encouraged students to learn (Decristan et al., 2015). Finally, Heritage (2007) referred to a very important issue that coincides with the aim of this study. According to Heritage (2007), it is necessary to revise teacher training programs in order to make formative assessment a complementary part of professional teaching. All pre-service teachers should graduate from the programs that include the information about the evaluation of students' learning. Teacher trainer should have pre-service teachers gain in-class experience to learn the information and skills which combine instruction and evaluation in framework of teacher training programs.

The positive effects of feedback on learning have already been proved by many studies. This study used feedback in the training of pre-service teachers. Practical courses are very important in teachers' professional training. Teachers who learn knowledge and skills by personal experience can increase the quality of their teaching. Practical studies in teacher training should be evaluated for their appropriateness. The connection between theory and practice is not established successfully in practical studies that do not include feedback. Thus, many performances are thought to be adequate, but are in fact insufficient. Since theory and practice are required study areas in teacher training, pre-service teachers' professional formation is thus greatly enhanced by face-to-face and written feedback. They can use the feedback process they see in their undergraduate education in their professional lives to enhance the quality of their instruction. This study aimed to examine pre-service science teachers' opinions about the use of feedback in the preparation of course materials. In context of the research problems, the study aimed to derive information about both the use of feedback in teacher training and the generalizability of feedback in formal education by tackling pre-service teachers' opinions about the use of feedback. The researcher believes that the study results will contribute to studies of the enhancement of quality standards in teacher training.

Here are the research problems:



1. What do pre-service teachers think about the use of feedback in material preparation process regarding its “contribution to their learning”?
2. What do pre-service teachers think about the use of feedback in material preparation process regarding its “advantages”?
3. What do pre-service teachers think about the use of feedback in material preparation process regarding its “disadvantages”?
4. What do pre-service teachers think about the use of feedback in material preparation process regarding its “preferring to use in professional life”?

Methodology

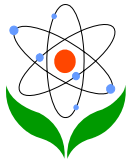
This research was designed as a case study, a qualitative research design. The most fundamental quality of case studies is the comprehensive examination of a case or multiple cases (Yıldırım and Şimşek, 2008). Moreover, Büyüköztürk et al. (2012) claimed that a case study is a research that describes the essential elements of a certain entity based on place and time. Johnson and Christensen(2012) defined case study research simply as research that provides a detailed account and analysis of one or more cases. The case investigated in this research is using the feedback process in the preparation of teaching materials. According to Johnson and Christensen(2012); a case not only is an object or entity with a clear identity (e.g., a group, a person, a classroom, or an organization) but can also include an event (e.g., campus protest), an activity (e.g. learning the play softball) or a process (e.g., becoming a professional teacher during one’s first year of teaching).

Study Sample:

This study was conducted with 46 pre-service science teachers who were juniors in the education faculty of a public university in the west of Turkey’s Black Sea Region in the 2015-2016 academic year. The pre-service teachers were between the ages of 20 and 22. Of them, 32 were females and 14 were males. They were in their third year and took the course of Instructional Technologies and Material Design.

Operations:

This study was conducted in the Instructional Technologies and Materials Design course, which is taught in the first semester of the junior year in the science teaching program. The course requires the pre-service teachers to prepare six two-dimensional teaching materials (pencil and paper) in pairs every week for a science subject of their choice. These teaching materials are worksheets, structured



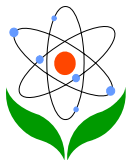
grids, diagnostic trees, concept maps, concept networks and meaning analysis tables. The researcher created rubrics for grading each kind of teaching material considering the criteria for the qualities of the material after consulting expert opinion. These rubrics were distributed to the pre-service teachers before preparing the teaching materials to guide their efforts. Afterwards, the teaching materials created by the pre-service teachers were evaluated by the researcher once each week. During the evaluation process, the participants were given feedback about their work in written form and in face-to-face conversations, which was suitable for the teaching material preparation principles and the qualities of the teaching materials. When providing feedback, the researcher stuck to the rubrics and scored the teaching materials first. The pre-service teachers received verbal and written feedback, and saw their initial grades and were given one week to revise and improve their teaching materials based on feedback. At the end of the week, the pre-service teachers resubmitted their teaching materials. The researcher reevaluated them and gave them final grades. This process continued for six weeks.

Data Collection Tools:

In this study, the data were collected using an opinion form including open-ended questions as well as the interviews held with the pre-service teachers. The opinion form was created by the researcher in consistency with the research problems with the purpose of receiving pre-service teachers' opinions about the use of feedback. The content validity of the form was confirmed by the experts, and it was administered to all pre-service teachers in 45 minutes at the end of the implementation process. The other data collection tool of the study was a collection of questions that were asked to 10 students (7 females and 3 males) in the study sample during the interviews. The interview questions were prepared in context of the research problems, and were asked to some of the pre-service teachers during the interviews. These are comprehensive questions to make an in-depth analysis of the research problems. Some of these questions, for which expert opinions were received, are as follows:

Question 1: What do you think about the feedback being advantageous in objective assessment?

Question 2: What do you think about the effects of feedback on student-teacher communication?



Data Analysis:

All questions were analyzed using content and descriptive analysis methods. The written answers of the pre-service teachers to the open-ended questionnaire were analyzed using the content analysis method, which mainly aims to find concepts and relationships to explain the data (Yıldırım and Şimşek, 2008). Categories were determined first according to the open-ended questions in the questionnaire, which are feedback's contribution to learning, advantages, disadvantages, and preferring it in professional life. Every participant has more than one opinions on each category. These opinions were analyzed using content analysis method to determine keywords. Frequency values were found according to the repetition frequency of these opinions of the pre-service teachers. Keywords are the significant parts (a word, sentence, paragraph etc.) included in the data and form the basic analysis unit in content analysis (Yıldırım and Şimşek, 2008). In some cases, phrases were used to specify the context in which these words are used, and the frequency values were put in an order from the highest to the lowest. The data were analyzed using two different raters. Their Miles-Huberman reliability value (Miles and Huberman, 1994) was calculated as 85.18. The data obtained from the interviews conducted with 10 pre-service teachers were analyzed using the descriptive analysis, which aims to submit the opinions of the interviewed or observed individuals to readers through direct quotations to conspicuously reflect them (Yıldırım and Şimşek, 2008). The findings were obtained through direct quotations from the data obtained from the interviews. The pre-service teachers' name were coded such as the "Pre-Service Teacher 1 (PST1-).

Findings

This section will examine the opinions under the themes determined using the research questions.

1. The pre-service teachers' opinions about the theme of feedback's contributions to learning.

The pre-service teachers had positive opinions on the use of feedback in preparation of material in terms of its contribution to learning seeing and correcting their errors about the materials they prepare and thereby ensure a significant and permanent learning were the most emphasized opinions.

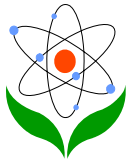
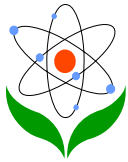


Table 1 presents the data associated with the first research question.

Table 1: The results of the content analysis of the pre-service teachers' opinions about the theme of feedback's contributions to learning.

Keywords	f	Keywords	f
Recognizing errors	33	Distinctive thinking	3
Correcting mistakes	25	Improving oneself	2
Meaningful learning	18	Synthesis	2
Eliminating deficiencies	7	The reflection of learned knowledge on performance	2
Permanent learning	6	Writing the acquisitions	2
Experience	5	Thinking deeply	2
Creativity	5	Eliminating misconceptions	1
Doing research	4	Doing interpretation	1
Communication (teacher-student)	4	Analysis	1
Recognizing and correcting ambiguities	4	Broad thinking	1
Approaching excellence (quality)	4	Objective criticism	1
Instant feedback	4	Effective use of time	1
Production of new ideas	4	Reviewing the knowledge	1
Being aware of responsibilities	4	Putting original ideas into practice	1
Achievement	4	Making students think	1
A second chance	3	Unique studies	1
Discovering details	3	Breaking the ice with the course	1
Associating the course with daily life	3	Learning the source of the mistake	1
Effective group work	3	Enjoyable	1
Increasing attention	3		

Table 1 shows that the pre-service teachers' most commonly held opinion was that the use of feedback in teaching materials preparation helps them to recognize and correct mistakes. Here are some of the pre-service teachers' (PST) opinions about this:

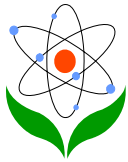


PST1: *“If the purpose of the study is to teach something, then mistakes should definitely be corrected.”*

PST2: *“It helps us to correct the concepts that we understand or express inaccurately.”*

Another pre-service teacher used a different approach, and said: *“In this process, we see that the things that we think we know and do correctly are actually incorrect”* (PST3). This shows how effectively feedback prevents incorrect learning. Table 1 also shows that the students think that feedback contributes to meaningful and permanent learning. One pre-service teacher said: *“In this process, we try to correct our mistakes and learn at the same time. So, the feedback process enables to achieve permanent learning”* (PST4). Another student who said that a feedback should not only be a grade also said that: *“The use of feedback definitely increased the quality of learning. If we were merely informed about our grade after the assignments, it would not add to our knowledge”* (PST5). Some students said that it was absolutely necessary to eliminate deficient learning to be able to learn something new.

Table 1 shows that feedback is also beneficial to professional experience, establishing communication between teachers and students and objective criticism. One student expressed this opinion by saying: *“To me, learning by practicing provides more permanent, solid and unforgettable knowledge. What’s more, this process makes us aware about the kind of attitude we should have when criticizing something. For instance, I am learning how to be more realistic and objective when I make a criticism. This helps me to recognize my mistakes and deficiencies more easily”* (PST6). This opinion shows that teachers’ objective attitudes towards students’ performances persuade them about their mistakes and deficiencies. Some students said that feedback contributes to distinctive thinking and producing new ideas (Table 1). During the interviews, one student said: *“In my opinion, being given feedback during the learning process corrects our mistakes and misconceptions and helps us comprehend new information better, which leads to full learning. It also makes it possible to discover more distinctive and original ideas. So, our creativity is enhanced by such an environment”* (PST7). Another student described working more on an insufficient teaching material and eliminating its deficiencies instead of throwing it away, which is important because the student recognized that every effort can be improved even if it is deficient.



2. The pre-service teachers' opinions about the theme of feedback's advantages.

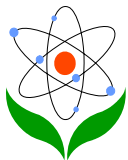
The pre-service teachers believed that the use of feedback in preparation of materials had many advantages. The most emphasized advantages were obtaining information about errors, seeing their deficiencies and complete them, and permanent learning.

Table 2 presents the data associated with the second research question.

Table 2: The results of the content analysis of the students' opinions about the theme of feedback's advantages

Keywords	f	Keywords	f
Information about errors	20	A second chance	2
Permanent learning	18	Changing the teacher's image in students' minds in a positive way	2
Correcting mistakes	15	Enhancing motivation	2
Recognizing and eliminating deficiencies	13	Being aware of the expectations of the teacher	2
Comprehension	10	Maintaining interest in the course	2
Knowledge in the study area	9	Multidimensional thinking	1
Conveying the subject effectively	9	No repetition of mistakes	1
Professional experience	5	Quality in education	1
Prevention of conveying incorrect knowledge	5	Doing research	1
Challenging process and excellent outcome	5	The benefit of instant feedback	1
Learning about teaching material preparation	3	Doing interpretation	1
Practical learning	3	Improving oneself	1
Awareness	3	Creativity	1
Communication	2	New ideas	1

Table 2 shows that most of the pre-service teachers thought that feedback's greatest advantage was providing information about the mistakes in the teaching materials they prepared. They also stated that the process was advantageous in terms of correcting mistakes, eliminating deficiencies and providing permanent learning. One



pre-service teacher said: *“People achieve permanent learning by recognizing their mistakes and inadequacies. Thanks to the feedback process, I don’t have any regrets such as, ‘I wish I wrote this, too’”* (PST1). It is important that the pre-service teachers said feedback added to their knowledge about their study area, prevented the conveyance of incorrect information due to the teacher and helped them gain professional experience at the same time. Here are four pre-service teachers’ opinions about these points:

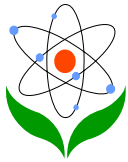
PST2: *“The feedback process gave me an advantage in directing students towards a pre-determined learning goal.”*

PST3: *“To me, this process had many advantages and helped me improve myself. It taught me to write the acquisitions of the teaching material to be prepared, something about which I had little knowledge or ability.”*

PST4: *“Besides learning, this process affected my opinions about how to teach. So, I think this process changes students’ perspectives on the teacher because students are always like teachers more if they explain errors and give students a second chance by showing how to fix them instead of handing you your exam paper and forgetting about it because you got a low grade.”*

PST5: *“A teacher can convey accurate information to students in an incorrect way. In the feedback process, the teacher has the chance to recognize this mistake and convey the information in the correct way. Or maybe the teacher has forgotten to teach information in the lesson. This information will be presented thanks to feedback.”*

Table 2 shows that pre-service teachers think that feedback is challenging and requires a lot of effort, but that it helps them to approach excellence. They also said that they had practical information and experience about how to prepare teaching materials. One pre-service teacher said: *“It is not enough to know that something you have done was not true or insufficient. When there is no feedback, we complete the activities without correcting errors and eliminating problems. We only learn that there is incorrect or insufficient information. We do not learn how to eliminate it or correct the error”* (PST6). As implied by the pre-service teachers’ opinions, students will recognize errors and deficiencies in learning, and accordingly, they will have experiences which will help them accomplish their tasks in the best possible way. Another advantage of feedback is enhancing motivation. Here is one pre-service



teacher's opinion about this point: *“Feedback gets students to do their homework better. When students do their homework better, this positively affects their motivation and thus their achievement in lessons”* (PST9).

Table 2 shows that the pre-service teachers thought another advantage of feedback was multidimensional thinking, which will establish communication between teachers and students and positively affect the lessons. Here are some of the pre-service teachers' opinions about this:

PST7: *“I think giving feedback may reduce quarrels between teachers and students because the students may react to the teacher when they get low grades, and lose interest in the course, but feedback makes students who recognize their mistakes try to correct them on their own.”*

PST8: *“This process has enabled us to think in a multidimensional way. It also helped us to develop different perspectives on a certain event and create different solutions. So, I have begun to like this course better than the others.”*

3. The pre-service teachers' opinions about the theme of feedback's disadvantages.

Most pre-service teachers believed that the use of feedback process in preparation of materials had no disadvantages. The most stressed disadvantages were its being time-consuming and exhausting.

Table 3 presents the data associated with the third research question.

Table 3: The results of the content analysis of the pre-service teachers' opinions about the theme of feedback's disadvantages.

Keywords	f	Keywords	f
No disadvantages	18	Failure anxiety	2
Being time-consuming	10	Having a lot of homework	2
Exhausting the pre-service teachers	6	Making a mistake	1
Giving up	4	Misconception	1
Being elaborative	2		

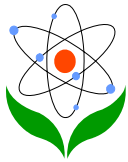


Table 3 shows that a majority of the pre-service teachers said that feedback had no disadvantages. On the other hand, some pre-service teachers said that the time consuming nature of the feedback process was its biggest disadvantage. Here is one such opinion: *“I think the process took a very long time because the teaching materials need to be organized one by one and this requires a lot of time”* (PST10). The pre-service teachers said that the feedback process was exhausting for them. One pre-service teacher said: *“The teacher may be exhausted by the feedback process”* (PST5), which shows that the pre-service teacher perceived the process as exhausting for teachers, too. The students made revisions every week based on written and verbal feedback about their teaching materials and their initial grades. Then, they were given final grades for the teaching materials they improved or revised. It is probable that this process exhausted some pre-service teachers and caused feelings of failure anxiety and wishing to give up due to being unable to present an excellent product in the first stage and to use their second chance well. One participant said: *“Not being able to achieve the desired outcome even at the end of the feedback process may cause students to give up”* (PST7). Table 3 shows that some other pre-service teachers said it was a disadvantage that the teaching materials needed to be prepared comprehensively and that there was a lot of homework.

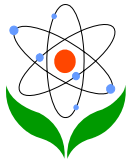
4. The pre-service teachers' opinions about the theme of feedback preferences in professional life.

The pre-service teachers had positive opinions on the use of feedback in terms of preferring it in professional life. The most highlighted points were that the process provides effective and significant learning, helps them to see their errors clearly, and ensures the permanence of the information learned.

Table 4 presents the data associated with the fourth research question.

Table 4: The results of the content analysis of the pre-service teachers' opinions about the theme of feedback preferences in professional life.

Keywords	f	Keywords	f
Effective and meaningful learning	18	Learning no longer being an obligation	2
Recognizing students' mistakes clearly	10	Continuous communication	2
Permanent learning	9	Instant feedback	2
Comprehensive learning	9	An enjoyable environment	2



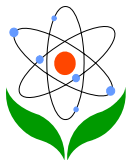
A second chance	7	Achievement	1
Saving time	5	Teacher acting as a guide	1
Reducing mistakes	5	Correcting information which was conveyed incorrectly before	1
Thinking	5	Written and verbal feedback being effective	1
Self-assessment	4	Guidance	1
Eliminating the deficiencies	4	Communication	1
Accurate (objective) evaluation	3	Affects homework and projects	1
Practical learning	3	Awareness of the student	1
Doing research	3	Individual learning	1
Improving oneself	3	Creative thinking	1

Table 4 shows that the pre-service teachers' most commonly held opinion of feedback in professional life is that it enhances effective and meaningful learning. Two pre-service teachers said:

PST9: *"I will use feedback in my professional life. I think it will be beneficial for my students to use it to recognize their deficiencies and achieve effective learning."*

PST10: *"I will definitely use it in my professional life. I think feedback improves the meaningful learning process, and students improve themselves this way."*

Table 4 shows that pre-service teachers thought feedback contributed to the achievement of full and permanent learning, helped teachers see students' mistakes and helped students recognize their own errors. Here are some of their opinions about this from the interviews: *"Feedback can influence students' learning. It provides continuous communication between teachers and students. Students see their mistakes and see what they should do, and the teacher acts as a guide (PST2)."* This opinions shows that the pre-service teachers accept the ideas of student-centered learning, communication between teachers and students helping to achieve learning and establishing communication using feedback. Here is another opinion about the recognition of mistakes: *"I will use the feedback process in my professional life because I think my students should recognize their mistakes and learn how to correct them right away" (PST4).* This opinion is important since it



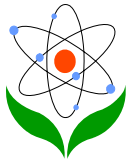
shows that feedback importantly allows students to recognize and correct their learning mistakes on their own.

Table 4 also shows that some pre-service teachers regard feedback as a way of saving time for learning and a second chance. One pre-service teacher said: *“I will use feedback in my professional life. It is necessary to give students a second chance to get them to learn by recognizing and correcting their mistakes”* (PST6). Another pre-service teacher said: *“I would like to use feedback in my professional life because I think it is better to give another chance to correct a mistake instead of being judged for that mistake”* (PST7). These opinions are important evidence that learning is achieved in a certain period of time, and that students see feedback about their work as a second chance.

One pre-service teacher provided this opinion about written and verbal feedback: *“In my professional life, giving written and verbal feedback together would help me ensure that what I want to explain and teach be more permanent. I correct the incorrect information that students have, and I aim to minimize my students' mistakes”* (PST3). Other pre-service teachers thought that feedback made their classes more enjoyable and improved communication with their students. One pre-service teacher said: *“My communication with my students would be stronger. They would try to correct their mistakes by learning individually. So, I would be able to spare time for each student. None of the students would think that they received less attention than the others”* (PST5). These opinions show that communication between teachers and students will help students recognize and correct their mistakes, which will make them to learn. It also indicates that feedback will ensure that teachers will show equal personal attention to each student.

Conclusion, Discussion and Suggestions

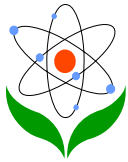
The study data show that a majority of the pre-service teachers held positive opinions about the use of feedback in the preparation of teaching materials. Pre-service teachers' positive opinions about this process include the recognition and correction of mistakes, eliminating the deficiencies, provision of meaningful and permanent learning, improvement of the communication between teachers and students, making pre-service teachers learn about their study area and gain professional experience, and enhance distinctive thinking, in other words, creativity. Some pre-service teachers also thought that feedback prevented teachers from conveying inaccurate



information, and gave students a positive perspective on their teachers since it provided objective evaluation. The pre-service teachers also asserted that they would prefer to use this type of evaluation in their professional lives. Their reasons for making this decision were that it provides effective learning, enhances interest in and motivation for the course since the students see it as a second chance. They also felt that mistakes would be minimized by a process that includes students and improves communication between teachers and students. Although a majority of the pre-service teachers said that the feedback did not have any disadvantages, some participants said that this process was time-consuming and exhausting. The results of this study are supported by those of other relevant studies.

Demiraslan and Çevik (2014) determined that the students who gave and received feedback tended to have a positive perception of it. The students considered it to be beneficial, effective and productive. They said that they were able to recognize and correct their mistakes, eliminate deficiencies and learn new perspectives. Another study found that the students read and valued their teachers' comments. It found that the students were internally motivated although they were aware that grades were important, and that they tried to learn from feedback that helped them to understand the subject comprehensively (Higgins, Hartley and Skelton, 2002). Burnett and Mandel (2010) studied praise and feedback in primary school classes and found that teachers mainly gave general praise to students without a specific purpose, while ability- or effort-related praise about accomplishing a task given to students would be more beneficial for them. In a study by Weaver (2006), students stated that feedback was valuable to them. However, they also said that feedback from their teachers did not contribute to their learning when it was too general and unclear, provided little guidance, focused on negative behavior and was not associated with evaluation criteria. Other studies' results are consistent with those of this study. Attali and Powers (2008) found that feedback helped learners to identify their expectations of their own performance, determine their comprehension levels and become aware of their misconceptions. It also gives them clues about new perspectives on correcting their mistakes and improving their performance. According to Gibbs and Simpson (2003), feedback should be understandable for students and make them become more intellectual.

This study was conducted in the Instructional Technologies and Materials Design course, which is a compulsory course in all branches of teaching in education faculties and includes obligatory practice. In context of this course, the pre-service



teachers, who were more active in cognitive and kinesthetic terms than they would be in a theoretical course, learned knowledge and skills. The suitability of these practices for the prerequisites of their tasks is the point that should be considered by pre-service teachers in their practical studies. In practical studies without feedback, the connection between theory and practice is not established successfully, which leads to faulty products or performances. Another risk for these studies is using the internet, which pre-service teachers prefer as a short cut when they do not receive sufficient feedback. Although the internet is seen as an important source of information and the communication network of our age, it also includes a lot of unreliable information sources. For this reason, feedback is an important type of evaluation that can eliminate inappropriate ways of learning and theoretical errors caused by the use of the internet. In addition, the pre-teachers' positive opinions about the use of feedback in their professional life indicates the information about the generalizability of this process for formal education.

The study results suggest that:

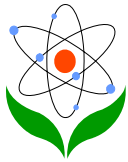
Teacher training should involve formative evaluation, which includes effective feedback, in addition to summative evaluation. It should also be ensured that pre-service teachers personally experience feedback's effectiveness. Like pre-service teachers, working teachers may also be offered in-service training programs to improve their feedback knowledge and skills and other types of formative evaluation.

Feedback can be used at all levels, from primary to higher education, and different forms of feedback can be used for different courses.

Information from feedback is important for both students and teachers. Educators can use this information to organize learning environments and activities.

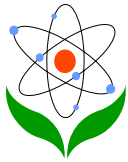
Since feedback requires the use of information in performance-based activities, the number of tasks that are based on performance may be increased in learning environments. This will enhance the quality of learning.

This study's participants were pre-service science teachers. Similar studies should be conducted with different samples or larger numbers of pre-service teachers, and other formative evaluation practices should be tested with different samples.



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