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Attitudes of Mathematics and Science Educators towards Mistake and Instant Feedback

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ABSTRACT
The quality of teaching mathematics and science depends on the teachers' competencies about instant feedback to mistakes. Instant feedback is some kind of feedback used whenever a mistake occurs. Mistakes are a starting point for learning; a chance to construct new knowledge or describe the misconceptions. Therefore studies on mistakes and instant feedback are a necessity. Besides, comparing applications is necessary to improve teachers. Attitudes affect implementations. Therefore, it is necessary to understand teachers' attitudes about them. The purpose of the research is to describe and compare the attitudes of mathematics and science educators towards mistakes and instant feedback. The present study is a relational study with a descriptive pattern aimed to describe the relationship between mathematics educators' and science educators' attitudes. "Attitude Scale of Mathematics and Science Teachers towards Mistake and Instant Feedback (MST-AS)" (Türkdoğan, 2020) implemented to 398 mathematics and science educators teaching at public elementary, secondary schools or universities. Validity and reliability studies were made with SPSS 25.0 package program. Data were analyzed using t-Test and One Way ANOVA tests. There are not statistically differences between mathematics and science educators' attitudes towards giving feedback to the mistakes. Both educators have positive attitudes. Additionally, no statistically significant difference was found by age, gender, professional experience level or education level. Cronbach Alpha coefficient of the scale was found to be .871. In the sub-dimensions, the Cronbach Alpha coefficient of the scale was .861 for external factors. It was found to be .858 for internal factors.

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Introduction

The student-centered math (Türkdoğan, 2011) and science curriculum (Cengiz, Ayvacı, 2017), which has been the most accepted curriculum in recent years, is based on constructivist theory. 5E is perhaps the most widely accepted model of how constructivist theory can be applied in classrooms. This model includes an introduction that will attract the student's attention (engage), then explore, explain, elaborate and evaluate steps related to knowledge, comprehension or a phenomenon (Bybee et al., 2006).

In the engage stage, the teacher surveys the students' prior knowledge of the subject, concept or event. Surely the majority of the answers of the students will be wrong. Otherwise, the activity should be considered as below the student's learning threshold. It is important to know how the teacher behaves in the face of these mistakes (Bybee et al., 2006; Eisenkraft, 2003).

The explore phase requires students to establish hypotheses by conducting research and share them with their friends. At this stage, almost no students should be expected to give correct answers. Otherwise, the activity is still below the learning threshold. The teacher's guidance task is even more prominent in the research phase than in other stages. At this stage, the teacher has to find the shortcomings and mistakes of the students' predictions and resolve them through his or her activities (Wilder, Shuttleworth, 2005).

In the elaborate phase, students try to apply the new knowledge they have learned on a similar task. At this stage, students should not be expected to apply their newly learned knowledge easily (Campbell, 2000). Therefore, the elaborate process can often lead to the formation and emergence of mistakes. A good understanding of the process of the emergence of mistakes, and how the teacher can guide after the mistakes have come out is needed (Bybee, 2002). However, it is known that there is insufficient information on how to deal with mistakes (Watson, 2002). In understanding the causes of this deficiency, it will be useful to examine the perspective of teaching approaches toward mistakes.

The perspective of behaviorist theories on the mistake: Mistake is seen as a phenomenon that must be ignored, suppressed (should be punished when it occurs) and resulting from the inattention of the student, disruptions in the communication path or wrong reaction (Borasi, 1994, 2002; Dalehefte et al., 2012; Heinze, 2005; Melis, 2003, 2005; Santagata, 2002; Santagata, Barbieri, 2005; Tsovaltzi et al., 2009).

The perspective of cognitive theories on the mistake: Cognitive theories heeded the misconception (Dalehefte et al., 2012) and examined its detection, elimination and effects on the learning process. However, as is known, misconceptions are a causal, permanent and persistent cognitive condition that occurs after the completion of a teaching process (Kabapınar, 2003). The literature on misconceptions carried out by scientists who adopt the cognitive approach is sufficiently comprehensive (detection of misconceptions, elimination of misconceptions, etc.) (Baki, 2008). However, the cognitive literature is not sufficient to explain the mistake and the feedback given to the mistake. Because if the mistakes made by the students are repeated while learning, or the student defends the accuracy of the mistake, it is not a misconception. The students' answers, which are not correct, are incorrect until the subject is finished (Mohyuddin, Khalil, 2016). For this reason, the perspective of cognitive approaches to the mistake also fails to adequately contribute to teachers about how to deal with mistakes in a student-centered learning environment.

The perspective of constructivist theory on the mistake: Misconceptions are also important in constructivist theory (Dalehefte et al., 2012). Because one of the most important obstacles in creating an effective learning environment in student-centered education is seen as misconceptions. For learning, it is necessary to determine the prior knowledge of the students, to remind the basic knowledge on which the learning will be structured and to eliminate misconceptions. A false construction will cause the subsequent structures to be wrong, thus causing continuous mistakes to be made in the learning environment. Although it is thought that learning without misconception will contribute positively to later learnings, this is not always true. Students can do mistakes even after an ideal structuring. Mistakes are also useful to building correct knowledge (Dweck, 2016; Gedik, Konyalioglu, 2016). Therefore, one of the most important problems that constructivist models have to deal with is the mistakes (Santagata, 2002, 2005). For this reason, in the constructivist approach, mistakes should be examined as much as misconceptions (Türkdoğan et al., 2009; Türkdoğan, Baki, 2012).

Since the literature on the mistake is mostly focused on detecting and eliminating misconceptions, sufficient strategies for the mistake and combating mistake have not been identified. The teacher's lack of experience and theoretical knowledge about the subject may cause the teacher to be deficient and to fall into a difficult situation in cases where the mistake is to have interfered with the learning process. A sudden mistake could create an effect that increases anxiety and decreases

time control for an untrained teacher. This could also cause teachers to be angry and disrupt student-centered environments where students are intended to freely say their thoughts. Teachers are known to resent students who do mistakes in subjects they think are simple, such as definitions or terms (Heinze, 2005). In fact, there is no reason for the teacher to be angry. Because it should be considered natural to encounter mistakes in the learning environment (Borasi, 1994; Käfer et al., 2019).

There is limited literature on how teachers should react instantly when they encounter a mistake in the learning process (Soncini et al., 2020). The majorities of these studies were carried out by psychologists and investigated the community's perspectives on the mistake and teachers' perspectives on the mistakes in mathematics (Santagata, Stigler, 2000; Santagata, 2000, 2002, 2004, 2005; Matteucci et al., 2015). Perhaps Santagata (2002) conducted the most comprehensive study about mistakes and feedbacks on the mistake, which is also a reference source for other studies. Santagata has classified, defined and sampled the mistakes and feedbacks given to the mistakes. The researchers have done and proposed many studies examining the similarities and differences between cultures by emphasizing that the mistake and feedback given to the mistake is a cultural phenomenon (Sterponi, Santagata, 2000; Santagata, 2002, 2004, 2005). Nevertheless, when a mistake is encountered, factors other than the cultural components that affect the teacher's behavior have not been adequately revealed. The mistake's place and importance in mathematics and the factors affecting the feedback given to the mistake, which is studied by psychologists, must be studied in detail by the mathematicians. Through these studies, teachers' perspectives on the mistake and the ways they interfere with the mistake can be determined.

This study aims to identify effective factors that influence teachers' feedback on the mistake. It is known that strong attitudes are effective in shaping behaviors (Krosnick, Petty, 1995). According to Allsport (1935) "attitude is in business with a mental and neural state of readiness, organized through experience, exerting a directive and dynamic influence upon individual's response to all objects and situations with which it is related" (as cited in Malim, Birch, 1998). Attitude is also defined as to like or not (Bem, 1970). According to Bloom (1976), the attitude is to have positive thoughts about a lesson or subject, to love or show positive affective characteristics about a lesson, or to have negative thoughts about a lesson and subject, to dislike show negative affective characteristics about a lesson. Attitude is a phenomenon gained through learning that guides individual behavior and can lead to bias in the decision-making process (Ülgen, 1997). Attitude is the tendency to react positively or negatively that is learned towards certain objects, situations, institutions, concepts, or other people (Tezbaşaran, 1997). Although attitude plays an important role in people's success, it is very difficult to create an attitude towards a certain object or to change the existing attitude. To change the attitudes, first, the characteristics of the target audience, the factors that lead to the formation and development of the attitudes, and current attitudes must be revealed (Erden, 1995).

Therefore, teachers' attitudes of mistakes and giving feedback should be examined (Matteucci et al., 2015) and compared. Perhaps the most appropriate field for comparing mathematics teachers' attitudes on any subject is science. Science lessons presents knowledge and skills from a number of disciplines together (Yaşar, Anagün, 2009). Perhaps the most intense of these branches is mathematics. Ofcourse mistakes are as useful as they are inevitable in a student-centered educational environment (Türkdoğan et al., 2009). Therefore, it is necessary to examine how the teachers use instant feedbacks and to examine the factors that affect the instant feedbacks given to the mistakes. This study is the first study that examines and compares science and mathematics educators' attitudes towards mistake and instant feedbacks.

Purpose and Problem Statement

The researchers carried out some studies about types of mistakes and techniques used by teachers to give instant feedback to mistakes (Türkdoğan, 2011; Türkdoğan et al., 2009; Türkdoğan, Baki, 2012). Therefore, one of the researchers of this study developed a scale that measures teachers' perception of mistakes and giving feedback (Türkdoğan, 2020). With the scale, it is possible to

determine what kind of dimensions affect the selection of the methods used to give feedback to the mistake. The aim of this study is to determine and compare attitudes of mathematics and science educators towards mistakes and instant feedbacks, in light of demographic features. The sub-problems of the study are determined as follows:
1- What is the relationship between gender and attitude?
2- What is the relationship between branch and attitude?
3- What is the relationship between experience and attitude?
4- What is the relationship between education level and attitude?

Methods

Design of the Study

This research was conducted with quantitative research methods. The research has been designed with a non-experimental survey model. Quantitative research is an approach to testing objective hypotheses by examining the relationship between variables. These variables can usually be measured sequentially with measurement tools, so that digitized data can be analyzed using statistical processes (Creswell, 2013: 4).

Sample

Science and mathematic educators constitute the universe of this study. Convenient sampling made in the study. Researchers tried to reach the whole population. But only 398 people attended to study. Demographic information about the sample is presented in Table 1.

Table 1

Demographic Information about the Sample

Variable	N	%	Variable	N	%
Gender			Experience		
Female	267	67	0-5 years	155	39
Male	131	33	6-10 years	118	30
Branch			11-15 years	62	16
Science	214	54	16 years or more	63	16
Maths	184	46	Degree of education	N	%
Age	N	%	Bachelor's	258	65
21-30	199	50	Master's	90	23
31-40	147	37	PhD	50	13
41-50	45	11			
51 or more	7	2			

The sample of the study consists of 398 mathematics and science teachers and academicians teaching at public elementary and secondary schools and universities. The sample including 131 male and 267 female; 214 science educators, 184 mathematic educators; 199 of them were at the age of 21-30, 147 of them at the age of 31-40, 45 of them at the age of 41-50, 7 of them at the age of 51 or more, 155 of them at the 0-5 year professional experience year, 118 of them at the 6-10 year professional experience year, 62 of them at the 11-15 year professional experience year, 63 of them at the 16 or more years of professional experience, 258 of them trained at the undergraduate level, 90 of them trained at the master's level education, 90 of them trained at the doctoral level education

Data Collection Tool

The descriptive analysis enables a numerical description of the situation on a sample selected in a universe. And it is assumed that the tendencies and attitudes across the universe can be determined using the data obtained (Cresweell, 2013). The scale used in this study consists of two parts. In the first part, sampling, demographic characteristics were asked. The asked demographic information is in the form of gender, branch, age, experience, and education level.

In the second part, to describe the relationship between mathematics and science educators' attitudes towards mistake and instant feedback, a scale was used as the data collection tool. The scale was developed by Türkdoğan (2020) is MST-AS.

MST-AS is a 5-point Likert type scale consisting of 14 items. The scale shows a structure with two factors (internal causes-external causes). Each factor consists of 7 items. In this study, scale grading was done as follows: "I absolutely disagree: 1", "I disagree: 2", "I am indecisive: 3", "I agree: 4" and "I absolutely agree: 5". On the scale, there were 7 negative sentences. The Cronbach Alpha coefficient was found to be .829 in the original scale, which was prepared with the sample of 420 teacher and teacher candidates. The Cronbach Alpha reliability coefficient for the whole scale and the subscales and the correlation coefficients between the subscales show that the MST-AS is reliable (Türkdoğan, 2020). KMO value was calculated as .808. Besides, as a result of *Bartlett's test* for *Sphericity*, the chi-square value was determined to be significant (X^2=1574.81; p<.01) (Türkdoğan, 2020).

Data Collection

The data of the research were collected with the help of social media between November and December 2020. During the data collection phase, the sample was informed about the purpose, scope and process of the research by the researchers, with the consent written at the beginning of the questionnaire. The attitude scale was applied through Google Forms.

The scale was transformed into an online form and the link of the form was shared over the WhatsApp groups and social media accounts of the researchers' colleagues. In the posts, people were asked to fill out the forms, share the link from their social media accounts, and send them to graduate and doctoral students. The data obtained from the application was arranged in the 25.0 version of the SPSS package program.

Analysis of the Data

The data obtained from the scale was analyzed in the 25.0 version of the SPSS package program. In the analysis, frequency and percentage distributions, independent variable t-test and one-way analysis of variances (ANOVA) were used. The answers of the negative sentences in the MST-AS were re-coded in the opposite direction from "I absolutely agree: 1" to "I absolutely disagree: 5", "I agree: 2" to "I disagree: 4".

The distribution of the scores from the scale was examined coefficient of skewness and kurtosis coefficient were calculate to be -,316 and -,394, respectively. These statistical data indicated that the scores were normally distributed (Brownlow, 2004; Tabachnick, Fidell, 2013).

Findings

Under this heading, the findings of the study are explained in the form of tables. The attitudes of science and mathematics educators have been examined in terms of various demographic variables. This study is the first study in which the attitudes of the two groups towards mistakes and immediate feedback are compared. In the study, the attitudes of science and mathematics educators towards

mistake and instant feedback were determined by considering the sub-dimensions. And the results are discussed in light of the literature.

Descriptive Findings

As a result of the analysis of the data, the total attitude average of the sample is 60.35 (N = 398). Considering that the highest score that can be obtained from the MST-AS (14x5 = 70) is 70, it is seen that the average is high, that is, the attitude of teachers and academicians to feedback is high. It is seen that the average score per item (60.35 / 14 = 4.31) is above 4.

The external dimension of the attitude' average is 28.29 (N = 398). Considering that the highest score that can be obtained from the external dimension (7x5 =35) is 35, it is seen that the average is high, that is, the attitude of teachers and academicians to feedback is high. It is seen that the average score per item (28.29/7=4.04) is above 4.

The internal dimension of the attitude' average is 32.06 (N = 398). Considering that the highest score that can be obtained from the internal dimension (7x5 =35) is 35, it is seen that the average is high, that is, the attitude of teachers and academicians to feedback is high. It is seen that the average score per item (32.06 /7=4.58) is above 4.

Findings Regarding the Reliability of the Scale

Cronbach Alpha reliability coefficient was calculated as .871 for the new implementation of MST-AS. The Cronbach Alpha reliability coefficient was calculated as .861 for the external causes dimension, for the internal causes dimension as .858. These results are proof that sub-scales of the MST-AS are reliable (Brownlow, 2004).

KMO value was=.903>.90. And the value is superb for sample size (Brownlow, 2004; Hutcheson, Sofroniou, 1999; Pett et al., 2003). Furthermore, when the results of *Bartlett's test* for *Sphericity* were examined, it was determined that the chi-square value was significant (X^2=2392.92; p<.01). It has been accepted that data can be factored into these results (Child, 2006; Hutcheson, Sofroniou, 1999; Pett et al., 2003).

Findings on the Relationship between Gender and Attitude

The results of the t-Test for the relationship between the gender and attitudes of the people in the sample and the results of the t-Test for gender and sub-attitude dimensions are given in Table 2.

Table 2

t-Test Results on the Relationship between the Gender and Attitudes of the Sample

	Gender	N		Ss	t	p
External attitude dimension	Female	267	32,21	3,044	1.385	.092
	Male	131	31.76	3.133		
Internal attitude dimension	Female	267	28.39	4.407	.583	.628
	Male	131	28.11	4.650		
Total attitude	Female	267	60.60	6.220	1.075	.376
	Male	131	59.86	6.734		

Note. p<.01

When the table is examined, it is seen that there is no statistically significant difference between the gender of the sample and the external attitude dimension (t_{398}= 1.385, p =.092> .01). However, the average of females is higher.

When the table is examined, it is seen that there is no statistically significant difference between the gender of the sample and the internal attitude dimension (t_{398}= .583, p=.628>.01). However, the average of females is higher.

When the table is examined, it is seen that there is no statistically significant difference between the gender of the sample and the total attitude (t_{398}= 1.075, p= .376>.01). However, the average of females is higher.

Findings on the Relationship between Branch and Attitude

The results of the t-Test for the relationship between the branch and attitudes of the people in the sample and the results of the t-Test for branch and sub-attitude dimensions are given in Table 3.

Table 3

t-Test Results on the Relationship between the Branch and Attitudes of the Sample

	Branch	N	$\bar{x}$	Ss	t	P
External attitude dimension	Science	214	31.82	3.171	-1.700	.035
	Maths	184	32.34	2.947		
Internal attitude dimension	Science	214	28.21	4.357	-.379	.386
	Maths	184	28.39	4.637		
Total attitude	Science	214	60.03	6.186	-1.082	.382
	Maths	184	60.73	6.627		

Note. p<.01

When the table is examined, it is seen that there is no statistically significant difference between the branch of the sample and the external attitude dimension (t_{398}=-1.700, p=.035 >.01). However, the average of mathematicians' is higher.

When the table is examined, it is seen that there is no statistically significant difference between the branch of the sample and the internal attitude dimension (t_{398}=-.379, p=.386>.01). However, the average of mathematicians' is higher.

When the table is examined, it is seen that there is no statistically significant difference between the branch of the sample and the total attitude (t_{398}=-1.082, p=.328>.01). However, the average of mathematicians' is higher.

Findings on the Relationship between Age and Attitude

The results of the One-Way ANOVA for the relationship between the age and attitudes of the people in the sample and the results of the One-Way ANOVA for age and sub-attitude dimensions are given in Table 4.

Table 4

The One-Way ANOVA Results on the Relationship between the Age and Attitudes of the Sample

	Age range	N	$\bar{x}$	Ss	F	p
External attitude dimension	21-30	199	32.27	3.107	2.799	.040
	31-40	147	32.17	2.853		
	41-50	45	31.09	3.417		
	51 or more	7	30.14	3.338		
Internal attitude dimension	21-30	199	28.48	4.253	2.508	.059

	31-40	147	28.07	4.842		
	41-50	45	28.87	3.776		
	51 or more	7	24.14	5.786		
Total attitude	21-30	199	60.74	6.166	2.448	.063
	31-40	147	60.24	6.525		
	41-50	45	59.96	6.299		
	51 or more	7	54.29	8.635		

Note. p<.01

When the table is examined, it is seen that there is no statistically significant difference between the age of the sample and the external attitude dimension (F_{398}=2.799, p>.01). However, the highest average belongs to the age range of 21-30, while the lowest average belongs to the age range 51 years and above.

When the table is examined, it is seen that there is no statistically significant difference between the age of the sample and the internal attitude dimension (F_{398}=2.508, p>.01). However, the highest average belongs to the age range of 41-50, while the lowest average belongs to the age range 51 years and above.

When the table is examined, it is seen that there is no statistically significant difference between the age of the sample and the total attitude (F_{398}=2.448, p>.01). However, the highest average belongs to the age range of 21-30, while the lowest average belongs to the age range 51 years and above.

Findings on the Relationship between Experience and Attitude

The results of the One-Way ANOVA for the relationship between the experience and attitudes of the people in the sample and the results of the One-Way ANOVA for experience and sub-attitude dimensions are given in Table 5.

Table 5

The One-Way ANOVA Results on the Relationship between the Experience and Attitudes of the Sample

	Experience	N	$\bar{x}$	Ss	F	p
External attitude dimension	0-5 years	155	32.23	3.120	2.720	.044
	6-10 years	118	32.19	2.924		
	11-15 years	62	32.40	2.682		
	16 years and over	63	31.06	3.464		
Internal attitude dimension	0-5 years	155	28.47	3.992	.898	.442
	6-10 years	118	28.59	4.628		
	11-15 years	62	27.55	5.527		
	16 years and over	63	28.03	4.220		
Total attitude	0-5 years	155	60.70	5.761	1.227	.299
	6-10 years	118	60.79	6.607		
	11-15 years	62	59.95	6.967		
	16 years and over	63	59.10	6.846		

Note. p<.01

When the table is examined, it is seen that there is no statistically significant difference between the experience of the sample and the external attitude dimension (F_{398}=2.720, p>.01).

However, the highest average belongs to the experience range of 0-5, while the lowest average belongs to the experience range 16 years and above.

When the table is examined, it is seen that there is no statistically significant difference between the experience of the sample and the internal attitude dimension (F_{398}= .898, p=.442>.01). However, the highest average belongs to the experience range of 6-10, while the lowest average belongs to the experience range 11-15.

When the table is examined, it is seen that there is no statistically significant difference between the experience of the sample and the total attitude (F_{398}=1.227, p=.299>.01). However, the highest average belongs to the experience range of 0-5, while the lowest average belongs to the experience range 16 years and above.

Findings on the relationship between education level and attitude

The results of the One-Way ANOVA for the relationship between the education level and attitudes of the people in the sample and the results of the One-Way ANOVA for education level and sub-attitude dimensions are given in Table 6.

Table 6

The One-Way ANOVA Results on the Relationship between the Education Level and Attitudes of the Sample

	Education level	N	$\bar{x}$	Ss	F	p
External attitude dimension	Bachelor's	258	31.97	3.249	2.217	.110
	Master's	90	32.60	2.485		
	Doctorate	50	31.54	3.045		
Internal attitude dimension	Bachelor's	258	28.18	4.379	.752	.472
	Master's	90	28.22	4.780		
	Doctorate	50	29.02	4.497		
Total attitude	Bachelor's	258	60.15	6.401	.396	.673
	Master's	90	60.82	6.277		
	Doctorate	50	60.56	6.646		

Note. p<.01

When the table is examined, it is seen that there is no statistically significant difference between the education level of the sample and the external attitude dimension (F_{398}=2.217, p=.110>.01). However, the highest average belongs to the education level of Master's, while the lowest average belongs to the education level of doctorate.

When the table is examined, it is seen that there is no statistically significant difference between the education level of the sample and the internal attitude dimension (F_{398}= .752, p=.472>.01). However, the highest average belongs to the education level of doctorate, while the lowest average belongs to the education level of Bachelor's.

When the table is examined, it is seen that there is no statistically significant difference between the education level of the sample and the total attitude (F_{398}= .396, p=.673>.01). However, the highest average belongs to the education level of Master's, while the lowest average belongs to the education level of Bachelor's.

Conclusions and Recommendations

Attitude, behavior, and perception affect one another as a cycle. Behaviors are affected by attitudes. Therefore, determining and increasing the attitude to mistake and instant feedback may positively affect teachers' feedback habits too (behaviors). The more positive feedback from teachers will provide more positive feedback from students to teachers, too. Mistake and instant feedback

perception of teachers who receive positive feedback from students may also be more positive. This positive perception can affect the attitude even more positively. As a result, the better this cycle can be operated, the more positive the mistake and instant feedback behavior can change. The change in instant feedback that teachers give to mistakes affects student success (Heinze, Reis, 2007). For this reason, the concept of instant feedback to mistake should be studied by considering the dimensions of "perception-attitude-behavior".

The MST-AS is a valid and reliable scale that can be used in experimental and descriptive research to determine the attitudes of math and science teachers and academicians towards mistakes and instant feedback to mistake.

There is no statistically significant difference between the attitudes of giving instant feedback to mistakes depending on gender. Females' attitude averages are higher. It is known that female science teachers give more positive feedback and try harder than male science teachers (Özkale, 2018). And it is known that female teachers are better at communicating with students (Bedur, 2007). Therefore, when a mistake appears how teachers give instant feedback differs should search according to gender.

There is no statistically significant difference between the attitudes of giving instant feedback to mistakes depending on the branch. This is the only study which explores the difference of attidudies of two branches. Further studies could conduct, for to understand the situation more clearly. There is no statistically significant difference between the attitudes of giving instant feedback to mistakes depending on experience. No significant difference was found between the communications of classroom teachers with students according to their years of experience (Bedur, 2007). The change of math and science educators' communication ability in the light of mistake and instant feedback should be investigated according to experience. Mistake perspectives of teachers are negative (Gedik-Altun, Konyalioglu, 2019). Haydar et al. (2009) stated that feedback techniques differ from teacher to teacher. Especially, teachers with insufficient content knowledge give more negative feedback to students. It is also stated that teachers with insufficient content knowledge makes fewer interview and frequently, tend to say the answer directly. Besides, the researchers examined the feedback habits of teachers in the first year of their profession and they found that the feedback perceptions of teachers changed rapidly. Although there is no statistically significant difference between professional experience and attitude in this study, the change of attitudes can be analyzed with a study involving teacher candidates and teachers in the first 5 years of their teaching. Or the change in attitudes can be examined by examining the same group with a longitudinal study.

There is no statistically significant difference between the attitudes of giving instant feedback to mistakes depending on education level. Santagata (2005) states that different reactions are given to mistake in different social environments. In this sense, the study states that mistake and instant feedbacks can differ in different countries. Italian teachers spend an average of 5.2 minutes of a lesson giving feedback to mistakes, while American teachers spend 3.86 minutes. The French responding by shouting at students who made mistakes; Japanese teachers to prepare lessons by making mistakes into account. And it is accepted as proof that the mistake is interpreted in different ways in different social environments. In the study of Santagata (2002), it was found that American teachers gave 1% trust-breaking feedback, while Italian teachers gave 35% trust-breaking feedback. American teachers stated that if the student makes a mistake, they asked the question to another student in order not to break the student's trust. Therefore, the study should be repeated to understand the situation in different cultures/countries.

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