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Using correction codes to enhance understanding of 4-parts harmony

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The effective ways of error correction in teaching musical harmony have been neglected. Making students realize their mistakes and have them think over them are assumed to be helpful in harmony teaching. In this sense, correction code technique is thought to be beneficial for students to realize their mistakes and solve them on their own. Forty eight volunteer participants took a harmonization test and the experimental group received written corrective feedback via correction codes whereas the control group was corrected traditionally. This study was conducted to evaluate the efficacy of correction code technique on enhancing their understanding of 4-parts harmony. The results showed that experimental group improved more than control group between pre-test and post-test, $F(1, 46) = 4.719$, $p < 0.035$, $\omega 2 = 0.051$. Finally, students were asked open-ended questions allowing them express their feelings and reflect on the process. The data acquired from qualitative and quantitative parts of the study suggested that correction code technique was an effective way of error correction in 4-parts harmony.

Key words: Correction codes, error correction, 4-parts harmony, music education, written feedback.

INTRODUCTION

Written error correction is the most common way of responding to students' mistakes on their exam papers. Although there is not enough research to prove traditional way, directly correcting the errors, does not promote meaningful improvement on students' understanding of their mistakes, it is believed that more beneficial technique is needed in order for students to give chance to think over their weaknesses and not to repeat the same mistakes over and over again. When students are shown their exam papers, most of the time they only focus on the grade they get ignoring the mistakes they make. To avoid this and to let them realize the points they do not, correction codes are used.

The correction code technique is basically a type of indirect written corrective feedback. The exam papers of the students are corrected by using pre-determined codes or abbreviations and are not corrected directly. When students get to see their exam papers, they see the codes and try to understand the mistakes they did. Therefore, the students have the opportunity to think over their mistakes and try to correct them on their own. This technique is commonly used in English language

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teaching. It is believed that this technique will be beneficial for the music education students as they also need to get feedback in harmony courses.

In the scope of the Turkish education system, harmony education takes place in the programs of institutions that train music teachers, sometimes under the name of music theories, sometimes with different names (Sağlam, 1988). In education faculties, harmony education was taught within the course of Music Theory and Hearing Education, which was included in the program applied by the Higher Education Institution between years 1998 and 2006. Since 2006, it has been taught under the name of Harmony-Counterpoint-Accompaniment, which lasts four semesters. Harmony education which is one of the main courses in music education programs aims at educating musicians and composers as well as music educators, is one of the most challenging lessons for students. In a study by Eroğlu (2015) in-service music teachers' opinions on harmony education were collected and the results showed that most of the music teachers believe the importance of harmony knowledge and skills in order to be a proficient music teacher, but unfortunately, they believed their harmony knowledge and skills are not high enough to fulfil the requirements of music teaching profession.

Considering that harmony education is one of the basic lessons of music teacher education program, it can be said that the achievement in this course can affect the other courses. In this respect, different techniques should be tried out in order to enhance students' success and understanding of the subject matter. That is why this study has a crucial role to help students overcome the difficulties that they have in understanding 4-part harmony. Moreover, the use of correction code technique has not been investigated in music education. Whilst some research has been carried out on the efficacy of correction code technique in English language teaching, no single study exits in music education. As this study is the first of its kind, which tries out the efficacy of the correction code technique on harmony education, it will contribute to the field of music education by elaborating different techniques to enhance students' success and understanding.

Theoretical framework

Assessment has played a vital role in education, which is divided into two distinct categories, namely summative and formative assessments. Scriven (1967) is one of the first researchers who made a distinction between summative and formative assessment. He defines summative assessment as a process, which makes a judgment according to criteria and standards, while formative assessment is an on-going process of improvement. Furthermore, formative assessment is used to assess students to what extend they learn a specific topic and to identify their misunderstandings and mistakes about the topic being taught. In the learning process, as Kordes et al. (2014) mentioned that students come across challenges and develop a desire to explore, discover and make further progress. Therefore, students should become more aware of the importance of following their own progress and seeking optimum ways for their own development.

In this viewpoint, having students take short and frequent tests in order to observe their improvement through the process of learning can be considered as a key element in education. However, the question of how the students should be given feedback during these assessments remains unsolved (Lee, 1997).

Finding the appropriate way of giving feedback has always been a challenge for teachers (Ferris and Roberts, 2001). Written corrective feedback has been categorized as direct corrective feedback and indirect corrective feedback (Ferris, 1995; Hendrikson, 1980; Lee, 2004). The term direct correction is self-explanatory, referring to a direct correction of students' mistakes in their written productions while making the teacher a sole source of the correct information. On the other hand, indirect correction refers to prompting students about the location of their errors (Hyland, 1990) and helping them grow as autonomous learners.

Correction code technique, a form of indirect corrective feedback, means pointing the mistakes of students on their written work and by using the predetermined codes helping them realize what kind of mistake they have done (Oshima and Hogue, 1997). Having students think over their mistakes consciously might be one of the most important features of the technique, as Schmidt (1990) states in his article about noticing hypothesis that learners can only learn by the help of consciously noticing which helps converting input to intake. Moreover, he added that the task given to the learners must help them focus on what is to be learned; only then the target knowledge can be acquired by the learner.

The comparison of language and music has always been on the agenda owing to the role of music and language in human life and also because they both contain complex and meaningful structures. Furthermore, they both have important common points in the creation and learning process (Göktepe, 2013). In this sense, harmony in music is similar to grammar in language in several ways. A grammar of a language is a set of abstract devices, rule systems, and principles, which are used to form an acceptable sentence, which means grammar generates the language (Chierchia and McConnell-Ginet, 2000). Harmony is the musical result of tones sounding together. Whereas melody implies the linear or horizontal aspect of music, harmony refers to the vertical dimension of music (Benward and Saker, 2009). According to Chatham (2007) music have a form of implicit rule structure like grammar in language. However, as Sutcliffe (2014) states, in both grammar and harmony,

rules do not restrict possibilities, on the contrary, they increase them. As the syntax in language enables us to generate an infinite number of sentences from a finite number of words, it is possible to generate infinite number of melodies, harmonic structures, styles and varieties of music by using a few notes of a musical scale. The grammar of a language is made up with many components, like the grammar of tonal music which are the structure of chords, the rules for voice leading (part writing), the syntax of chord progressions (Sutcliffe, 2014). Therefore, correction code technique, which has proved its efficacy on written productions of learners in language learning can and should be applied to harmony teaching as this course also has quite similar expectations from learners.

Purpose of the study

The purpose of this study is to determine the efficacy of the correction code technique to enhance understanding of 4-parts harmony in Music Teacher Education program.

It is hypothesized that correction code technique will help students to think deeply about their mistakes and gain understanding by growing as an automatous learner. Therefore, they will not repeat the same mistakes by realizing their weaknesses and they will benefit more as compared to the traditional direct error correction.

This study sets out to seek answers to the following questions:

1. To what extend does correction code technique help students overcome their mistakes on written harmony exams?
2. What do the students think about the efficacy of correction code technique?

METHODOLOGY

Setting and participants

This study was conducted with convenience sampling consisting of sophomores who were registered to harmony course in spring term in 2016/2017 academic year at a state university. The curriculum of the music education program offers 2 hour harmony course both in fall and spring term in the freshmen and sophomore years. There were 2 sophomore classes, which received harmony course from the researcher himself who has PhD in music education and has been giving courses on harmony education for several years. One of the classes was assigned as experimental group, whereas the other class was assigned as control group randomly and the design of the study was determined as the static-group pretest-posttest design. In each group, there were 24 (totally 48) students who voluntarily attended to the study.

Data collection instruments and procedure

This study contains both qualitative and quantitative data. Prior to the data collection, the participants in the experimental group receive a detailed explanation of the technique. The key of the correction codes is explained and handed out (Appendix A). As a first step, all the students in both control and experimental groups take a harmonization test. In the preparation process of the test, a melody harmonization including the subjects taught during the term was composed. In this four-part harmonization, some of the chord symbols and notes are deleted in order to create a test. In order to determine whether the test is valid instrument to measure the level of harmony knowledge, three academicians who lecture on music theory were consulted. According to their feedback, necessary adjustments were made. For scoring each chord and symbol written correctly was given 1 point. The students are asked to fill the notes and figured bass symbols, which are left blank in a given four part harmonization (Appendix B). The mistakes on the students' exam papers in experimental group are coded according to the correction code list, which is given to the students beforehand whereas the students' exam papers in control group are corrected directly by the instructor. One week later, the students in experimental group attend a follow-up session in which they are given their coded tests and asked to correct their mistakes on their own. This session gives them chance to think over their mistakes and raise an awareness of their weaknesses. The control group, on the other hand, has only seen the exam papers which are corrected directly by the instructor. Two weeks later, both groups receive their post-tests. The post-test includes very similar questions to the pre-test. Post-test differs from pre-test only in tonality. Pre-test is in Bb Major whereas post-test is in A Major. The Cronbach alpha values of both pre-test and post-test were calculated as 0.86.

The final stage of the study comprises a structured interview with participants who are asked open-ended questions allowing them express their feelings and reflect on the process (Appendix C).

Data analysis

The quantitative data were analysed using a 2 × 2 ANOVA in which the test variable is within group factor with two levels (pre-test and post-test) and group variable is between groups factor with two levels (experimental group and control group). The qualitative data was transcripted and grouped in order to report in the result section.

RESULTS

The results of the quantitative data

Descriptive statistics of the results of pre-test and post-test are shown subsequently. As shown in Table 1, both groups' scores improved between pre-test and post-test. Improvement in experimental group was higher. To test if this difference was significant, a two-way ANOVA was employed. Levene's test showed that the assumption of equal variances was met for pre-test, F (1, 46) = 0.013, p = 0.909, and for post-test, F (1, 46) = 2.077, p = 0.156.

Two-way ANOVA results are shown subsequently. As shown in Table 2, the main effect of the group was not significant, F (1, 46) = 0.120, p = 0.731, ω^2 = 0.000. There was a significant main effect of test, F (1, 46) = 20.965, p < 0.001, ω^2 = 0.275. There was a significant interaction between test and group F (1, 46) = 4.719, p < 0.035, ω^2 = 0.051.

These results showed that both experimental and control groups improved but experimental group improved more. In other words, both traditional and

Table 1. Descriptive statistics of the pre-test and post-test.

Test	Group	Mean	SD	N
Pre-Test	Experimental	11.58	5.397	24
	Control	13.42	5.174	24
Post-Test	Experimental	15.79	5.868	24
	Control	14.92	4.520	24

Table 2. Main and interaction effects of the variables Test and Group.

Source of variance	*SS*	*df*	*MS*	*F*	*p*	ω^2
Group	5.510	1	5.510	0.120	0.731	0.000
Residual	2118.479	46	46.054	-	-	-
Test	195.51	1	195.510	20.965	<0.001	0.275
Test * Group	44.01	1	44.010	4.719	0.035	0.051
Residual	428.98	46	9.326	-	-	-

coding method worked but coding method was more useful.

Results of the qualitative data

On the day when the interview was carried out, 17 of the 24 participants were available in class.

For the qualitative part of the study, participants were asked to express their feelings and reflect on the process. As shown in Table 3, their responses revealed that only one student out of 17 thinks there is no difference between coded correction and direct traditional correction. The participant reported that

"I believe both of them are equally beneficial"(interviewee 8).

Sixteen participants on the other hand found the activity beneficial.

'This technique helps me realize my mistakes. That's why I find it beneficial. However, understanding the content of the codes seems to me a little bit complicated. It reminds me of my high school days when we use crosscheck in maths' (interviewee 1). *'I find this technique very beneficial. If I hadn't found the mistakes on the test by myself, I wouldn't have realized them and probably kept doing the same mistakes. When I try to figure out my own mistakes, I was enlightened'* (interviewee 2). *'I was able to find my mistakes easily. I was shocked when I saw the mistakes that I had made (b, #)'* (interviewee 4, 10, 15 and 17).

One participant thinks the activity made him realize which subject he could not totally internalize by saying:

'I find it beneficial as I got to see my mistakes one by one in detailed. I realized my weaknesses, and this activity told me what I did not understand and what I should study more' (interviewee 9). *'I think this activity was very useful as we can see our mistakes and try to figure them out and corrected them so it got me thinking that probably I kept doing the same mistakes without realising them for years'* (interviewee 12).

Two participants out of 17 mention that this activity provide permanent learning by saying:

'When I saw my mistakes and try to understand what I had done, I guess I learn permanently. There is no doubt that this technique is beneficial' (interviewee 7) and *'I think that this technique is well-constructed and beneficial. The subjects that are taught in class will be more permanent for us if we keep on using these codes'* (interviewee 5). *'The definitions and instructions of the codes are very clear, so I could understand them easily. As I found my own mistakes, the activity was very enlightening'* (interviewee 14).

Three of them believed that this activity should be repeated more than once as it is helpful by saying:

'I believe this technique should be used repeatedly, one time shot is not enough. I realize my own mistakes' (interviewee 3) and *'It was helpful. I wish we had done it more'* (interviewee 6).

One of them complained that *'Most of the time, we are not allowed to see our exam papers and when we do not*

Table 3. Transcripted responses of participants in experimental group.

Interviewee	Responses
1	'This technique helps me realize my mistakes. That's why I find it beneficial. However, understanding the content of the codes seems to me a little bit complicated. It reminds me of my high school days when we use crosscheck in maths.'
2	'I find this technique very beneficial. If I hadn't found the mistakes on the test by myself, I wouldn't have realized them and probably kept doing the same mistakes. When I try to figure out my own mistakes, I was enlightened.'
3	'I believe this technique should be used repeatedly, one time shot is not enough. I realize my own mistakes.'
4	'I was able to find my mistakes easily. I was shocked when I saw the mistakes that I had made (b, #)'
5	'I think that this technique is well-constructed and beneficial. The subjects that are taught in class will be more permanent for us if we keep on using these codes.'
6	'It was helpful. I wish we had done it more.'
7	'When I saw my mistakes and try to understand what I had done, I guess I learn permanently. There is no doubt that this technique is beneficial.'
8	'I believe both of them are equally beneficial.'
9	'I find it beneficial as I got to see my mistakes one by one in detailed. I realized my weaknesses, and this activity told me what I did not understand and what I should study more.'
10	I believe the technique is really helpful but as this is the first time I think I might not fully understand the process but next time I will benefit more.
11	'Most of the time, we are not allowed to see our exam papers and when we do not get the grade we have expected, we feel disappointed. With this activity, we had the chance to see our mistakes so it is so helpful.'
12	'I think this activity was very useful as we can see our mistakes and try to figure them out and corrected them so it got me thinking that probably I kept doing the same mistakes without realising them for years.'
13	There is not much to say, I think I enjoy the whole process.
14	'The definitions and instructions of the codes are very clear, so I could understand them easily. As I found my own mistakes, the activity was very enlightening.'
15	I really like it. I hope we will have more like this one in other courses, too.
16	'I think that the activity is applicable and it is a creative idea as it allows us to find the mistakes but I guess it would be more efficient if we know the grading of the exam.'
17	I didn't know that I made such a lot of mistakes in very easy parts. I was shocked when I saw my mistakes. There is no doubt that this activity helped me.

get the grade we have expected, we feel disappointed. With this activity, we had the chance to see our mistakes so it is so helpful' (interviewee 11).

Moreover, one participant made a constructive criticism by saying:

'I think that the activity is applicable and it is a creative idea as it allows us to find the mistakes but I guess it would be more efficient if we knew the grading of the

exam' (interviewee 17).

DISCUSSION

This study sets out to determine the efficacy of correction code technique to enhance students' academic success and understanding of the subject matter. The quantitative data reveals a positive improvement on the success of the students in experimental group when pre-test and post-test are compared. It has been observed that students have developed a deeper understanding towards the structures and functions of chords, principles of connection of chords, and the usage of chord symbols. Moreover, the qualitative data, which consist of the responses of students towards the interview questions, have proven that students are satisfied with the whole process. The students report that they demand to participate in this kind of activities more often since they appreciate the activity and seem to realise its efficacy. Most of the students respond positively as the transcribed data in the result part suggests.

As hypothesized in the beginning of the study, correction code technique has been able to help students to think deeply about their mistakes and gained understanding by growing as an automatous learner. This might be due to the fact that the biggest challenge that students have to face during their education is to spot their mistakes and realize their weaknesses. This activity has given them chance to see their mistakes and try to sort them out by themselves. Therefore, they have gained confidence and their motivation has risen as they feel the achievement.

Taken together, these results suggest that correction code technique is a promising and beneficial way of helping students realize their weak points in the subject matter and give them chance to improve them. This research will serve as a base for future studies as it is the very first study to evaluate the efficacy of coding technique on 4-parts harmony course.

IMPLICATIONS AND SUGGESTIONS

The findings of this study have a number of practical implications. Firstly, as the results suggest the coded correction can help students not only see their mistakes but also realize what they really do not understand. Therefore, using this technique for other courses in the music education programs such as ear training, counterpoint or music forms will be worth trying out. Secondly, this technique has increased students motivation since the students realize their weaknesses and have chance to work on them. The students enjoy the process and become more attentive to the class, as it is observed during the process. In this sense, this would be a fruitful area for further work. This research has thrown up many questions in need for further investigation with larger groups. Further studies might explore the long-term effects of the technique with multiple assessments.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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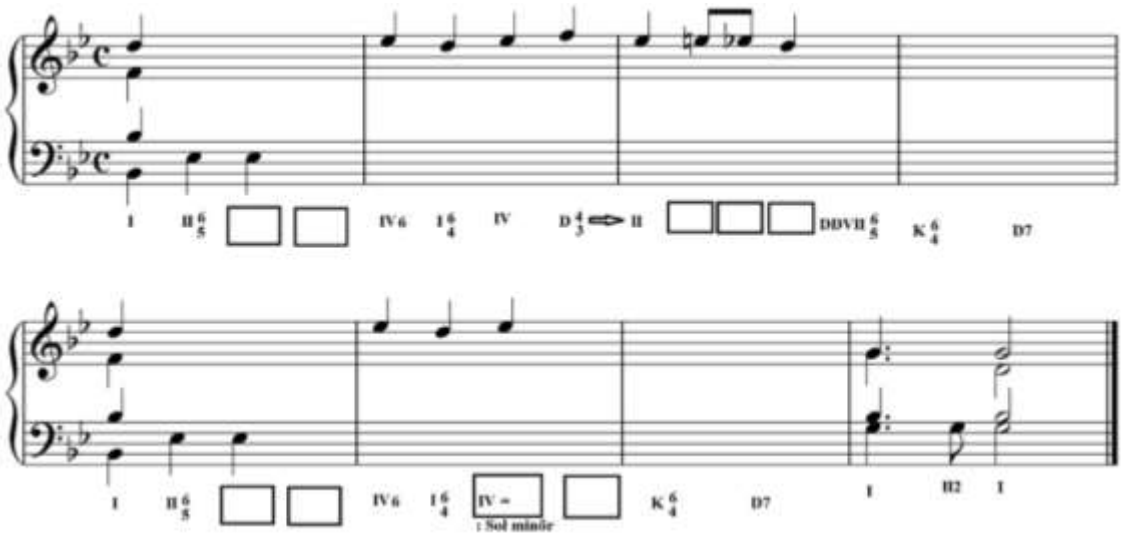
APPENDICES

Appendix A. The key of correction codes.

Correction codes and their definitions	
N	**Note errors**
N_1	Inaccurate or missing notes (including accidentals), inaccurate note choice to duplicate
N_2	Intervals above 8^{th} between S-A or A-T, higher voice in a lower part (e.g. Tenor sings higher than alto)
N_3	Inaccurate inversion of the chord
F	**Functional errors**
F_1	Inaccurate chord progression (e.g. a V chord followed by a IV chord or a II chord followed by a IV chord)
F_2	Proceeding of a function from an upbeat to downbeat
F_3	Inaccurate Function (e.g. a 46 chord which is neither passing nor neighbouring nor cadential)
C	**Connection errors**
C_1	Inaccurate melodic movement (such as 7th or augmented 4th) in any voice part
C_2	Consecutives or hidden consecutives
C_3	Unable to determine the common tone of two consecutive chords. A chord in open position followed by a chord in close position
C_4	Failure to determine common progressions such as I-D46-I6 or DD7-D34-I
C_5	Failure in resolution of chords such as D7 or VII7
S	**Symbol errors**
S_1	Inaccurate symbols for altered notes
S_2	Inaccurate Roman numbers
S_3	Inaccurate symbol for chord inversion

Appendix B. Pre-test.

Name and Surname:
Number:
Class:
Fill in the blanks with appropriate chords and bass symbols.
Use the appropriate secondary dominant chord indicated by the arrow sign.
On the beat where modulation begins (as indicated by =) equal the 4th degree of Bb major as the appropriate degree of G minor.



Appendix C. Interview questions

(1) What do you think about the correction code technique?
(2) Do you believe that this technique really helps you realize your errors and correct them?
(3) Do you want your teacher keep using this with different activities?