

Analysis of high school students' cognitive structures related to musical genre via word association test

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Suggested Citation:

Ozer, B. (2020). Analysis of high school students' cognitive structures related to musical genre via word association test. *Cypriot Journal of Educational Science*. 15(1), 127–143. <https://doi.org/10.18844/cjes.v15i1.4557>

Received from; August 12 2019; revised January 2, 2020; accepted February 1, 2020.

Selection and peer review under responsibility of Prof. Dr. Huseyin Uzunboylu, Near East University, Cyprus.

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Abstract

The aim of this study, via the Word Association Test, an alternative assessment and evaluation technique, to reveal the cognitive structures by determining high school students' perceptions about music genres. For this purpose, in the spring semester of 2015–2016 academic year, Data in the study is obtained with the participation of 100 students in 11th and 12th. Independent word association test was used to collect data. In order to create the test, music genres, namely, Turkish Folk Music, Turkish Art Music, Pop Music and Classical Western Music, were chosen as key concepts. The data were evaluated according to the content analysis; frequency values were given and divided into categories. In line with the findings of the research, the categories of 'cultural' related to the concept of Turkish Folk Music, 'instrument' about Turkish Art Music, 'rhythmic' about Pop Music, and 'instrument' related to Classical Western Music, answer words were produced.

Keywords: Concept, cognitive structure, musical genres, word association test.

1. Introduction

Information, although important during each moment of history, has become an important factor in the globalised world with increasing communication possibilities. In our century, the indisputable advantage is of those creating and using knowledge (MONE, 2006). Learning occurs when students existing concepts are associated with the ones taught. Therefore, determining and revealing the existing concepts in the cognitive structures of the students is an essential part of the learning process (Kurt and Ekici, 2013, p. 809).

According to Senemoglu (2002), 'concept is used for categorising similar objects, humans, events, ideas, and processes' (p. 513). Concepts are the constituents of knowledge. Concepts, like forming a building, are created with every bit of knowledge put on top of the other. Hence, the most important role in the academic success of the students is, attributed to the learning of concept. Problems occur in higher order learning without the teaching of concepts. This makes learning of concepts even more important. The realisation of these gains is possible with a constructivism approach that builds knowledge in education on previous gains.

In Turkey, since 2004, the schooling programs were redesigned based on a constructivist approach and began to be used. The music education program created by Instruction and Training Directorate of MONE was accepted according to the 29.05.2007 resolution of Primary Education General Directorate as Elementary Music Course (Grades 1–8) Program (MONE, 2006) and the Secondary Education Music Course (Grades, 9–12) Program (MONE, 2009) on the 17.12.2009 was accepted (Aksu, 2015).

Constructivism is a concept of learning in which, in a learner centric ambience, new knowledge, skill or behaviour is blended with the existing ones to create something anew. Constructivists consider learning as the result of cognitive restructuring. According to this, the student learns by blending the new knowledge with the old (Ataman & Okay, 2009).

Music classes, centred on abstract concepts, are important among the classes that require learning of concepts. The right configuration of concept association in students' minds, leads to correct and effective gains towards the cognitive target goals in music classes.

A Constructivist approach in music education:

- Highlights learning instead of teaching
- Accepts individual differences
- Supports students research
- Attaches importance to earlier experiences during the learning process
- Takes how students are learning into consideration
- Gives importance to students' learning in a social environment
- Highlights real and practical teaching.
- Supplies the students with the chance of creating knowledge and derive results from their experiences (MONE, 2006)

One of the important topics of both affective and cognitive of music lesson is music genres. Music genres that continue to be valid in the history of culture; It can be classified under three titles: traditional music, art music (classical music) and popular music. Today different types of music make people socialise, enables them to enjoy life as individually and socially. At the secondary education curriculum includes gains for music genres.

1.1. Acquisitions related to music genres in high school music programs

'Musical perception and understanding' field among the knowledge and conceptual perceptions in High School Music Curriculum is considered as very important. Some examples provided for the

acquisition in high school music classes (9–12th Classes) related to music genres and music conceptions are given below:

- 9th Grade: Classifies the music in our country according to music genres
- 9th Grade: Explains the general features of Turkish Folk Music
- 10th Grade: Explains the general features of the Baroque Period
- D.2 10th Grade: Explains the General features of the Classical Period
- 10th Grade: Exemplifies Baroque and Classical period composers
- D.5 10th Grade: Shares the results of research on Classical Period of Turkish Music History
- 11th Grade: Compares general features of Baroque, Classic, and Romantic period
- 11th Grade: Distinguishes international Art Music genres-styles
- 12th Grade: Explains the developmental process of popular music
- 12th Grade: Exemplifies composers, commentators, and their works of differing times during the development process of popular music in our country (MONE, 2009, p. 28).

In recent years, with the impact of constructivist approach on learning, traditional methods have given way alternatives in detecting cognitive structures, changing process of concepts and conceptual errors (Bahar & Ozatli, 2003; Ercan, Tasdere & Ercan, 2010). The most common and oldest one of the techniques analyzing student's cognitive structure, also to be employed in the present study, is the word association method.

In the literature, there are studies conducted in different fields, where the cognitive structures of different study groups related to certain concepts are examined through the 'word association test' (WAT). Kurt and Ekici (2013) are concerned with the concepts of 'osmosis', of biology teacher candidates. Kaya and Akis (2015) examined the cognitive structures of geography students regarding the concept of 'air'. Tokcan (2017) social studies teacher candidates 'cognitive structures related to the concept of 'Turkish World', Derman and Yaran (2017) 'water cycle' concept of high school students, Yigit and Kiyici (2019) teacher candidates' 'teacher' concept, through WAT. In addition, in the field of music, Kurtaslan (2018) elementary school students 'nota' concept, Gerekten (2018) music teacher candidates 'makam' concept, Kurtaslan, Aydin and Ozer (2018) are studies using the vocabulary assignment Test to determine the cognitive structures of the 'music teacher' concept of secondary and high school students. In this study, by using WAT, the cognitive structures of high school students for four different music genres (Turkish Folk Music, Turkish Art Music, Pop Music and Classical Western Music) were tried to be determined.

The aim of the present study is to determine the students have about different music genres and to reveal their cognitive structures using word association test, an alternative method of assessment. For this purpose, in this study, 'how are the conceptual structures of the high school students' related to the concept of music genre?' question is searched for an answer.

2. Methodology

'Case study' pattern, which is one of the qualitative research patterns, was used in this study. Compared to quantitative studies, qualitative studies enable to have deep insights especially about social events and psychological situations. Qualitative researches can be used to find answers to the questions that are rather hard to answer with traditional methods (Buyukozturk, Cakmak, Kilic, Karadeniz & Demirel, 2011, p. 254).

2.1. Study group

In the spring semester of 2015–2016 academic year in the Nevsehir Hacı Bektas Veli district, 11th and 12th grade volunteer students attending Hacibektas Anatolian High School and Vocational and Technical Anatolian High Schools participated in the research. The study group consisted of a total of

100 students, including 11th grade students (N: 39) and 12th grade students (N: 61). 63 of the students included in the research are girls, 37 of them are boys.

2.2. Data collection tools

A word association test was utilised as the data collection tool in the study. A total of four key concepts related to music genre thought to be underlying the topic and importance were selected. These concepts were (1) Turkish Folk Music, (2) Turkish Art Music, (3) Pop Music and (4) Classical Western Music.

2.3. Independent word association test

WAT relies on the answer students give to the key words given to them based on the concept. The words and sentences student use in their answers retrieved from their long term memory and their alignment are considered to reveal the cognitive ties between these words, the ties created between them and their affinity in terms of meaning in student's cognitive framework (Bahar, Johnstone & Sutcliffe, 1999).

Based on the views of two experts in the field of music education, one in Turkish language, and one in the field of assessment-evaluation, the word association test was prepared. In order to conduct the present study, permission was taken from the Nevsehir City Directorate of MONE. Afterwards, subsequent to the briefing Hacibektas Anatolian High and Vocational-Technical Anatolian High School directors and teachers, the time and date for data collection was determined. Before the execution, the students and the teachers were given necessary instructions about word association test. In order to create the test, four key concepts about music genres were given (Turkish Folk Music, Turkish art Music, Pop Music, Classical Western Music). During the administration, each concept was written 5 times one top of another so that each concept would be on a separate sheet. Bahar and Ozatli (2003), explained that the alignment of the WAT key concepts in such a way is to prevent the risk of chain answering.

Before the application, a pilot study was made for 10 students from the 11th (N: 5) and 12th (N: 5) classes, and after the necessary corrections were made in terms of paper layout, language and time, the main application was started.

In the first phase; explanations were made about the WAT and 1 minute was given for each construct about music genres. Relevant studies in the literature have given approximately 30 seconds for each concept in a WAT (Bahar et al., 1999; Bahar & Ozatli, 2003; Kaya & Akis, 2015). Since the participants were high school students, 1 minute was considered to be more appropriate than 30 seconds.

During the second phase, participants were asked to write down a sentence related to the key concept within 1 minute. The answer associated with the key concept could also be a reminder only that is totally out of context indicating an existing connotation. As the sentence in question is more complex and in a higher order compared to a single word answer, conditions, such as whether it is scientific or does include a conceptual error will affect the evaluation procedure (Kurt & Ekici, 2013).

A sample page alignment is given below:

- Four different music genres are written below. Please write the first word that is related with the music genre to the empty space next to? (Time: 1 minute)
Turkish Folk Music:
Turkish Folk Music:
Turkish Folk Music:
Turkish Folk Music:
Turkish Folk Music:

- Please make up sentences using the words that you have written above. **(Time: 1 minute)**

Turkish Art Music:.....

Turkish Art Music:.....

Turkish Art Music:.....

Turkish Art Music:.....

Turkish Art Music:.....

- Please make up sentences using the words that you have written above. **(Time: 1 minute)**

As seen above, WAT consists of two stages. In the first one, students write key concepts and at the second they write down a sentence using the key concepts given.

2.4. Validity and reliability

For a high validity, the data obtained must be well reported. In addition, it is necessary to state clearly how the result is achieved (Yildirim, 2010; Benibil & Erdogan, 2016). In order to ensure the validity of the research, the data were coded and categories were determined. In coding the data obtained from the KiT and determining the categories, the answer words, the number of answer words and related sentences were analysed. In categories presented in tables, frequencies of answer words are calculated.

In order to ensure the reliability of the research; the data were presented to the opinion of the two field experts to confirm whether codings determined by the researcher represent the categories. The opinions of the field experts about the separately codings made and the categories were compared. According to Kurt and Ekici (2013); the consistency of the codes used by the researchers independently from each other was determined by marking as 'consensus' or 'difference of opinion'. The situations in which the researchers used the same code for the students' expressions were considered to be consensus, and the situations where they used the different code were accepted as the disagreement. In the sections that were contradicted by a researcher, coding was made by taking the opinion of the other researcher. Reliability of data analysis made in this way; Calculated using the formula $[\text{Consensus} / (\text{Consensus} + \text{Disagreement}) \times 100]$ (Miles & Huberman, 1994). The average reliability among coders was 92%. The codings and categories that emerged in line with the opinions of the field experts were finalised.

2.5. Data analysis

The data were analysed in the Nvivo qualitative data analysis program. Similar metaphors identified in Nvivo are classified and categorised according to expert opinions. The metaphor categories, which include as percentage and frequency. According to Yildirim and Simsek (2011), the main idea behind content analysis is to reach out for concepts and relations among these to explain the data collected. Hence, data collected for this purpose are to be conceptualised, later arranged in a logical manner according to the emerging concepts and themes so that to explain the data which is yet to be defined. Thus, the concepts will lead to the themes and with the help of the themes facts could be better organised and become more understandable.

In this study, WAT was used as a tool for data collection. Firstly, data obtained via WAT were prepared for analysis. Subsequently, among the descriptive analysis techniques, the percentages and frequencies of the data obtained were calculated. A table of frequency was created for the key concept in order to show how many times a key word or concept was repeated. Therefore, in order to evaluate the results of WAT, all the answers given to the key concept were examined extensively. Then, the answers given to each key concept by the students were identified and a frequency table was created.

3. Results

In this part, the data obtained with the WAT are presented in categories. Word-answers to the key music genre are categorised and alternative concepts were determined. Music genres, in accordance to the given answer are categorised, frequencies calculated, and percentages determined. Words that have emerged only once or not associated with the topic have not been included. The total amount of words in each music genre is 101. The ones that are not categorised as they do not fit into a single category but are somehow related with the music genre are included under the 'others' title.

3.1. Results related to the response words given to stimulus concept 'music genre' and created categories

Table 1. Percentage and categorisation of the cognitive structures of high school students related to 'Turkish folk Music'

Categories	Frequency of concepts in categories	Total frequency of the category
Cultural	Culture (33)	141
	Traditional (21)	
	Regional (15)	
	Folk (22)	
	Turk (13)	
	Homeland/Country(9)	
	Folk Games (9)	
	Past (7)	
	Anatolia (6)	
	Core (6)	
Instrument	Baglama (75)	121
	Drum/tambourine (17)	
	Zurna (10)	
	Lute (4)	
	Violin (4)	
	Clarinet (3)	
	Ney (2)	
	Kaval (2)	
	Sipsi (2)	
	Kabak Kemane (2)	
Artist	Asik Veysel (23)	54
	Neset Ertas (14)	
	İbrahim Tatlıses (5)	
	Musa Eroglu (4)	
	Arif Sag (3)	
	Orhan Gencebay (3)	
	Zara (2)	
Theoretical knowledge	Turku (45)	74
	Lament (5)	
	Bozlak (9)	
	Ayak (5)	
	Mode (3)	
	Amorous (3)	
Total Word	Anonym (4)	34
Total Frequency		390

According to the data obtained, the answers given by the high school students about 'Turkish Folk Music' key concept are mostly within the category of 'cultural'. The frequency of the dominant 'cultural' categorise is determined as 141 equal to a frequency. In this category, whereas most participants have provided answers such as 'Culture' (33), 'Traditional' (21), 'Folk' (22), 'Regional' (15), others have provided answers such as 'Turk' (13), 'Homeland/country' (9), 'Folk Games' (9), 'Past' (7), 'Anatolia' (6) and 'Core' (6). This outcome verifies clearly that a close relationship between Turkish Folk Music exist with culture and cultural values.

In the second category, most of the participants revealed associations to 'Instrument'. The frequency of the words in this category is 121. The association made by the participants in this category is mostly with 'Baglama (a Turkish string instrument)' (75) at the first place. This clearly shows us that the students associate baglama more than anything does with Turkish Folk Music followed by Drum/tamborine (17), Zurna (10), Lute (4), Violin (4), Clarinet (3), Ney (2), Kaval (2), Sipsi (2), and Kabak Kemane (2). As lute, clarinet and pumpkin violin are mostly employed in Turkish Art Music, there is a conceptual error in terms of instruments.

The third category, as the answers provided are related with artists, is labelled as 'Artist'. The frequency of the words in this category is 54 equal the associations made by participants focus on Asik Veysel (23) and Neset Ertas (14) followed with ibrahim Tatlis (5), Musa Eroglu (4), Arif Sag (3), Orhan Gencebay (3), and Zara (2).

The fourth category consists of answers that include theoretical knowledge. The frequency of the words in this category is 74. The participants have focused on Turku (45) concept most in this category labelled as 'Theoretical knowledge' it is followed by Ayak (9), Lament (5), Bozlak (5). The rest associated it with Mode (maqam) (3), Amorous (3). The Mode, since used in Turkish Art Music, led to confusion in the students' minds. Except the mode concept, associations made with the key concept made by the students were correct.

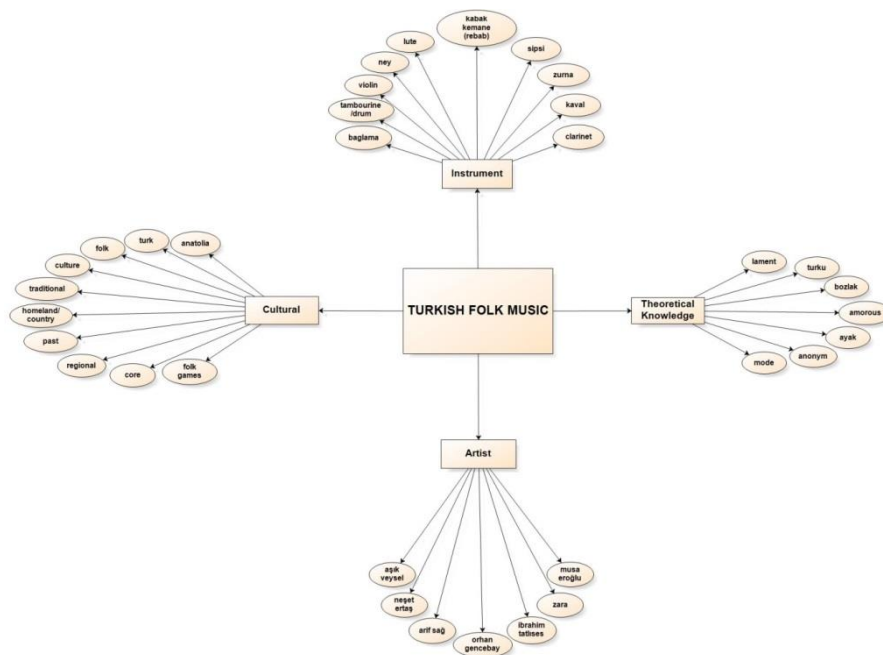


Figure 1. The conceptual network of high school students' with regard to 'Turkish Folk Music'

The concept network in Figure 1; demonstrates the cognitive schemas of high school students' related to the Turkish Folk Music stimulus word.

Table 2. Percentage and categorisation of the cognitive structures of high school students related to 'Turkish Art Music'

Categories	Frequency of concepts in categories	Total frequency of the category
Instrument	Lute (57)	147
	Qanun (35)	
	Ney (10)	
	Tambourine/darbuka (10)	
	Kemancha (9)	
	Violin (8)	
	Clarinet (5)	
	Mandolin (4)	
	Baglama (4)	
	Tambour (3)	
Artist	Guitar (2)	32
	Zeki Muren (21)	
	Muzyeyyen Senar (6)	
	Muazzez Ersoy (3)	
Theoretical knowledge	Bulent Ersoy (2)	45
	Mode (15)	
	Verse (11)	
	Koma (8)	
	Tempo (6)	
Others	Improvisation (5)	62
	Fasil (4)	
	Art (10)	
	Turk (9)	
	TRT (9)	
	Chorus (9)	
	Old (8)	
	Artist (7)	
Exaggerated (6)		
Total word		29
Total frequency		314

According to the data analysis made, answers given by the high school students to the key concept of 'Turkish Art Music' is clustered intensively around the category of 'Instrument'. The frequency of the 'Instrument' category is with 147 the most dominant the associations made by the participants in this category are focusing on Lute (ud) (57) in the first place. This shows us the instrument associated first with Turkish Folk Music is the Lute followed by Qanun (35), Ney (Reedflute) (10), Tambourine/darbuka (10), Kemancha (9), and Violin (8). The less favored associations are Clarinet (5), Mandolin (4), Baglama (4), Tambour (3), and Guitar (2). As the guitar is used more in the classical western music and pop music genres, some students could be assumed to have a misconceptions and conceptual fallacies regarding instruments. Yet the rest of the associations made by them clearly show that they have acceptable cognitive structures about Turkish Art Music.

In the second category consists of the answers related to artist; hence, this category is labelled therefore 'Artist'. The frequency of the key word-answers in this category is 32. The associations made by the participants heavily focus on Zeki Muren (21) followed by Muzyeyyen Senar (6), Muazzez Ersoy (3), and Bulent Ersoy (2).

The third category consists of the key word related answers including theoretical knowledge. The frequency of the key word-answers in this category is 45 equal to a 16.7% percentage. The participants focused on Mode (maqam) (15) and Verse (11) in the category of theoretical knowledge related to the genre of Turkish Folk Music. It is followed by Koma (8), Tempo (6), Improvisation) (5), fasil (4). The rest and the minority associated it with Mode (3) and Amorous (3). As it stands, this showed us participants made a right association and they have valuable cognitive structures.

The fourth category labelled as 'others' consists of the answers that could not be placed into any other category. The frequency of the 'others' category is 53. The concepts created by the volunteers are as follows: Art (10), Turk (9), TRT (9), Chorus (9), Old (8), Artist (7), Exaggerated (6), and Heavy (4). The conceptual network related to the conceptual structure of high school students' with regard to 'Turkish Art Music' is given in Figure 2.

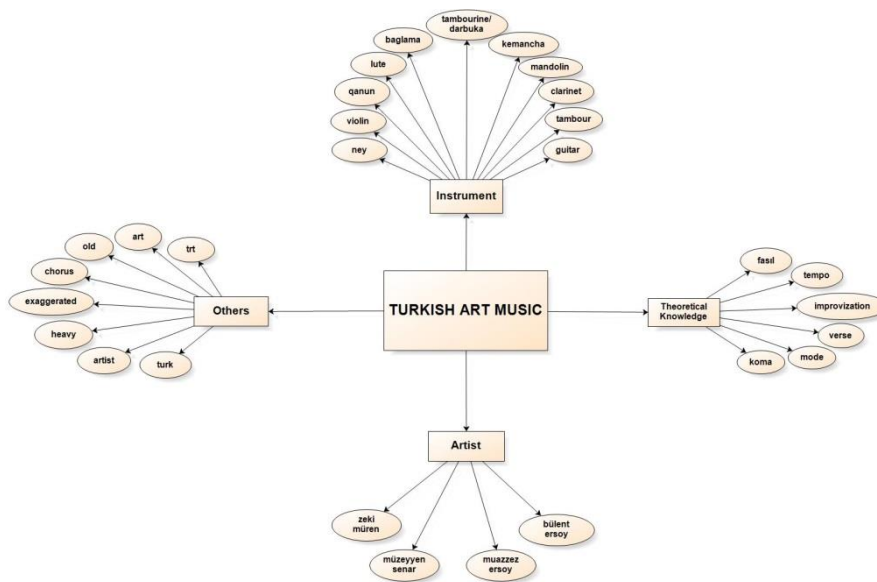


Figure 2. The conceptual network of high school students' with regard to 'Turkish Art Music'

The concept network in Figure 2; demonstrates the cognitive schemas of high school students' related to the 'Turkish Art Music' stimulus word.

Table 3. Percentage and categorisation of the cognitive structures of high school students related to 'Pop Music'

Categories	Frequency of concepts in categories	Total frequency of the category
Rhythmic	Moving/Lively (27)	64
	Rhythm (23)	
	Fast (14)	
Artist	Irem Derici (14)	57
	Mustafa Ceceli (12)	
	Hadise (10)	
	Sıla (8)	
	Hande Yener (7)	
	Demet Akalın (6)	
Instrument	Guitar (15)	48
	Timpano (9)	
	Keyboard (8)	
	Bass Guitar (7)	

	Drums (6)	
	Clarinet (3)	
Others	Famous (15)	
	Popular (14)	
	Contest (13)	
	Concert (12)	
	Dance (11)	
	New (11)	
	Youth (10)	
	Temporary/Instant (8)	116
	Celebrities (8)	
	Pop Star (7)	
	Sound (6)	
	Clip (3)	
	Hit (3)	
	Money (2)	
	Headset (2)	
	Disco (2)	
Total word		31
Total frequency		285

According to the data analyses, the answers given by the high school students in the first category to the key concept of 'Pop Music' are focusing on the category named 'Rhythmic'. The frequency of the key word-answers in the dominant category of 'Rhythmic' is 64. The 'Moving/Lively' (27) is on the top of the list as the most dominant association made related to this genre. This shows us that high school students associate moving/lively to pop music followed by rhythm (23) and Fast (14).

The second category is named 'Artist' as the students' answers are associated with various performers. The frequency of the answers given by the students in this category is 57. Most of the associations made by the students in this category are related with Irem Derici (21) followed by Mustafa Ceceli (12), Hadise (10), Sila (8), Hande Yener (7) and Demet Akalin (6). Compared to other genres of music, pop music is associated with most artists names.

In the third category the answers given by the high school students about the key concept of 'Pop Music' is grouped under the category of 'Instrument'. The frequency of this category is 48 equal to a percentage of 20.2%. The Guitar (15) is in the first place in the associations made by the students. Timpani (9), Keyboard (8), Bass Guitar (7), and Drums (6) follow it. Clarinet (3) on the other hand, is associated the least. According to the results, the associations made by the students in the 'Instrument' category are correct.

The fourth category is clustered under the title of 'Others' as the associations made cannot be placed under any other the category but are frequent among the concepts mentioned by the students. This category has a frequency of 116, which is quite high. It goes as follows: Famous (15), Popular (14), Contest (13), Concert (12), Dance (11), New (11), Youth (10), Temporary/Instant (8), Celebrities (8), Pop Star (7), Sound (6), Clip (3), Money (2), Headset (2), and Disco (2). The conceptual network related to the conceptual structure of high school students' with regard to 'Pop Music' is given in Figure 3.

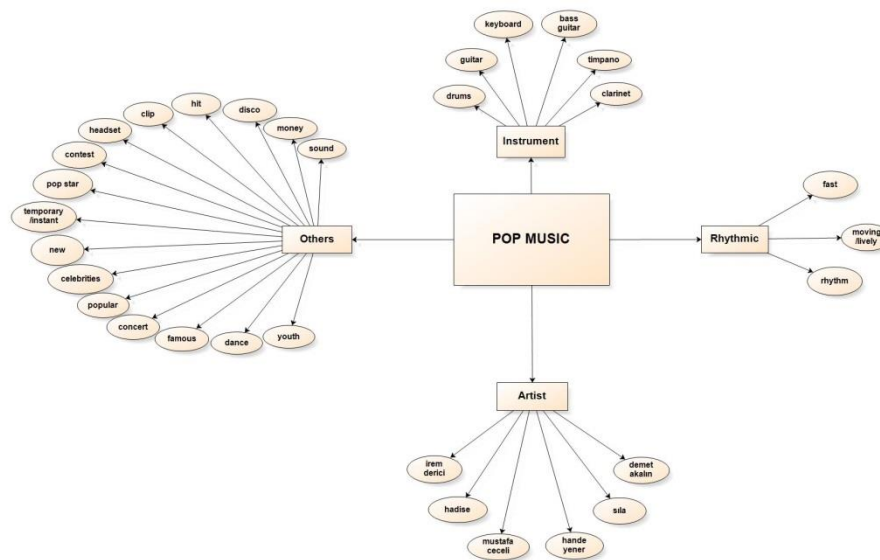


Figure 3. The conceptual network of high school students' with regard to 'Pop Music'

The concept network in Figure 3 demonstrates the cognitive schemas of high school students' related to the 'Pop Music' stimulus word.

Table 4. Percentage and categorisation of the cognitive structures of high school students related to 'Classic Western Music'

Categories	Frequency of concepts in categories	Total frequency of the category
Instrument	Flute (16) Piano (14) Violin (12) Guitar (8) Harmonica (6) Timpano (6) Clarinet (6) Kemancha (4) Lute (3) Cello (3)	78
Artist/Work	Mozart (12) Beethoven (9) Vivaldi (3) Turkish March (5) Moonlight (3)	32
Continent/Country	Europe (10) America (5) England (3) Germany (2)	20
Period	Baroque (2) Classic (9)	11
Others	Less Listened (9) Slow (8) Western (7) Background Music (4) Opera (3)	39

	Musician (3)
	Old Ages (3)
	Palace (2)
Total word	29
Total frequency	180

The analysis of the answers given by the students in the first category about the key concept of 'Western Classical Music' reveals that they are clustered mainly around 'Instruments'. The 'Instrument' category, as the most dominant one, has a frequency of 78. The 'Flute' (16) is in the first place according to the answers given by the participants followed by Piano (14), Violin (12), Guitar (8), Harmonica (6), Timpano (6), and Cello (3) respectively. It can be said that some students had a dilemma and conceptual errors regarding their knowledge on instruments as some of them had written *Kemanca* (4) and *Lute* (3) which are used in Turkish music as the least favoured answers. However, the other answers given by the students are correct associations related to 'Classical Western Music'.

The second category is named 'Artist/Work' as the students' answers are associated with either the artist or the musical work. The Frequency of the word-answers given by the participants is 32. The associations made by the participants are Mozart (12), Beethoven (9), and Vivaldi (3). The 'Turkish March' of Mozart and the 'Moonlight Sonate' of Beethoven is associated as the related musical works by the students. However, while making these associations, artists' names were not mentioned; but, the musical work per se.

In the third category, continents/countries rise to prominence. In this category, the frequency of the answers provided by the participants is 20. Participants associated with Classical Western Music concepts like Europe (10), America (5), England (3), and Germany (2).

In the fourth category, the 'Period' appeared as a concept itself in the associations made by the students related to classical western music. The answers given by the attendants related to this category have a frequency of 11. Attendants associated Classical Western Music with Classic (9) and Baroque (2) periods correctly.

The fifth category is named ad 'Others' which could not be placed within the other four categories; however, were quite frequently mentioned. This cluster has a frequency of 39. In this category, the answers were associated with the following: Less Listened (9), Slow (8), Western (7), Background Music (4), Opera (3), Musician (3), Old Ages (3), and Palace (2).

Each of the sentences made by the students about the key concepts related to different music genres were examined and categorised considering the table developed by Ercan and Tasdere (2012). In this table, related sentences were categorised as; sentences that include scientific information, unscientific sentences and sentences that include superficial information as well as sentences that include conceptual errors.

The conceptual network related to the conceptual structure of high school students' with regard to 'Classical Western Music' is given in Figure 4.

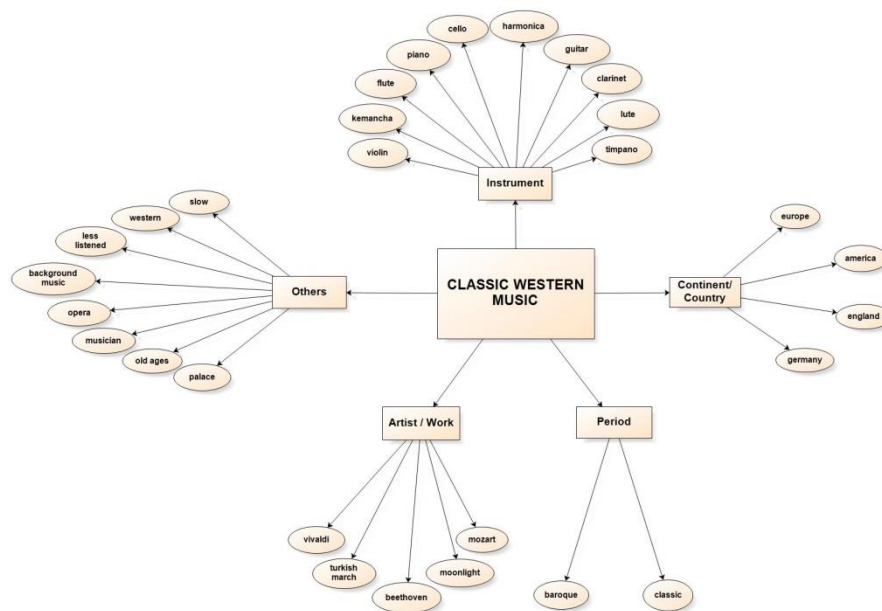


Figure 4. The conceptual network of high school students' with regard to 'Classical Western Music'

The concept network in Figure 4; demonstrates the cognitive schemas of high school students' related to the 'Classical Western Music' stimulus word.

3.2. Results related to the sentences made by the students in categories about music genres

Table 5. The sentences made by the students in categories about music genres

Key concepts	Sentences that include scientific knowledge	Sentences nonscientific or with superficial knowledge	Sentences with conceptual errors	Empty
Turkish folk music	17	40	12	36
Turkish art music	15	32	18	35
Pop music	9	57	12	22
Classical western music	5	22	12	61

On examining Table 5, it can be seen that most of the high school students left the paper blank and most could not create a meaningful sentence that included a key concept. The most number of empty sentences were related with classical western music. Ercan and Tasdere (2010) stated that the inability to form a sentence could indicate that the students are not able to create a meaningful sentence including some key concepts as they have not learned these subjects meaningfully at a conceptual level. Moreover, the number of sentences that are unscientific or include superficial knowledge is quite high. These sentences are identified as those that high school students have heard during their daily lives and contain emotions and thoughts rather than any scientific knowledge. Some instances are presented below:

Table 6. Sentences devoted to key concepts

Key Concepts	Sentences with scientific information	Unscientific or with superficial information	Sentences that contain Misconceptions
Turkish folk music	Turkish folk music emerged from the Turkish people and played with instrument like baglama and consists of folk songs, threnody, cultural songs, etc.	Turkish folk music is mostly about love.	Qanon and reed flute are important instruments.
Turkish art music	Pieces that are sang with a certain mode emotionally loaded with instruments such as the oud (lute) and qanon.	Are among the great types of music in Turkey.	In Art music instrument like the piano and harp are widely used.
Pop music	Music genre preferred all around the world by the popular culture.	Pop music makes people feel more energetic and amused.	X
Classical western Music	Are pieces presented with western music instruments and written according to some certain rules.	Classic music belongs to western people.	Music instruments like harmonica and guitar are used and bass from computer could also be added.

In Table 6, some examples of the sentences written by the students are presented. On examining the table, it can be seen that the students wrote sentences that includes scientific information, unscientific information, as well as sentences with conceptual errors related to each music genre. It can be understood that students have all sorts of conceptual errors in their cognitive structures related to various music genres.

4. Conclusion, discussion and further studies

The cognitive structures of the participants regarding the four music genres were determined based on the key-words that they have written after the analysis of the bulk of data obtained. Hence, the words stated in the WAT made for the genre of Turkish Folk Music were clustered in four categories, for Turkish Art Music also in four categories, for Pop Music again in four categories, and Classical Western Music under five different categories. Participating high school students have produced 1,401 words in the WAT made for the four music genres, 101 of them were disregarded, as they were repeated or irrelevant to the topic. The total amount of the words subjected to analysis is 1,300. Words that could not be attributed to any category, but were related somehow to the concept were clustered under the category of 'others'. The underlying reason for the categorisation under heading of 'others' is important since it does indicate their current knowledge structure. The categories obtained and the key words within the categories are sufficient to show in detail the cognitive structure associations of the students for each of the four music genres.

The category that yielded the most number of key- words, 390 in total, is related to the genre of Turkish Folk Music. The least amount of key words, 180 in total, is related to the genre of Classical Western Music. Bahar et al. (2006), have stated that the amount of words associated with a particular concept can be used to see whether it is understood or not and thus understanding a concept is related closely with the words associated.

Accordingly, the conceptual framework of the students contains more and heavily intertwined concepts related to the genre of Turkish Folk Music compared to Classical Western Music. Istanbullu and Vural (2012), stated in the research they have made with the 9th grades living in cities and on the country sides that both preferred traditional music genres (TFM, TAM).

In the 'theoretical knowledge' category of the Turkish Folk Music genre, 'Maqam' between answer words is seen. This situation shows that students identify the maqam with Turkish music. A similar result emerged in the work of Gerekten (2018), it was seen that the pre-service teachers gave Turkish Folk Music answer to the concept of maqam and they evaluated this genre of music as a genre of maqam.

Even though there are views that this is related to the music preference listened to and the impact of culture, it is a fact that this will not be a hindrance for the correct formation of correct concept acquisitions. For instance; even though the students do not listen to Classical Western Music or Turkish Art Music, he should have enough knowledge and correct cognitive structures related to both music genres as stated among the goals of music classes taught. In the present study each word-answer given by the students related to the four music genres was categorised based on their quality and association with the key concepts and the ones that did not fit into any category but were still related to the main key concept and were used more than once clustered under the title of 'others'. This category emerged in all three music genres except Turkish Folk Music. This could be considered as an indicator of the fact that the concept schemas of the participants were similar in the Turkish Folk Music. The most words categorised under the title of 'others' was related to Pop Music. According to Nartgun (2006), the word-answer associated with the key concept can also be an association used as a reminder that has no relation with the key concept at all. In this study, WAT is used only for the purpose of diagnosis of a priori knowledge.

It can be seen that in all four music genres, students had answers related to the categories of of Instrument and Artist. Among these, the Instrument categories (total f:394), even though low, there were some conceptual misunderstandings (total f: 29). Most of the students managed to associate music genres with the instruments correctly in the answers given (f: 365). This shows us the large part of the students have an accurate structure at a cognitive level. Similarly, Kurtaslan (2018), aims to determine the cognitive structure of the concept of note and determined that the category with which students relate most is the instrument category.

In his study Gencoglu (2013), concluded that, even though the educational system is somewhat fruitful for students to gain some knowledge about instruments, when the data obtained was analysed it was quite insufficient. The findings of Gencoglu is contrary to the findings of the present study; yet, his study was made with 6th graders and the current educational system, there are acquisitions in the necessary cognitive area all the way to high school period.

Besides, the answers given by the students in the WAT like 'Cultural' for Turkish Folk Music, 'Rhythmic' for Pop Music and 'Period' for Classical Western Music was appropriate for the formation of categories in 3 out of 4 music genres and futile and reliable method to assess the conceptual structures and obtain detailed information. Among these categories, the highest frequency belongs to category of 'Cultural' in the Turkish Folk Music genre (f:141). This situation shows that the students are associating cultural values with Turkish Folk Music and they are making the right knowledge configuration about cultural concepts in their minds. Other categories are as follows: 'Rhythmic' in Pop Music (f:64.); 'Period' in Classical Western Music (f:11).

Aydiner's study (2015), on teacher candidates use of metaphors related with the traditional music genres had findings in line with the present study. He identified a cultural factor category for Turkish Folk Music and most of the participants in his study were in this category.

In the present study, concepts are associated correctly by the students at key- word level but at a sentential level there were conceptual misunderstandings. This shows us the conceptual structure is not sufficiently built at a cognitive level.

The study made by Ozdemir (2018), showed that the analysis of the sentences created for leisure and recreation concepts, it is seen that the sentences containing emotions and thoughts, which are unscientific or contain superficial knowledge and misconception, are in the majority.

In their study, Kaya and Akis (2015), have also determined in their study on the concept of air of prospective geography teachers meaningful associations made in WAT at word level; however, conceptual errors emerged at sentential level.

According to Ercan and Tasdere (2010), the inability of the students to form meaningful sentences including the key concepts could be considered as a finding indicating that the students were unable to learn these concepts meaningfully at a conceptual level.

Similarly Karakus (2019), at the end of the research, it has been revealed that a notable part of the students are capable of forming sentences which include scientific information over the concepts of natural disasters (earthquake, forest fire, flood, landslide, avalanche, erosion, drought), and don't have a misconception of landslide and avalanche concepts

Therefore, after the identification of the students' misconceptions at the beginning and throughout the lessons, the classes are to be conducted using appropriate teaching methods and techniques. Teaching of concepts has an important function in music classes in which abstract concepts dominate. For this reason curriculum of music classes should be designs as such to include conceptual teaching and enriched with activities to sustain it. Using methods and techniques that enables the correct association of musical concepts and enabling conceptual understanding of these will facilitate process of learning and ensure the long lasting knowledge retention.

The present study has been conducted to determine misconceptions and conceptual associations in the cognitive structure of high school students related to different genres of music. In future studies, WAT could be employed with different sample groups using a pre-posttest experimental research design to determine concept formation and change.

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