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## An Examination on the Usability of Concept Maps in the Teaching of Turkish Music Theory Courses

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### Abstract

This study aims to determine the usability of concept mapping technique as an auxiliary teaching material in teaching of Turkish Music Theory courses on basis of student views. This study also seeks to find out whether the ideas about the use of concept maps in Turkish Music Theory courses vary depending on 'gender' and 'class' variables. This research was created in survey design and a survey was used as a data collection tool. The study group consists of 63 students who participated in the five-week training given by the researcher. The data obtained from the study were analyzed by SPSS 15 statistics software. As a result of the research, the use of concept maps in the teaching of Turkish Music Theory course was found useful for effective learning and organization of the concepts related to this course. It was found that there was a significant difference between the participants' views of the concept maps on the 'usability of teaching' sub-dimension of Turkish Music Theory course, and their gender. Furthermore, there was a significant difference among the participants between 'usability of learning', 'organization' and 'effectiveness' sub-dimensions and the year of education.

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**Keywords:** Concept maps, Turkish Music, Turkish Music Theories, Maqam

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## Introduction

The use of new and different strategies, technology and various teaching materials is highly crucial and of great importance for more efficient and permanent teaching and education. The studies carried out and the findings obtained in the recent years clearly reveal the positive contribution of the diversity of methods, techniques and strategies to learning. An efficient practice to ensure more active use of different education - teaching strategies, methods and techniques in many educational fields is the use of concept maps in teaching.

Concept maps, first invented in mid-1970s, were developed in the scope of a project carried out by the alumni of Novak and Cornell Universities (Kaptan, 1998, p.95). Concept maps, developed on the basis of Ausubel's theory, are the learning tools by which individuals organize their knowledge by associating their prior knowledge with currently acquired knowledge or building connections between them and visualizing them in form of diagrams or maps (Novak, Gowin and Johansen, 1983; Demirel, 2010). Novak and Gowin (1984, p.15) suggest that concept maps are aimed at constructing meaningful relationships between concepts and manifesting them in form of propositions. Propositions are the symbols of two or more concepts associated with words in a semantic unit. Taşpınar (2004, p.104) indicates that concept maps function as a teaching method aimed at examining and visualizing the relationship between the knowledge and concepts from the general to the specific, and thereby acquiring concrete knowledge. Kemertaş (2017, p.198), on the other hand, describes concept maps as one of the graphical tools developed in the teaching of concepts with a view to better concretize learning and teaching of concepts.

Concept maps are grouped under various categories in the literature. Sönmez, (2011, p.233), for example, categorized concept maps in four classes, which are spider maps, chain of events maps, hierarchy and fishbone diagrams. Tokcan (2015, p.68), on the other hand, classified them as spider maps, chain of events maps, classification maps, flow diagrams and hierarchy maps. In the literature, concept maps may be classified as spider maps, hierarchy maps, flow diagrams and system maps (Chardan, 1985, p.58; All, Huycke and Fisher, 2003). Spider maps, hierarchy maps and flow diagrams were employed as the concept maps in this study in the training provided for the research group.

Sönmez (2008, p.367) discussed that concepts have their scientific, intellectual and artistic definitions, the steps of learning cannot be achieved before definitions or descriptions of concepts are learned, the learning starts with concepts, and therefore concept maps are critically important in meaningful learning. Similarly, Gürbüz (2006, p.137) uses the analogy of roadmaps to describe concept maps, suggesting that concept maps signify concepts and the relationships between concepts just like roadmaps that show locations and the routes connecting them. Novak and Gowin (1984, p.15)

stated that concept maps are useful not only for students but also for teachers as they manifest the basic ideas which must be focused to learn the desired subject.

There are numerous studies carried out on the use of concept maps in the teaching process as a teaching material. (Kalaycı and Çakmak, 2000; Turan and Boyraz, 2004). In the fields of social sciences, there have been a large number of articles written on the use of concept maps in education (Altıntaş and Altıntaş, 2008; Yılmaz and Çolak, 2012), life sciences (Kaptan, 1998; Frederiksen, White and Gutwill, 1999; Lee and Law, 2001; Ayvacı and Devocioğlu, 2002; Özdemir, Ülker, Uyguc, Huyugüzel, Çavaş and Kesercioğlu, 2002; Kaya, 2003b; Altınok, 2004; Aykanat, Doğru and Kalender, 2005; Öner and Arslan, 2005; Kurnaz, 2010; Temelli, Arlı, Biber and Kurt, 2011; Akgündüz and Şenol, 2013; Demir and Sezek, 2019), biology (Jegede, Aleiyemola and Okebukola, 1990; Bahar, 2000; Kinchin, 2000; Çimer and Çimer, 2002; Kılıç and Sağlam, 2004; Türkmen, Çardak and Dikmenli, 2005; Güneş, Güneş and Çelikler, 2006; Özay Köse, 2014), physics (Çıldır and Şen, 2005; Çıldır and Şen, 2006; Kandil İnceç, 2008), chemistry (Cullen, 1990; Bayram, Sökmen and Savcı, 1997; Kaya, Doğan and Kılıç, 2005; Erdem, 2008), geography (Sever, Budak and Yalçinkaya, 2009; Tuna, 2013), mathematics (Harper, Mallette, Maheady, Brennan, 1993; Baki and Mandacı Şahin, 2004; Uyangör and Üzel, 2005; Ata and Adıgüzel, 2011; Doğan and Aksu, 2016; Horzum, 2018), organization of teaching materials (Cliburn, 1986), planning and evaluation in teaching (Yılmaz, Tamer and Koç, 2009), computer science (Bruillard and Baron, 2000; Gedizgil and Deryakulu, 2008), Turkish language (Acat, 2003; Öztürk and Ömeroğlu, 2015), accounting (Chen, 2003; Irvine, Cooper and Jones, 2005; Maas and Leaby, 2006; Balsarı and Aslanertik, 2007; Simon, 2007; Leaby, Szabat and Maas, 2010; Ertan, Yücel and Saraç, 2014), business administration (Kalkan and Uğuz, 2010), nursing (All, Huycke and Fisher, 2003; Harpaz, Balık and Ehrenfeld, 2004; Gul and Boman, 2006; Karayurt, Dicle and İstan, 2006; Dil and Öz, 2014), and religion (Çakmak, 2018).

A variety of studies have revealed that the use of concept maps increases student success and meaningful learning (Novak, Gowin and Johansen, 1983; Lehman, Carter and Kahle, 1985; Okebukola and Jegede, 1988; Mayer, 1989; Wallece and Mintzes, 1990; Chen, 2003; Akinsanya and Williams, 2004; Kılıç and Sağlam, 2004; Özsoy, 2004; Kaya, Doğan and Kılıç, 2005; Öner and Arslan, 2005; Candan, Türkmen and Çardak, 2006; Maas and Leaby, 2006; Sarıca and Çetin, 2012; Akgündüz and Şenol, 2013; Doğan and Aksu, 2016; Kara and Kefeli, 2018; Bektüzün and Yel, 2019). There are also other studies performed on the use of concept maps as an evaluation tool in the literature (Şahin, 2002; Kaya, 2003a; Kandil İnceç, 2008; Kırkkılıç, Maden, Şahin and Girgin, 2011; Bilici, Doğan and Avcı, 2015) and the effect of concept maps on the reading/ listening comprehension skills (Durukan and Maden, 2010).

Although concept maps are employed abundantly in almost every field, there has been only one study in the literature on the use of concept maps or their feasibility for use in field of music. Gürgen and Öztopalan (2015) performed their study on the concept mapping based on group activity in the course titled History of Music by applying an open ended survey to identify students' views on the subject. The study revealed that concept mapping is helpful particularly in understanding a subject, ensuring permanence of learning, making an overview on the topic and building a relationship between concepts.

According to the data obtained from the conducted researches, concept maps help learners clearly see the relationship between concepts, and permanent learning is possible when visualized by hierarchical illustration. Through a connection made between prior and new learning, students not only recall their prior knowledge but also experience meaningful learning as they pay effort to build a relation between prior and new data. Accordingly, there has been a need to carry out a study on the usability of the concept mapping technique in the Turkish Music Theory course which contains knowledge of numerous maqams and theoretical knowledge. This study was initiated on the basis of the assumption that students who experience difficulty in memorizing maqams, the dominant or tonic of maqams, their scale and progression characteristics can use concept maps to easily memorize associated maqams or the characteristics of a single maqam. The usability of concept maps in Turkish Music Theory course as a teaching material was also addressed and examined in terms of students' views. This study is of importance in the sense that it has been the first study performed on the usability of concept maps in teaching in the field of Turkish Music.

### **Purpose**

This study aims to determine the usability of concept mapping technique as an auxiliary teaching material in teaching Turkish Music Theory courses through student views. In addition, this study seeks to find out whether the ideas about the use of concept maps in Turkish Music Theory courses vary depending on 'gender' and 'class' variables. In line with the goals stated above, answers were sought for the following questions:

- i. What are the students' views on the use of concept maps in teaching and learning of the Turkish Music Theory class?
- ii. Is there a significant relationship between participants' views on the feasibility of concept maps for use in teaching in field of Turkish Music Theory, and the variables of gender and educational year?

### **Methodology**

#### **Research Pattern**

This study was carried out in descriptive survey design. Descriptive survey designs are the research approaches that are aimed at describing the models as they are in their prior or current condition (Karasar, 2007, p.77). The purpose of this study is to identify student views on the use of concept maps in teaching and learning of the Turkish Music Theory class.

### **Research Group**

The research group was selected by 'convenience sampling' method, which is a type of non-probability sampling. This type of sampling was chosen due to the fact that the researcher would not be able to provide the five-week teaching program on the use of concept maps in Turkish Music Theory classes in other cities and institutions. The research group consists of 63 individuals who were chosen among the students studying at Turkish Music Conservatory of Yıldırım Beyazıt University and who took Turkish Music Theory classes and attended the class within the five-week period in which concept maps were included in the teaching process.

### **Data Collection Tool**

For collection of the research data, the researcher employed the survey developed by Kalkan and Uğuz (2010) and consisting of 27 questions to identify student views on the use of concept maps in the teaching process. The survey was designed as a 5-point Likert type scale, with categories ranging between "strongly agree (5)" and "strongly disagree (1)". Accordingly, the scores that may be obtained from the survey range between 27 and 135 points. The written consent of the inventors of the scale was obtained for the use of the scale in this study. MindMup and Mindmeister computer software were used for creating the concept maps.

### **Data Collection and Analysis**

This study was carried out in frame of the Turkish Music Theory classes. The research group were taught the concept maps for a five-week period in Turkish Music Theory classes, and the concept maps were also used in the classes. The concept maps were used in such a manner that will summarize the subject at the end of the class, and for the purposes of remembering and repeating the topics of the previous class at the beginning of each class.

In the first week, the students were informed about the concept maps, their current and possible use in music; types of concept maps were taught - by showing exemplary concept maps in field of music -. In the second week, maqams in Turkish Music were converted into concept maps, with their structures and tonic notes taken as basis, according to the classification made by Kutluğ (2000, p. 7-13) and explained to the students. Since it was not possible to include all maqams that are



progression was shown by hierarchical concept mapping (See Figure 1). General characteristics of the maqam addressed in the class and maqams of the same family were shown by spider mapping. For example, the Hicaz family was taught by designing and using both hierarchical concept maps (See Figure 2) and spider map (See Figure 3).

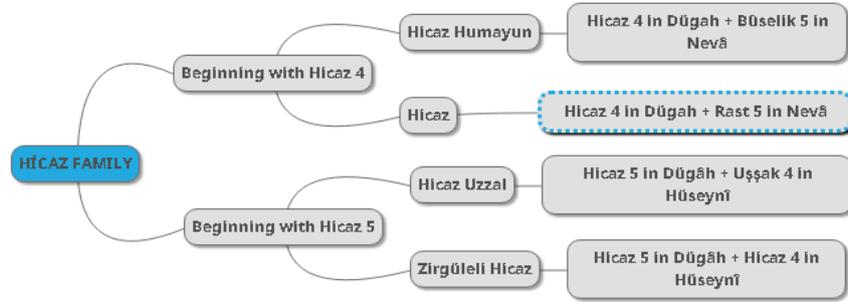


Figure 2. Illustration of Hicaz group by spider map

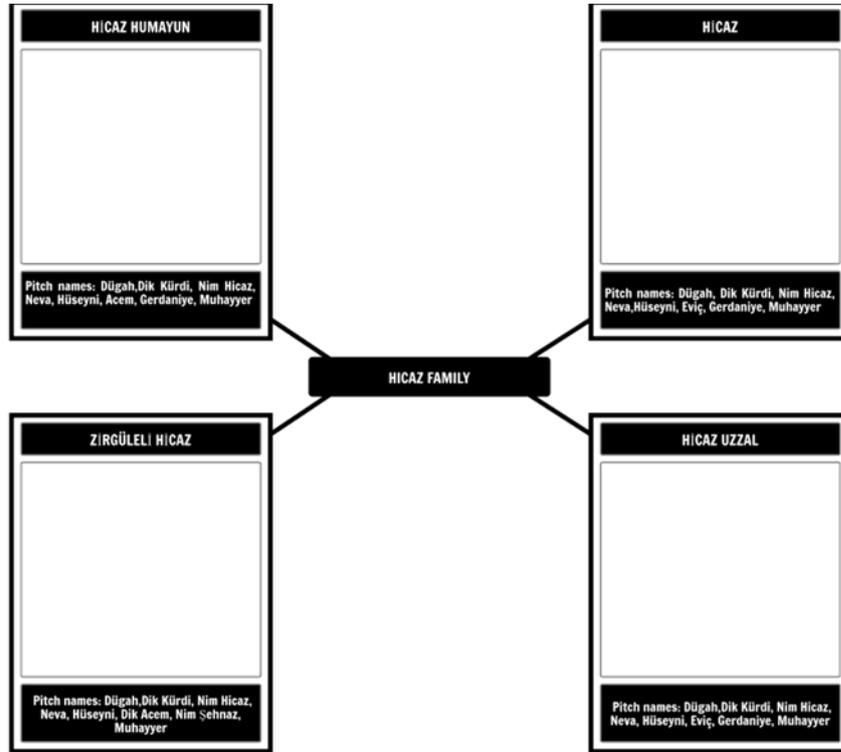


Figure 3. Illustration of Hicaz group by hierarchy map

At the final week of the five-week teaching process in which various concept mapping modalities were shown, the students were ensured to perform progression / taksim of the maqam taught during that period and their errors were corrected by their classmates and the teacher. By doing so, the students had the opportunity to implement concept mapping technique and correct their errors. During the final week, the students were asked to draw a concept map regarding the newly

learned maqam and topic; the concept maps drawn by them were interpreted by teachers and the errors made were corrected by the students.

Upon the completion of the five-week teaching and implementation process, the students' views were received on the use of concept mapping in Turkish Music Theory classes; a survey was applied to the students in order to find out the effect of concept maps on the students' learning. During this process, the survey consisting of 27 questions was employed to receive students' views on the teacher's use of concept maps in the teaching process and the students' use of concept mapping in their learning processes. During the survey, the students were asked to answer questions about the Turkish Music Theory class.

The data collected from the survey were analyzed using SPSS 15 software. The frequency and percentage values of the data were calculated for purpose of their analysis. The "t- test for independent samples" was conducted to reveal whether gender has an effect on the students' answers. The comparative one-way analysis of variance was employed to find out if the feasibility of concept maps for use in Turkish Music Theory differ by the 'class' variable.

### Findings

In this study, 66.1% of the participants are male. The majority of the participants are 21 (12.9%) and 22 (14,5%) years old. 56.5% of the participants are in the age range of 19-24. Moreover, 40.3% of the participants are 1st year students, 25.8% are 2nd year students, 19.4% are 3rd year students, 6.5% are 4th year students and 8.1% are graduate students. The fact that 66.1% of the participants mainly consists of 1st and 2nd year students is associated with the fact that, on the date of the study, the Turkish Music Theory course was obligatory for the 1st and 2nd year students and elective for other students.

Kolmogorov-Smirnov test was performed, with skewness and kurtosis values checked, to identify if the data exhibit normal distribution in the study. According to George and Mallery (2010), skewness and kurtosis values noted between -2 and +2 demonstrate that the data show normal distribution. In this study, skewness value was -0,074, and kurtosis was -1,150. Additionally, the results obtained from Kolmogorov Smirnov test also point out that the research data have normal distribution ( $p>0,05$ ). Moreover, individual tests of normality were conducted for six sub-dimensions of the survey; skewness and kurtosis for each sub-dimension were between -1 and +1. This also demonstrated normal distribution of the research data. Thus, the research data were analyzed by using parametric tests.

KMO value and Bartlett test were used to check if factor analysis can be applied to the items of the survey used in this study. As the KMO value was 0,828 and Bartlett test yielded  $\alpha=0,000$ , it was

considered that the sample group has adequate size for factor analysis. Results of the factor analysis on the survey items are shown in Table 1.

Table 1. *Results of factor analysis*

Item No		Factor Load	Explanatory Ratio (%)	
<b><i>Feasibility for use in learning</i></b>				
11	I learned the concepts more easily.	0,621	22,552	
12	I can perform repetition of the subjects by using concept maps.	0,794		
13	I can summarize the subject more easily.	0,721		
14	Concept maps ensured visual enrichment	0,529		
15	I think that concept maps are easy and comprehensible.	0,675		
16	They completed my deficient prior knowledge.	0,502		
17	The figures or diagrams used in the concept maps made abstract concepts more comprehensive and facilitated my learning.	0,821		
19	They ensured me to have an effective and permanent learning experience.	0,571		
25	Learning by concept maps replaces rote learning.	0,620		
26	I believe that concept maps will be useful when studying for the exams.	0,713		
27	From now on, I will create my own concept maps when studying for my exams	0,576		
<b><i>Organizing</i></b>				
1	Concept maps helped me build connections between topics and sub-topics.	0,658		19,35
2	Concept maps helped me see concepts collectively and in an organized manner.	0,856		
3	Concept maps ensured organized presentation of the information	0,639		
4	Concept maps helped me better comprehend complicated topics.	0,715		
6	Concept maps enabled me to better review the information.	0,657		
7	They increased my level of comprehension on the subject.	0,793		
<b><i>Feasibility for use in teaching</i></b>				
20	I believe that the use of concepts maps in other classes will improve my success in lessons.	0,513	11,494	
22	Concept maps should also be used in books.	0,544		
23	Concept maps are the most effective method that can be used in education	0,758		
24	Concept maps are the most effective method that can be used in assessment and evaluation.	0,822		
<b><i>Effectiveness</i></b>				
5	Concept maps helped me see the subject in a holistic manner.	0,597	9,623	
18	Concept maps reduced the time I spend for learning	0,682		
<b><i>Motivation</i></b>				
8	Concept maps improved my interest in the class and my concentration	0,858	8,688	
9	Concept maps helped me enjoy my time learning in the class.	0,587		
<b><i>Feasibility for use in exams and group activities</i></b>				
10	The concept map that I developed with my group improved my social relationship with my classmates.	0,687	5,062	

21 I can consider filling a concept map in written exams.

0,819

Total Variance: 76,770%

KMO= 0,828; Barlett test: 1258,750; Significance (p)&lt; 0,001

Factor analysis was applied to the items of the survey used in this research. When the total variance was explained, there were 6 factors in the survey. All 6 factors account for % 76,770 of the total variance. According to the common contents of the items they contain, they were named as 'usability in learning', 'organization', 'usability in teaching', 'effectiveness', 'motivation', 'usability in group work and exams'. An analysis was performed to identify the reliability level of the scale, using the Cronbach's alpha coefficient as an internal consistency coefficient; the analysis revealed that the scale is highly reliable with the reliability coefficient 0,93 (Kalkan and Uğuz, 2010, p.76-77). The frequency and percentage distributions of the answers given by the participants to each of the items as well as the mean scores and standard deviations of the items are listed and explained in the table below.

Table 2. Percentage distributions, mean scores and standard deviations of the participants' views on the usability of concept maps in the Turkish Music Theory course.

Items	%					$\bar{X}$	Ss
	Strongly Disagree	Disagree	Unstable	Agree	Strongly Agree		
1	-	-	12,7	33,3	54,0	4,4127	0,71018
2	-	1,6	7,9	38,1	52,4	4,4127	0,71018
3	-	-	7,9	39,7	52,4	4,4444	0,64202
4	-	1,6	14,5	30,6	53,2	4,3548	0,79128
5	-	1,6	15,9	25,4	57,1	4,3810	0,81178
6	-	-	9,5	47,6	42,9	4,3333	0,64758
7	-	-	11,1	47,6	41,3	4,3016	0,66320
8	-	1,6	21,0	45,2	32,3	4,0806	0,77456
9	-	3,2	22,2	33,3	41,3	4,1270	0,87052
10	4,8	12,9	32,3	27,4	22,6	3,5000	1,12716
11	-	1,6	14,8	45,9	37,7	4,1967	0,74877
12	-	3,2	19,0	36,5	41,3	4,1587	0,84637
13	-	-	7,9	49,2	42,9	4,3492	0,62627
14	-	1,6	6,5	41,9	50,0	4,4032	0,68854
15	-	1,6	8,1	46,8	43,5	4,3226	0,69599
16	-	-	20,6	44,4	34,9	4,1429	0,73741
17	-	-	12,7	50,8	36,5	4,2381	0,66513
18	1,6	4,8	14,3	44,4	34,9	4,0635	0,91357
19	-	-	16,1	43,5	40,3	4,2419	0,71713
20	-	-	19,0	46,0	34,9	4,1587	0,72304
21	6,5	6,5	21,0	38,7	27,4	3,7419	1,12986
22	-	-	15,9	41,3	42,9	4,2698	0,72304
23	3,2	6,5	25,8	35,5	29,0	3,8065	1,03763
24	1,6	6,5	29,0	38,7	24,2	3,7742	0,94815

25	-	6,3	17,5	47,6	28,6	3,9841	0,85179
26	-	1,6	9,5	38,1	50,8	4,3810	0,72798
27	-	6,3	17,5	42,9	33,3	4,0317	0,87930

Note: The items which are not marked in the table are indicated with “-”.

As seen in Table 2, it was revealed that the participants chose the answers ‘agree’ and ‘totally agree’ more frequently than other choices. According to the participants' views, the use of concept maps in Turkish Music Theory courses helps to establish the connections between the topics and sub-topics, enables them to see the concepts together and in an organized way, helps to learn complex subjects better, enables to see the subject completely and makes it easier to review the information. It also increases the focus on the course, facilitates learning the concepts, provides visual richness, makes it easier to repeat the subjects and summarize the subjects in a shorter time, and makes the course enjoyable. In addition, participants think that the use of concept maps in Turkish Music Theory courses will eliminate the need for rote teaching, will be useful in preparing for exams, and can be used in education, written exams, books and evaluation. The participants reported that the use of concept maps will also improve their success in other classes, and they considered creating concept maps when studying for their exams. The participants stated that they were undecided with their answers to the item ‘the concept map that I developed with my group improved my social relationship with my classmates’ (article 10). The data from the results obtained reveal that concept maps can be used in Turkish Music Theory classes.

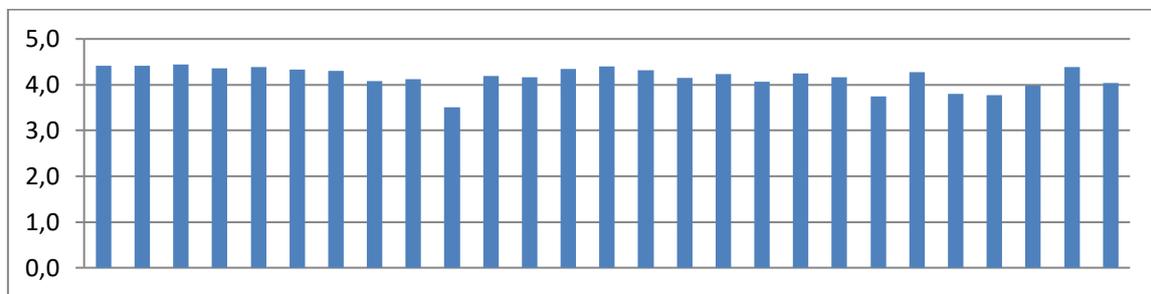


Figure 4. Average scores of the items

The mean scores of each item in the survey were obtained; these scores are presented in figures in Table 2 and as illustrations in Figure 4. Figure 4 shows that the mean scores of answers to each item are 3.5 and above. It is observed that the mean scores for the items numbered 10, 21, 23, 24, 25 were 3.5-4.0, and all of the other items were above 4.0. The highest mean score is obtained from the item 3 “Concept maps ensured organized presentation of the information” ( $\bar{x}=4,4444$ ). This item is followed by the items 1 and 2. ( $\bar{x}=4,4127$ ). These items contain the statements that concept maps help building connections between topics and sub-topics, and seeing concepts collectively and in an organized manner. Indeed, the factor analysis on these three items pointed out to the same factor, which is named as ‘organizing’. In this research, concept maps were found to be most useful in

organizing information. The ability to organize is very important in the teaching and learning of the Turkish Music Theory, which includes a large number of *maqams* and *usuls* and at the same time many musicologists interpret it in many different ways.

The lowest mean score in this study is obtained from the item 10 “The concept map that I developed with my group improved my social relationship with my classmates” ( $\bar{x}=3,50000$ ). This is followed by the item 21 “I can consider filling a concept map in written exams” ( $\bar{x}=3,7419$ ). These two questions with the lowest average are grouped under the same factor, which is ‘feasibility for use in exams and group activities’. The data obtained indicate that the participants prefer to create concept maps individually, not in groups. This may be explained by the fact that individual differences in thinking and learning styles manifest themselves in conceptual thinking. During the five-week training provided for the group of participants, concept maps were used - by teachers and students - as an auxiliary material in learning of the subjects. As this process does not cover the exam and the exams do not contain questions about concept maps, the participants do not know what they will encounter if they see questions about concept maps in the exam. The fact that the participants are undecided about the use of concept maps in assessment- evaluation and exams might be due to their lack of knowledge on how the use of concept maps in exams will be evaluated and their tendency to maintain the examination system they are familiar with.

An independent variable t-test was performed to assess whether all sub-dimensions of the survey applied to the participants for assessment of the feasibility of concept maps in Turkish Music Theory classes indicated a significant change by the variable of ‘gender’. The data obtained are shown in Table 3, with comments given below the table.

Table 3. Results of the t-test by which the participants’ views were compared by the variable of gender

Subscale	Group	N	Mean( $\bar{X}$ )	Standard deviation (Ss)	t	df	p																																																								
Usability in learning	Female	21	4,300	0,565	0,704	60	0,484																																																								
	Male	42	4,190	0,592				Organizing	Female	21	4,468	0,498	0,720	60	0,474	Male	42	4,360	0,587	Usability in learning	Female	21	4,250	0,524	2,119	54,617	0,039	Male	42	3,900	0,760	Effectiveness	Female	21	4,381	0,650	1,160	60	0,251	Male	42	4,146	0,800	Motivation	Female	21	4,285	0,643	1,158	60	0,251	Male	42	4,061	0,759	Usability in exams and group activities	Female	21	3,619	0,669	0,050	60	0,961
Organizing	Female	21	4,468	0,498	0,720	60	0,474																																																								
	Male	42	4,360	0,587				Usability in learning	Female	21	4,250	0,524	2,119	54,617	0,039	Male	42	3,900	0,760	Effectiveness	Female	21	4,381	0,650	1,160	60	0,251	Male	42	4,146	0,800	Motivation	Female	21	4,285	0,643	1,158	60	0,251	Male	42	4,061	0,759	Usability in exams and group activities	Female	21	3,619	0,669	0,050	60	0,961	Male	42	3,609	0,711								
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	Male	42	3,609	0,711																																																											

According to the results of the t-test given in Table-3, no significant difference could be found between the sub-dimensions 'usability in learning', 'organizing', 'effectiveness', 'motivation', 'usability in exams and group activities', and the variable of gender. The only significant difference was between the sub-dimension 'usability in teaching' and the variable of gender [ $t(54,617)=2,119$   $p<0,05$ ]. Total mean scores of female participants ( $\bar{x}=4,250$ ) in the sub-dimension 'usability in teaching' are higher than those of male participants ( $\bar{x}=3,900$ ). This finding revealed that, in comparison with male participants, female participants of the study reported more positive views on the usability of concept maps in teaching.

One way analysis of variance was performed to examine if the data in this study exhibit homogeneous distribution by the 'year of education'; it was found out that the variances of all sub-dimensions except for 'motivation' exhibit homogeneous distribution. The one-way analysis of variance was employed to find out if the feasibility of concept maps for use in Turkish Music Theory differ by the 'year of education' variable. According to the results of the Anova test, a significant level of difference was found between the sub-dimensions of 'usability in learning', 'organizing' and 'motivation', and the variable of 'year of education'. In order to examine between which years of education these differences are noted, Bonferroni test was applied as a Post-Hoc test for the other two sub-dimensions of the survey except for 'motivation', for which Games-Howel test was used as variances did not exhibit homogeneous distribution. With the sub-dimension 'usability in learning' of the survey, a significant difference was found between 1st and 4th years of undergraduate education. An examination of the mean scores for the years of education in the sub-dimension 'usability in learning' ( $\bar{x}=4,954$ ) indicates that the year with the lowest mean score was the 1st year of undergraduate education ( $\bar{x}=4,029$ ). This indicates that the participants in the 4th year of their undergraduate education have more positive views about the usability of concept maps in learning as compared to the participants in the 1st year of their undergraduate education. With the sub-dimension 'organizing' of the survey, a significant difference was found between 1st and 4th years of undergraduate education. An examination of the mean scores for the years of education in the sub-dimension 'organizing' ( $\bar{x}=5,000$ ) indicates that the year with the highest mean score was the 4th year of undergraduate education while the year with the lowest mean score was the 1st year of undergraduate education ( $\bar{x}=4,160$ ). According to the data provided hereinabove, the participants in the 4th year of their undergraduate education reported more positive views on achievements in terms of organizing than the participants in the 1st year of their undergraduate education. With the 'motivation' sub-dimension of the survey, a significant difference was found between the 1st, 3rd and 4th years of undergraduate education, and graduate education. An examination of the mean scores for the years of education in the 'motivation' sub-dimension ( $\bar{x}=5,000$ ) indicates that the year with the

highest mean score was the 4th year of undergraduate education while the year with the lowest mean score was the 1st year of undergraduate education ( $\bar{x}=3,880$ ). According to the data provided hereinabove, the participants in the 4th year of their undergraduate education reported more positive views on achievements in terms of motivation than the participants in the 1st year of their undergraduate education. Generally, the data obtained reveal the view that concept maps will be more useful in following stages as compared to the initial stage.

### **Conclusions, Discussion and Suggestions**

The data obtained from this study have revealed that the use of concept maps in Turkish Music Theory classes helped students more easily build connections between the subjects taught and address concepts collectively and in an organized manner, as well as helping them better learn complicated subjects and see the subject as a whole, enabling them to review knowledge and increasing their levels of comprehension and concentration in the class, helping them learn concepts better and more easily, and acquire skills like repeating the subjects in a shorter period of time and summarize the topics more easily. Additionally, the data obtained from this research indicate that the use of concept maps in Turkish Music Theory classes will eliminate the need for rote learning while helping students prepare for exams, and will be useful in education, written exams, books and assessment- evaluation. The results obtained present data that evidence the feasibility of concept maps for use in teaching in Turkish Music Theory classes.

Noteworthy, the obtained results reveal that the participants find concept maps the most useful in terms of organizing knowledge. The advantages offered by concept maps in terms of organizing are quite important in the teaching and learning of Turkish Music Theory, which contains a large number of maqams and usuls and a variety of different individual performances by numerous musicologists. The participants were mostly undecided about the contributions of the use of concept maps in teaching to group activities and their socialization. This may be interpreted to mean that the participants prefer using concept mapping individually for this class.

The study performed by Kalkan and Uğuz (2010, p.80), in which students' views on the feasibility of concept maps for use in education were received and the survey used in this research was employed as a data collection tool, yielded data which reveal that there is a significant difference by the variable of gender in favour of female students. On the basis of this result, this study seeks to answer the question of whether there is a relationship between the views on the feasibility of concept maps in Turkish Music Theory class and the variable of gender. According to the results of the t-test in which the participants' views on the feasibility of concept maps for use in Turkish Music Theory classes were compared by the variable of 'gender', there is a significant difference only between the

sub-dimensions 'feasibility for use in teaching' and 'gender'. In conclusion, it has been revealed that female participants of the study reported more positive views than male participants on the usability of concept maps in teaching.

In numerous studies performed in the literature regarding concept maps, the research group was determined by taking a specific year of education as basis (Çelikten, 2002; Duru and Gürdal, 2002; Tuncer and Kahveci, 2009). This study, however, comprises all of five different years of education. In order to determine the most suitable year of education to provide the relevant course, it is of significance to identify any significant difference between the years of education and the answers given. There was a significant difference between the participants 'usability in learning', 'organization' and 'effectiveness' sub-dimensions and the class they studied. It was found out that the participants in the fourth year of the undergraduate program think more positively about the contribution of concept maps to the learning of the Turkish Music Theory course, the organization of the concepts and subjects in this course, and the motivation towards the course. These results show that it is more meaningful to use concept maps in Turkish Music Theory courses in the later stages of teaching and not in the first stage of teaching.

The data obtained in this study support the data obtained in the researches showing that the use of concept maps in the literature increases student achievement and meaningful learning (Novak, Gowin and Johansen, 1983; Lehman, Carter and Kahle, 1985; Okebukola and Jegede, 1988; Mayer, 1989; Wallece and Mintzes, 1990; Chen, 2003; Akinsanya and Williams, 2004; Kılıç and Sağlam, 2004; Özsoy, 2004; Kaya, Doğan and Kılıç, 2005; Öner and Arslan, 2005; Candan, Türkmen and Çardak, 2006; Maas and Leaby, 2006; Sarıca and Çetin, 2012; Akgündüz and Şenol, 2013; Doğan and Aksu, 2016; Kara and Kefeli, 2018; Bektüzün and Yel, 2019). In addition, in the study conducted by Gürgen and Öztöpalan (2015) regarding the usability of concept maps in the field of music, it was concluded that concept mapping is useful, for example, in terms of ease of understanding the subject, retention of information, overview of the subject, and construction of relationships between concepts. The data obtained from this research support the results of the study by Gürgen and Öztöpalan.

In frame of the results obtained from this study, it is advised that concept maps should be employed as a teaching and learning material in Turkish Music Theory classes and in repeating previous classes. Concept maps should be used both by teachers and students in Turkish Music Theory classes. Acting from the data obtained from this study, it may be suggested that concept maps should be put into use in teaching of Turkish Music Theory, not at the initial stage but in subsequent stages after basic achievements have been made in respect of the course. Furthermore, it is considered that the use of concept maps in Theory classes will be beneficial in terms of learning, particularly for students with visual learning style. Also, the effect of concept maps on the success of students with

various learning styles may be studied. This subject may even be examined specifically in terms of Turkish Music Theory class. It is recommended that the studies on concept maps in the field of music, which are very few in number, should be increased and it should be so determined how and on which subjects this teaching method can be used in the field of music.

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