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The Effect of Mind Mapping Technique on Students' Achievements in Music Lesson and on Their Attitudes towards the Mind Mapping Technique *

Sibel Çoban [1], Ekin Selçuk Tokatlı [2]

Abstract

The aim of this research is to determine the effect of the mind mapping technique used in music lesson on student's achievements and on their attitudes towards the mind mapping technique.

Research was conducted with a total of thirty-seven students studying in third grade in 2014-2015 academic years in Ümraniye District of Istanbul Private Ümraniye/ Bahçeşehir Elementary School. An experimental and a control group were used in the research. During the implementation of mind mapping techniques in the experimental group, a six-hour lesson plan was prepared on the "Familiar Instruments" subject; then students were informed about the proposed plan and expected achievements from them. In the control group which traditional method was applied, teacher created the lesson plan before entering the course.

With regard to the experiment group, totally six hours of course plan comprised of six individual 1-hour sessions was prepared on the subject of "Familiar Music Instruments"; students were notified about this plan; and acquisitions were tried to be given to the students during application of mind map technique. On the other hand, the conventional method was applied with the control group. Mann Whitney-U Test and Wilcoxon Test were conducted during collection of numerical data.

As a result of the study, it was determined that experiment and control group were displaying homogenous structure; and that a significant difference was determined only with the post-test scores of the participants from the experiment group.

Keywords

Mind mapping technique
Music education
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Success

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[1] Marmara University, Atatürk Faculty of Education, Fine Arts, Turkey, sakinci@marmara.edu.tr
[2] Marmara University, Institute of Educational Sciences, Turkey, ekin.selcuk@hotmail.com

Introduction

Education is considered as a process which constitutes life of an individual, starting from the moment we were born, through which we gain knowledge, skill and behavior as a result of our interaction with surrounding setting. As it was indicated by Çelikkaya (2009), education is a science including the effort to raise and guide new generations along the pre-determined purposes, and technique, to legate science and methods of this guidance and raising. This science is one of the most effective tools allowing individuals to develop their skills and contributing into their socialization. Education aims that individuals gain positive behaviors and increase their productivity as well.

The notes taken from what we read, listen, observe and think are significantly important in recalling what has been learnt. Material, tools and equipment utilized to increase efficiency of teaching support the education process; vitalize the subject by enriching the process so as to improve learning. Used materials contribute into grabbing attention of audience, embodying what seems abstract, saving time and facilitating recalling.

There are numbers of techniques and methods available to be utilized in music courses. It was observed that when music course with extensive scope is lectured through conventional method, students start losing their acquisitions in the course. It was determined that when music course consisting of great deal of foreign references and terms is lectured through the conventional method, these knowledge turn to become transitive. Therefore, practicing techniques such as mind map which facilitate remembering and learning, developing creativeness of students, materializing abstract concepts, grabbing attention and allowing students to work with joy contribute into success of students. As it was suggested by Uluğ (1993), the mind map technique includes internalization of knowledge and thought intended to be used in the future; "taking note" is transfer of them into paper-based environment through symbols and letters; and it is possible to nominate them as one of the most ancient techniques.

In determination of the subject of the present study, the thought that "mind mapping technique that could be used in music courses lectured by means of the conventional methods could make a contribution in comprehension of acquisitions necessitated by the MNE and to improve musical knowledge" were taken into consideration. The problem was determined as "the Effect of Using Mind Mapping Technique in Music Course on Students' Success and towards to the Mind Mapping Technique Attitudes".

According to the literature review conducted within the scope of the study, it was observed that studies on application of mind mapping technique were primarily concentrated on Natural Science, Life Science and Social Sciences, then on Math and Turkish courses. Moreover, other studies concerning English and Geography were also encountered in the literature. Whereas no any research on using mind mapping technique in the music education has been found in the international literature, national literature on this major is limited with Şen's (2012) "*The Effect of Mind Map Technique on Students' Cognitive and Kinetic Skill Development in Violin Lessons Lectured in Fine Arts and Sport High Schools"*. The effect of using mind mapping technique in music course on students' success is important in terms of elucidating their attitude towards the course and whether it differs with respect to variables. It is expected that the study would provide an alternative course model for music courses lectured in primary schools and to be a reference for the future studies.

According to the relevant literature, studies on application of mind map technique have been concentrated on Natural Sciences, Life Sciences, Social Sciences and Math and Turkish Courses. Additionally, various studies concentrated on English and Geography was also determined.

In their study, Peterson and Snyder (1998) gave positive results as students' comprehension of complex problems in a short period of time and realization of subjects on which they need further research and the majors on which they need additional information.

In an empirical study conducted by Amar Singh (2004) in which the mind map and the brain storming methods were applied in combination, students from the experiment group displayed positive results in terms of improving writing skills.

In the study conducted by Farrand, Hussain, and Hennessy (2002) aiming the effect of the mind map method on persistence of written course material in mind, researchers observed an improvement in volume of information recalled by students from the group used mind map method.

In the study of Goodnough and Woods (2002), it was observed that students classified mind maps under four fundamental dimensions of "funny, interesting, motivating and learning tool". Moreover, majority of students (80%) stated that mind maps were facilitating their learning and comprehension of the relevant concepts.

In a theoretical thesis study reported by Chen (2010), the researcher tried to outline how to combine mind map usage and collaborative learning method. In this regard, evaluations were made from the institutional view. Afterwards of the evaluations, it was concluded that supporting mind map usage with collaborative learning could be effective especially on foreign language. Moreover, it was emphasized that this sort of application could be considered as a student-centered and active learning.

In the study of Rahayu and Yoon (2001) conducted on writing activities of students, it was emphasized that motivating students to use thinking maps such as mind map by teachers especially regarding answering of open-end questions.

Negative consequences of application of the mind map method in education could rarely be encountered based on the indirect literature.

Peterson and Snyder (1998) reported a negative dimension of mind map application as the difficulty experienced by students in understanding what was really expected from them through the learning process because they were not acquainted with this approach. Since students were not spending adequate time, they either produced low quality maps or spent great deal of time to create quality maps. Some students experienced anxiety with drawing or using computer.

Whereas no any research on using mind mapping technique in the music education has been found in the international literature, national literature on this major is limited with Şen's (2012) "*The Effect of Mind Map Technique on Students' Cognitive and Kinetic Skill Development in Violin Lessons Lectured in Fine Arts and Sport High Schools"*. The effect of using mind mapping technique in music course on students' success is important in terms of elucidating their attitude towards the course and whether it differs with respect to variables. It is expected that the study would provide an alternative course model for music courses lectured in primary schools and to be a reference for the future studies.

The main problem sentence of this study is to investigate attitudes of students towards mind map technique and the effect of this technique on students' success in music courses.

Sub-Problems

1. What is the effect of the minf map technique on students' success in music course?

2. What is the attitude of students towards mind map technique?

Conceptual Framework

Mind Mapping

Mind map is a thinking strategy and note-taking model developed by Tony Buzan, the British psychologist, mathematician and brain researcher, in the end of 1960s (Karaçalı, 2012). Balım, Aydın, Türkoğuz, Evrekli, and İnel's (2011) cited by Trevino, Buzan was suggesting this technique, he considered full utilization of brain capabilities. Margulies (1991) emphasized that mind mapping was a learning technique based on not only either left or right hemispheres of the brain, instead considering and integrating all functioning processes of them (as cited in Balım et al., 2011). Practor (2012) reported that mind mapping was a note-taking technique.

In recent years, they have been visual tools which came to prominence based on distinctive characteristics such as creativeness, enhancing memorizing, ensuring effective learning and assisting students to reveal preliminary knowledge of students (Evrekli, İnel, & Balım, 2010).

Mind mapping is a technique which presents relationships and concepts together with keywords leading the brain (Ehrlich, 2011 as cited in Balım et al., 2011); and represents and classify the knowledge (Weideman & Kritzinger, 2011 as cited in Balım et al., 2011).

Mind map is used to create, visualize, design and classify thoughts within education, organization, problem solving and decision making processes. It is an illustrative diagram which indicates semantic or other connections among information. In general, diagrams, illustrations, words and lines (Yaşar, 2006).

Mind maps could be utilized in both learning process and in evaluation of learning products. Mind mapping offers students opportunities to structure meaning in both individual and group environments within the classroom (Goodnough & Long, 2012 as cited in Evrekli, İnel, & Balım, 2012).

Additionally, Abi-El-Mona and Adb-El-Khalick (2008) emphasized with regard to multiple intelligence theory that mind maps could be significantly useful in association of visual and verbal intelligence (as cited in Evrekli et al., 2012).

Mind map is one of the best methods which optimizes learning capacities of individuals' and facilitates comprehension of complex structures (Ingemann, 2001 as cited in Gömleksiz & Yetkiner, 2012).

Conventional Note-Taking Method and Mind Maps

The linear note-taking technique utilizes few skills of brain such as word, list, line usage and certain level of analysis capability (Buzan & Keene, 1996 as cited in Karaçalı, 2012). Therefore, individuals using conventional note-taking techniques look like athletes with one arm and one leg, who could only use half of their skills (Ateş, 2009 as cited in Karaçalı, 2012). Expressions associated with note-creation and note-taking are usually boring, punishment, head-ache, loss of time and failure (Buzan & Buzan, 2011 as cited in Karaçalı, 2012).

According to Buzan (2009), disadvantages of the conventional note-taking:

1. It causes waste of time because words which do not require any memorization are recorded.
2. Then, these unnecessary words are read repeatedly and this also causes waste of time.
3. Since they are not put in prominence, significant time is spent to find keywords melted inside.
4. Since connections among keywords are hindered by the words insignificant in terms of the essence of the subject, this result in waste of time. Intervened distances weaken connections among keywords. The greater the distance among these words, the difficult to establish a connection (as cited in Karaçalı, 2012).

According to Buzan and Keene (1996), mind maps offer great advantages with respect to conventional linear note-taking method:

1. Allows us to save time; but you only take note of images related with the main words then read them.
2. Allow us to concentrate on significant subject.
3. Evoke your brain and astounding creativity powers.
4. Enhance our recalling strength (as cited in Karaçalı, 2012).

Structuring Mind Map

Mind maps include color, dimension and images as well as words. It is appropriate to draw them on white papers through a dozen of color marker pen (Buzan & Keene, 1996 as cited in Karaçalı, 2012). A complex mind map created without consideration does not carry desired summary feature. Well-structured mind map is creative thinking mechanism. Yet, it allows establishing association among creativity, imagination and opinion (Karaçalı, 2012).

According to Gömleksiz and Yetkiner (2012), certain rules apply to structuring a mind map among visual tools;

• Structuring of mind map commences with having a blank paper.
• Main subject is placed in the center of the paper.
• Starting from the main subject, sub-branches are structured. Branches from the main subject are marked bold. Secondary branches indicating sub-opinions are indicated with thin lines.
• While branches are structured, it is necessary to pay utmost attention to use different colors.
• This situation facilitates associating opinions.
• While branches are structured, words are indicated on them.
• Figures are placed. Figures which could be replaced with words are created. Figures and drawing would significantly consolidate learning.
• Arrows are placed in a way that they indicate the relationship among branches and figures.
• The map is structured with capital letters.
• Repeating is not a problem in structuring of a map. Then, they could be associations.

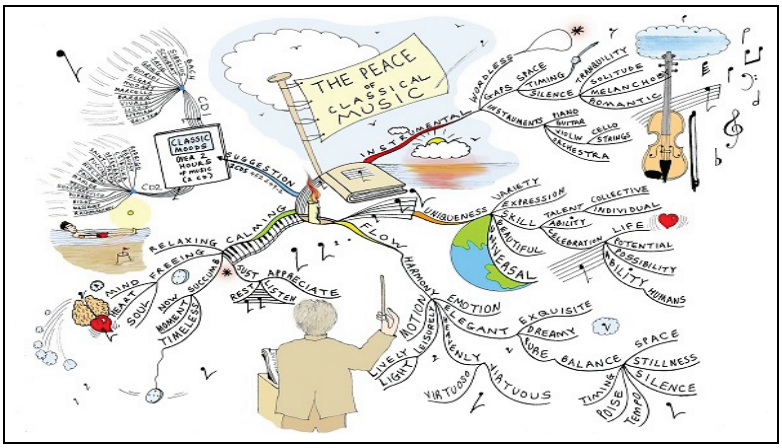

Figure 1. Mind Mapping (Foreman, 2011)

In structuring of a mind map, there are other ways than the one suggested above. Whatever the applied drawing method is, the important thing is to draw the map with appropriate consideration and in a comprehensible way. Poorly prepared, complex mind map would prevent creation of desired learning level (Caine & Caine, 2002 as cited in Korukcu, 2007).

Method

Research Model

This research is an empirical model. Empirical models are the research models in which data needed to be observed are generated directly under control of the researcher to determine causality relationships (Karasar, 2007).

In the present research, in order to determine the effect of the usage of mind mapping technique in the "Familiar Instruments" unit of music course curriculum on student success and attitudes, an empirical study was conducted appropriate to the "Pre- and Post-Test Model with Control Group". In this test design, there were randomly selected two groups; one of whom was referred as experiment and the other was control group (Karasar, 2007).

Whereas the independent variable of this study was mind map technique, the dependent variable was student success.

Working Group

The study group was consisted of 37 students attending to the 3rd grade in a private education institution located in the Ümraniye County in the 2014-2015 Academic Year. The study groups were randomly selected. Whereas 56.8% of respondents were in the experiment group (21 subjects), 43.2%were in the control group (16 subject).

Collection of Data

Study data was collected by applying mind map technique to the experiment group and the conventional teaching was applied to the control group. In the pre- and post-test periods, subjects were asked to fill in personal information form; information test regarding music course; and attitude scale for mind map technique used in the music courses.

In order to determine attitude of the experiment group towards the mind map technique, "Attitude Scale Towards Mind Mapping Technique Used in Math Course" developed by Gür and Bütüner (2006) was adapted to the music course by the researcher; then its scope and validity were investigated. The reliability coefficient was estimated as 0.938; the score interval was determined as 16-80. The suggested scale was consulted to the experts; and the relevant reliability coefficient was determined as 0.71.Five-point Likert Scale was utilized in evaluation of respondents' answers from" certainly agree", "agree", "not sure", "disagree" and "certainly disagree". The scale was consisted of 16 items; whereas 10 were including positive, 6 were negative expressions.

Music knowledge test was prepared to measure music course success of students. This test was consisted of 20 multiple-choice items measuring basic music knowledge taught during the experiment. Whereas the reliability of the test was evaluated based on the expert consulting, it was applied to all 3rd grader students (N=37).

Application of Mind Mapping Technique

In the practice stage of the mind mapping technique, a six-hour course plan on "Familiar Instruments" subject was prepared to be instructed in six different course session. The respondent students were informed about the course plan and acquisitions. Students in the experiment group were separated in four different groups randomly. In order to establish the balance of these groups, females and males were selected separately.

In the first application week, personal information of students, their music knowledge level and their attitude towards mind map technique were collected through the pre-test application.

In the second week, mind map technique was introduced; and examples from former structured maps were presented. Students were also informed about the materials necessary for structuring a mind map; and noticed that they will progress to the application stage in their next course.

In the third week, students were informed about the "Familiar Instruments" subject. Violin, kemancha, flute and Ney were determined as the instruments that would be applied in the mind map method. While these instruments were being considered, especially two wind and two string instruments were selected. It was also paid attention to that while one of these pairs from classical Turkish instrument, the other was among the instruments used in international orchestras. Application stage of the mind map technique was initiated with this subject. In the fourth and fifth weeks, application of the mind map technique continued.

In the sixth week, the post-test study was conducted so that it could be revealed that whether there was statistically significant difference among students' music knowledge levels and their attitudes towards the mind map technique.

As the courses were instructed along the designated plans, students attended to these courses by preparing beforehand. Students in the groups prepared mind maps in cooperation with other students in their group. Students tried to see and understand the subject on their mind maps as a whole.

Figure 2. Examples of Mind Maps Prepared by Students

Application of the Conventional Method

In the application of the conventional method, the teacher constructed the course plan before the each course. Besides the instructing technique, question and answer technique was also utilized. After each course, the subject was generally covered; and a brief reminder was given before each course about the previous course.

Data Analysis

The Mann Whitney-U Test was conducted in the present study in order to determine whether pre- and post-test success and attitude scores of students significantly differ with respect to the group variables. Then, Wilcoxon Test was conducted in order to determine whether there was difference between success test and attitude scale pre- and post-test scores between the control and experiment groups. Graphics of the obtained findings were exhibited in the Findings and Discussion section

Findings and Comments

Findings Regarding the Effect of Mind Mapping Technique on Students' Success In Music Course

Table 1. Mann Whitney-U Test Results Conducted to Determine Whether Success Pre-Test Scores Differ with Respect to the Group Variable (EPoT2-CPoT2)

Pre-Test Score	Groups	*N*	Mean Rank	Sum of Ranks	*U*	*z*	*P*
Success	Experiment	21	21,60	453,50	113,500	-1,685	,095
	Control	16	15,59	249,50			

As a result of the Mann Whitney-U Test conducted to determine whether success pre-test scores of respondents with respect to the group variable, no any statistically significant difference was determined with mean scores of respondents. This situation suggests that both group exhibit similar results before the study, which is expected and desired situation in empirical studies.

Table 2. Mann Whitney-U Test Results Conducted to Determine Whether Success Post-Test Scores Differ with Respect to the Group Variable (EPT1-CPT1)

Post-Test Score	Groups	*N*	Mean Rank	Sum of Ranks	*U*	*z*	*P*
Success	Experiment	21	25,93	544,50	22,500	-4,479	,000**
	Control	16	9,91	158,50			

According to Table 2, as a result of the Mann Whitney-U Test conducted to determine whether success post-test scores of respondent students differs with respect to the group variables, it was determined that the difference among mean scores of students was found statistically significant with respect to students' success scores. In the experiment and control groups whose pre-test means scores were found close to each other, it was observed that students from the control group failed to retain their acquisitions which they learnt along the process; on the other hand, students from the experiment group succeeded to retain the information given and their success levels increased.

Table 3. Results of the Wilcoxon Analysis Conducted to Determine Whether There was Significant Difference Among the Pre-Test and Post-Test Mean Success Scores of Students From the Experiment Group (EPPoT1-EPPoT2)

Score	Groups	*N*	$\bar{x}_{sira}$	$\sum_{sira}$	*z*	*P*
Success	Decreasing	0(a)	,00	,00	-4,025	,000**
	Raised	21(b)	11,00	231,00		
	Equal	0(c)				
	Total	21				

As a result of the Wilcoxon Test conducted to determine whether there was significant difference among the pre- and post-test mean scores of students from the experiment group, it was determined that increased success levels of students from the experiment group were found significant. Additionally, it was observed that students were active in all courses along the whole process, their social relationships have developed in the group, their sharing and responsibility senses developed and followed a careful studying path. As a result of the studies conducted, it was determined that students have gained and comprehended much more acquisitions and knowledge determined by the MNE.

Table 4. Results of the Wilcoxon Analysis Conducted to Determine Whether There was Significant Difference Among the Pre-Test and Post-Test Mean Success Scores of Students From the Control Group (CPPoT1- CPPoT2)

Score	Groups	*N*	$\bar{x}_{sira}$	$\sum_{sira}$	*z*	*P*
Success	Decreasing	2(a)	4,00	8,00	-1,809	,070
	Raised	7(b)	5,29	37,00		
	Equal	7(c)				
	Total	16				

According to the Table 4, the results of the Wilcoxon Test conducted to determine the difference between pre- and post-test scores of students from the control group showed that the increase in the success scores of students from the control group was not significant. In the course content with teacher-centered structure, in which usually plain lecturing is preferred, it was observed that attention of students were lost along the course; and their participation into the course decreased. Although a general recovery was after made after each course; and a reminder of the previous recovery was made before each course, it was observed that proportion of the students who answered the questions correctly were in minority.

Findings Regarding Students' Attitude towards the Mind Mapping Technique

Table 5. Results of the Mann Whitney-U Test Conducted to Determine Whether Attitude Pre-Test Scores Differ with Respect to the Group Variables (EP1-CP1)

Pre-Test Score	Groups	*N*	Mean Rank	Sum of Ranks	*U*	*z*	*P*
Attitude	Experiment	21	19,17	402,50	164,500	-1,742	,083
	Control	16	18,78	300,50			

As a result of the Mann Whitney-U Test conducted to determine whether attitude pre-test scores of respondent students differs with respect to group variables, the difference among mean attitude scores of respondent students was not found statistically significant. This situation suggests that both groups were having similar characteristics in the re-test period, an expected and desired situation in empirical researches.

Table 6. Results of the Mann Whitney-U Test Conducted to Determine Whether Attitude Post-Test Scores Differ with Respect to the Group Variables (EPo2-CPo2)

Son Test Score	Groups	*N*	Mean Rank	Sum of Ranks	*U*	*z*	*P*
Attitude	Experiment	21	21,69	455,50	111,500	-1,742	,083
	Control	16	15,47	247,50			

As a result of the Mann Whitney-U Test conducted to determine whether attitude post-test scores of respondent students differ with respect to the group variable, the difference between attitude scores of respondent students was not found statistically significant. These results indicate that alternative method was not found significant difference between attitude scores of groups.

Table 7. Results of the Wilcoxon Analysis Conducted on the Experiment Group to Determine Whether There is Difference Between Attitude Scale Pre-Test and Post-Test Scores (EP1-EPo2)

Score	Groups	*N*	$\bar{x}_{sira}$	$\sum_{sira}$	*z*	*P*
Attitude	Decreasing	4(d)	9,25	37,00	-2,346	,019*
	Raised	15(e)	10,20	153,00		
	Equal	2(f)				
	Total	21				

As a result of the Wilcoxon Test conducted on the students from the experiment group to determine the difference between their attitude pre-test and post-test scores, the increase in the attitude scores of students from the experiment group was found significant. It was also observed that students realized what they learnt along the process; they worked in collaboration with their friends; and they were continuously active along the course, which made the course more fun for them. All these were considered as positive effect on their attitudes.

Table 8. Results of the Wilcoxon Analysis Conducted on the Control Group to Determine Whether There is Difference Between Attitude Scale Pre-Test and Post-Test Scores (CP1-CPo2)

Score	Groups	*N*	$\overline{x}_{sira}$	$\sum_{sira}$	*z*	*P*
Attitude	Decreasing	8(d)	5,75	46,00	-1,911	,056
	Raised	2(e)	4,50	9,00		
	Equal	6(f)				
	Total	16				

As a result of the Wilcoxon Test conducted to determine the difference between attitude pre-test and post-test scores of students from the control group, the increase observed in the attitude scores of students from the control group was not found significant. These results suggested that applied conventional method did not yield significant difference in success and attitudes of students from the control group.

Discussion, Result and Suggestions

Discussion and Result

The present study is considered as the precursor of the ones on the mind mapping technique applied in music education at schools in Turkey; and it is expected to lead other new studies in which aforesaid method utilized and to make significant contribution into the music education and especially pedagogy and school music education field; and therefore it is considered valuable study. As a teaching technique, it was employed in music education so that students' success in music course and their attitude toward music course could be investigated. Unfortunately, there are only limited studies on music education area in the international literature. Thus, it was found necessary to discuss positive and negative dimensions of this applied teaching technique.

It was observed in the study that although the experiment and control groups whose pre-test scores were close to each other; students from the control group lost their knowledge and acquisitions in the process; and the students from the experiment group maintained their acquisitions fresh and their success has developed.

According to the success pre-test and post-test results of the students from the experiment group, a significant increase was determined with the success scores of the students from the experiment group. Additionally, it was observed that students participated in the course actively along the process; their social relationships have strengthened along the group application; they developed sharing and responsibility sense; and they followed a careful effort. As a result of the conducted studies, it was also determined that they accomplished much more comprehension than the one determined by the MNE.

When the difference between attitude pre-test and post-test scores of students from the experiment group were taken into consideration, the increase in the students' attitude scores were found significant. It was also observed that students realized what they learnt along the process; they work in collaboration with their friends; and they were continuously active along the course, which made the course more fun for them.

Finally, the present study proved that mind mapping technique could be an appropriate alternative teaching technique in music education area like all other areas. It was observed that upon introduction of the constructivist approach in instruction of all courses after 2006 in primary education, it could especially be an alternative teaching method in music courses based on the findings of the present study. This study could be valuable for such contribution into the current literature.

Suggestions

- Based on the results of the present study, teachers are required to be informed about and encouraged to use the mind map technique in teaching process in terms of its practicability in music course and its positive influence on student success; students are required to be attracted to the courses through this technique.
- Since evaluation tools consisted of conventional questions or multiple choice questions do not supply sufficient feedback, this method could not only be a teaching tool, but also a measurement tool.
- Instead of conventional homework, mind map homework through which students could develop their creativities and could be repeated.
- Mind map technique could be included in music education, music teaching departments of universities, and program contents of courses such as "Teaching Principles and Methods", "Teaching Technologies and Material Design" and "Special Teaching Methods".
- This study conducted on "Familiar Instruments" subject in the music course could also be conducted on different subjects.
- In order to ensure memorization of information, mind maps could be structured for each unit in the music course similar to all other courses because the more attractive mind maps, the more persistent of the information.
- Individual studies could be conducted to investigate its impact on success apart from group studies.
- In this study, hand drawn mind maps were studies. In various studies, computer-aided mind map studies could be used in both music education field and in all other areas..

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