The Relationship Between Thinking Styles and Learning Strategies of Students Studying in the Field of Music

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Abstract

This research aims to reveal the relationship between the thinking styles and strategies used while studying and learning instrumental music in the music departments of the faculty of fine arts and Turkish state music conservatories. The study utilized a correlational design among quantitative research designs and simple random sampling among sampling methods (n=137). The normal distribution of the data was evaluated using histograms, Q-Q plots, and the Shapiro-Wilk test. The correlation between quantitative data was assessed using Pearson correlation analysis. There was no significant difference between the mean values of the sub-dimensions of the scales used in this research and the class variable (p>0.05). In the study, a significant difference was found in favor of males between the gender variable and only the 'executive' sub-dimension of the learning styles scale (p<0.05). There was no significant difference between the gender variable and the sub-dimensions of the scale of strategies used while studying and learning instrumental music. The results of this research indicate that students predominantly prefer comprehension monitoring strategies and least like articulation-organization and attention strategies used while studying and learning instrumental music. According to the average values of the study, it was revealed that the most common thinking styles of the participants were hierarchical, judicial, internal, and monarchic; they used liberal, external, anarchic, and oligarchic thinking styles at least, respectively. The data obtained from this research reveals that students do not use enough strategies while studying and learning instrumental music, regardless of their thinking styles. In this case, students should be informed about the use of learning strategies and encouraged to use them. For the teachers to make these referrals, they must be knowledgeable, equipped, and good observers. Pedagogical lessons can be added to the curriculum, including thinking styles and learning strategies, or course contents can be organized to include them.

Keywords: Music, Music Education, Thinking Style, Instrument Practice Strategy, Instrument Learning Strategy

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Müzik Alanında Öğrenim Gören Öğrencilerin Düşünme Stilleri ile Öğrenme Stratejileri Arasındaki İlişki

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Öz

Bu araştırma ile güzel sanatlar fakültelerinin müzik bölümlerinde ve Türk müziği devlet konservatuvarlarında öğrenim gören öğrencilerin düşünme stilleri ile enstrümantal müziği çalışırken ve öğrenirken kullandıkları stratejiler arasındaki ilişkinin ortaya çıkarılması amaçlanmaktadır. Araştırmada nicel araştırma desenlerinden ilişkisel (korelasyonel) desen, örneklem yöntemlerinden ise basit seçkisiz örnekleme yöntemi kullanılmıştır (*n*=137). Verilerin normal dağılıma uygunluğu Histogram, Q-Q grafikleri ve Shapiro-wilk testi ile değerlendirilmiştir. Nicel veriler arasındaki ilişki ise Pearson korelasyon analizi ile değerlendirilmiştir. Bu araştırmada kullanılan ölçeklerin alt boyutlarına ilişkin ortalama değerler ile sınıf değişkeni arasında anlamlı bir farklılık bulunmamıştır (*p*>0.05). Araştırmada cinsiyet değişkeni ile öğrenme stilleri ölçeğinin sadece 'yürütücü' alt boyutu arasında erkekler lehine anlamlı bir farklılık bulunmuştur (*p*<0.05). Cinsiyet değişkeni ile öğrencilerin enstrümantal müziği çalışırken ve öğrenirken kullanılan stratejiler ölçeğinin alt boyutları arasında ise anlamlı bir farklılık bulunmamıştır. Bu araştırmanın sonucunda öğrencilerin enstrümantal müziği çalışırken ve öğrenirken kullanılan strateji türlerinden en fazla anlamayı izleme stratejilerini, en az ise eklemleme-örgütleme ve dikkat stratejilerini kullanmayı tercih ettikleri tespit edilmiştir. Çalışmanın ortalama değerlerine göre katılımcıların sırasıyla en çok hiyerarşik, yargı yapıcı, içe dönük, monarşik düşünme stillerini, en az ise sırasıyla liberal, dışa dönük, anarşik ve oligarşik düşünme stillerini kullandıkları ortaya çıkmıştır. Bu araştırmadan elde edilen veriler, öğrencilerin düşünme stilleri fark etmeksizin enstrümantal müziği çalışırken ve öğrenirken yeterince strateji kullanmadıklarını ortaya koymaktadır. Bu durumda öğrenciler, öğrenme stratejilerinin kullanımı hakkında bilgilendirilmeli ve onları kullanmaya teşvik edilmelidir. Öğreticilerin de bu yönlendirmeleri yapabilmeleri için bu konuda bilgili, donanımlı ve iyi bir gözlemci olmaları gerekmektedir. Buna ek olarak ders müfredatlarına düşünme stillerinin ve öğrenme stratejilerinin kullanılabileceği pedagojik derslerin eklenmesinin veya ders içeriklerinin bunları içerecek şekilde düzenlenmesinin yararlı olacağı düşünülmektedir.

Anahtar Kelimeler: Müzik, Müzik Eğitimi, Düşünme Stili, Enstrüman Çalışma Stratejisi, Enstrüman Öğrenme Stratejisi

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1. Introduction

It is thought that some practices that will enable the individual to know himself, such as identifying thinking styles in music education and training and applying appropriate learning strategies, do not find enough space in the curricula of music departments and conservatories in Turkey. Only through art education can an individual be able to establish relationships that he or she could not establish before, to put forward new ideas and products, and to create a new thought network on the concept or concepts that he or she thinks about. Thanks to art education, the needs of different areas of expertise, their positive relationships, and interactions with each other can offer new solutions (Aycan 2017). For this reason, it is important to apply tests (thinking styles, learning strategies tests, etc.) that will enable students studying art to interact with the field of educational sciences and to get to know themselves individually.

1.1. Thinking Styles

Although different concepts such as learning styles, cognitive styles, and thinking styles are encountered in the literature under the name of style, they are not skills themselves (Zhang, 2002). Thinking styles are preferences in using skills rather than skills on their own. Individuals have a style profile rather than a single style. Styles can vary and diversify throughout life, depending on the situation and conditions. Individuals differ in terms of the flexibility and power of their thinking styles. A style preferred by an individual at one point may give way to another style that is functional and valuable. Styles themselves are not inherently good or bad. They are acquired through socialization processes (Sternberg & Grigorenko, 1997).

Thinking processes are acquired through individuals' interactions with their environment in the learning and socialization processes. The cultural background, parental attitudes, child-rearing methods, and dominant thinking styles in society affect the formation of thinking styles (Duru, 2004). Therefore, thinking styles can change, diversify, or undergo changes throughout life. For example, thinking styles such as judicial and legislative may not be used functionally in the early stages of life. Still, they can be effectively used in later stages of cognitive development. While a student may use the legislative thinking style with a desire to learn new things in physics lessons, the same student may use the liberal style while playing games and the executive learning style related to personal tasks at home. Therefore, flexibility can be mentioned when using thinking styles (Sternberg & Grigorenko, 1997).

Çubukçu (2004) defines thinking styles as the preferred ways individuals use their abilities. It has also been stated that students' thinking styles are closely related to their age, gender, hobbies, leadership experiences, and work experiences. Revealing and developing thinking styles that are effective in creative thinking, decision-making, problem-solving, evaluation, and reasoning is crucial for developing an individual's cognitive structure (Çubukçu, 2004). Furthermore, thinking styles contribute to individualized academic achievement based on individual abilities in the learning-teaching environment while helping individuals recognize their learning styles.

Sternberg (1997) extensively analyzed the styles in the literature and classified them into five dimensions and 13 thinking styles. These dimensions are functions (legislative, executive, judicial), forms (hierarchical, oligarchic, monarchic, anarchic), levels (global

and local), scopes (internal and external), and leanings (liberal and conservative). This classification was also the basis of this research.

Dewey (1933) argued that times change, people change, everything changes and if you are not a reflective people can't change with them. And if you don't change you won't be effective. You have to be ready and willing to adapt to these changes. Dewey explains the qualities that an individual must have for reflection to occur as open-mindedness, full willingness and responsibility (Kotzee 2018). Open-mindedness is the ability to look at the problem from different and new perspectives. Being open-minded requires being an active listener, being ready to listen to others, and understanding that their beliefs may be wrong (Priest 2021).

Being an active listener can be acquired through training in the ability to listen to others and to look at problems from different perspectives in order to understand that their beliefs may be wrong. Art education involves both psychological and pedagogical skills. While communication skills are effective for the transfer of technical knowledge, personality, attitude towards work, personal passions, degree of development of artistic taste and cultural background should be analyzed. In this way, individuals can build their skills on a solid foundation. Teaching techniques, how to organize information, ways of communication, making use of mistakes in the search for solutions, making use of practical knowledge, reinforcing known theoretical elements, can enable the individual to formulate ways that lead to personal observations. This is summarized in the figure below (Calefariu 2020).

Figure 1. A selection of a lyric artist's skills(Calefariu 2020)

1.2. Thinking Styles of Music Students

There are studies in the literature that examine thinking styles in music research. Some studies focus on the thinking styles of students who receive professional music education, considering various variables (Akçay, 2018; Aycan, 2021; Yılmaz & Didem, 2020). For example, in his preliminary study, Akçay (2018) aimed to determine the thinking styles of music teachers and examine the situation of these styles about various variables. The study involved 151 music teachers. The data for the research were

collected using the Thinking Styles Inventory developed by Sternberg and Wagner (1991) and adapted to Turkish validity and reliability by Fer (2005), as well as a personal information form prepared by the researcher. The study concluded that the participating music teachers generally possessed legislative, executive, judicial, hierarchical, external, and liberal thinking styles, except for age, experience, and individual instrument variables.

Yılmaz and Didem (2020), on the other hand, aimed to determine the thinking styles of students studying music education and art education and examine whether there were significant differences in thinking styles based on various variables. The study included 146 students. The research data were collected using the Thinking Styles Scale developed by Sternberg and Wagner (1992), validated in Turkish by Buluş (2006), and a personal information form prepared by the researchers to determine the students' demographic characteristics. The study found that the participating students preferred legislative, liberal, and judicial thinking styles the most, while conservative, global, and monarchic ones preferred the least. Additionally, it was found that judicial and anarchic styles were more prevalent among second-grade students compared to third and fourth-grade students. Furthermore, there are studies in the literature that examine the relationship between thinking and learning styles and students' achievements in the fields of fine arts and music education (Altun, 2015; Altun, Yurga, Zahal, & Gurpinar, 2015).

Given the mentioned studies, instruction should be planned, considering thinking styles. Therefore, teachers must realize that instruction and assessment should be compatible with students' thinking styles if they genuinely want to show their students what and how they can do (Sternberg, Grigorenko, & Zhang, 2008, p.504). Thus, to reach and fully engage with a student, a teacher must provide flexibility in the instructional plan according to different thinking styles (Özer & Yılmaz, 2016). Table 1 offers instructional methods that can be applied to achieve this flexibility, aligned with varying thinking styles. Additionally, Table 2 presents assessment methods for thinking styles.

Table 1. Teaching Methods Compatible with Thinking Styles

Form of Assesment	Main Skills	Most Compatible Style(s)
Short answers/Multiple Choice	Memory	Executive/Local
	Analysis	Judicial/Local
	Time allocation	Hierarchical
	Working by self	Internal
Essay	Memory	Executive/Local
	Macroanalysis	Judicial/Global
	Microanalysis	Judicial/Local
	Creativity	Legislative
	Organization	Hierarchical
	Time allocation	Hierarchical
	Acceptance of teacher viewpoint	Conservative
	Working by self	Internal
Project/Portfolio	Analysis	Judicial
	Creativity	Legislative
	Teamwork	External
	Working by self	Internal
	Organization	Hierarchical
	High commitment	Monarchic

Note. Adapted from "Styles of Thinking as a Basis of Differentiated Instruction"(Sternberg & Zhang, 2005).

Table 2. Evaluation Methods of Thinking Styles

Thinking Styles Instructional/ Valuational Assignments		
Style Empahized		
Executive	Judicial	Legislative
Who said?	Compare and contrast…	Create…
Summarize	Analyze…	Invent…
Who did?	Evaluate…	If you were…
When did?	In your judgment…	Imagine…
What did?	Why did?	Design…
How did?	What caused?	How would?
Repeat back….	What is assumed by?	Suppose…
Describe….	Critique…	Ideally?

Note. Adapted from "Styles of Thinking as a Basis of Differentiated Instruction"(Sternberg & Zhang, 2005).

1.3. Learning Strategies

Learning strategies are defined as the processes, techniques, or principles that students use to learn a subject or content independently. Gagne and Driscoll (1988) define learning strategies as behaviors and thoughts that are intended to influence the encoding process of information by students (Sünbül, 2011; Weinstein & Mayer, 1983). In the literature, learning strategies are also defined as approaches adopted by students to achieve their learning goals (Yılmaz & Sünbül, 2004). Based on the given definitions, learning strategies can be broadly defined as approaches or exhibited attitudes adopted to facilitate the learning process.

The uniqueness of each individual and the individual differences created by this create differences in thinking styles, learning styles and, accordingly, in the determination of learning strategies. Saga, Qamar and Trali (2015) divided learning styles into three: Visual Learners, Auditory Learners and Kinesthetic Learners, and argued that in order to determine learning strategies, it is necessary to first reveal the learning styles of the students. Yesilyurt (2021) stated that each student may prefer to use different types of learning strategies due to their individual differences, and that the success of students who use learning strategies that are suitable for them will increase. Based on what has been stated, it can be said that individual differences are important in determining learning strategies.

1.4. Music student's learning strategies

There have been numerous studies in the literature focusing on learning strategies in the field of music. Some studies have examined the use and levels of learning strategies among undergraduate students studying music education (Akın, 2013b; Deniz, 2015), while others have explored the use of strategy about various variables (Afacan, 2018; Aycan, 2018; Aydıner Uygun & Kılınçer, 2012a, 2012b, 2017b; Aydıner Uygun & Kılınçer, 2018a; Bircan, 2018; Nacaroğlu, 2019). Some studies aim to identify or evaluate learning strategies used in the performance or education of various musical instruments (Akın, 2007; Avcı Akbel, 2018a, 2018b; Aydıner Uygun & Kılınçer, 2017b; Ertem, 2003, 2014; Geiersbach, 2000; Hanberry, 2004; Kandemir & Yokuş, 2020; Kurtuldu, 2007), and studies that develop scale of strategies used while studying and learning instrumental music (Aydıner Uygun & Kılınçer, 2017a; Kılınçer & Aydıner Uygun, 2013). Additionally, some studies examine the impact of learning strategies on success (Akın,

2013a; Aydıner Uygun & Kılınçer, 2012a; Cangro, 2004; Kurtuldu, 2011; Şahin & Çakar, 2011; Yokuş, 2010), and document analysis studies on learning strategies in music education (Afacan, 2018; Avcı Akbel, 2019). Some of these studies are summarized in detail below.

In a case study titled "Learning Strategies Used by Conservatory Students in Learning Turkish Music Modes," Avcı Akbel (2018a) divided 9 participants into three groups based on their levels. It was found that beginner and intermediate students attempted to understand mode theory by making calculations, studying related modes, listening to compositions, and asking those who already knew about them. Additionally, none of the beginner-level students tried to engage in practice; instead, they primarily learned through listening and utilized rehearsal and articulation-organization strategies. Intermediate-level students, on the other hand, used rehearsal, elaboration, and articulation-organization strategies. Advanced-level students followed a process of memorizing mode sequences and vocalizing the lines before starting to work on them. Therefore, it was revealed that advanced-level students used attention and elaboration strategies in learning modes.

Akın (2013b) found in his study on music teacher candidates' use of learning strategies that the use of deep cognitive strategies had a positive effect on academic achievement. It was suggested that individuals with good musical intelligence had their study activities and academic achievements supported by a deep mental approach. Therefore, to determine the use of cognitive processes in individuals with good musical intelligence, it is recommended to adapt or develop a new scale.

Aydıner Uygun and Kılınçer (2018a) examined the levels of SSLIM (scale of strategies used while studying and learning instrumental music) among 273 student participants studying music education at four different universities. The study revealed that students used rehearsal strategies at the highest level and articulation-organization strategies at the lowest.

1.5. The Relationship Between Thinking and Learning Strategies

The question of whether there is a relationship between thinking styles and learning strategies in students studying music has been investigated in this study, considering the potential benefits of music education. Various strategies are utilized to enhance performance in music education, such as organizing practice schedules, mental practice through visualization, etc (Akın, 2007; Avcı Akbel, 2018a, 2018b; Aydıner Uygun & Kılınçer, 2017b; Ertem, 2003, 2014; Geiersbach, 2000; Hanberry, 2004; Kandemir & Yokuş, 2020; Kurtuldu, 2007). Additionally, numerous research studies have demonstrated the influence of students' thinking styles on learning in music education (Akçay, 2018; Aycan, 2021; Yılmaz & Didem, 2020). Çelik (2016) emphasized that it is important for the individual to use the appropriate thinking style in obtaining knowledge and determining appropriate learning strategies. Therefore, this study aimed to investigate whether there is a relationship between thinking styles and learning strategies in music students.

The importance of research

This research differs from other studies in that it examines the relationship between learning strategies and thinking styles. Determining students' thinking styles is

important in terms of increasing success in education, ensuring effective learning, and contributing to the development of student's abilities such as creative thinking, decision-making, and problem-solving (Çubukçu, 2004). Correct and appropriate use of learning strategies can ensure that the goals set in teaching are achieved in a shorter time and learning is carried out more successfully (Kılınçer & Aydıner Uygun, 2020). Sternberg and Grigorenko (1997) state that thinking styles may be subject to changes and differences throughout life. Therefore, it is extremely important for music students, for whom creativity and flexible thinking are extremely important, to know their thinking styles and be able to choose appropriate learning strategies (Çelik, 2016; Aydıner Uygun & Kılınçer, 2017b; Aydıner Uygun & Kılınçer, 2018b; Çelik & Kumral, 2016). This study is expected to be guided to raise awareness about identifying thinking styles and using appropriate learning strategies.

1.6. The Aim of The Research

This study aims to reveal the direction and magnitude of the relationship between the thinking styles and learning strategies of students in the Fine Arts Faculty (GSF) music department and the Turkish music conservatory. In line with this purpose, the question;

a) What is the relationship between the thinking styles and learning strategies of the GSF music department and Turkish music conservatory students?

b) Are the study strategies of the GSF music department and Turkish music conservatory students different according to gender?

c) Are the learning styles of the GSF music department and Turkish music conservatory students different according to gender?

d) Do the study strategies of the GSF music department and Turkish music conservatory students differ between classes?

e) Do the learning styles of the GSF music department and Turkish music conservatory students differ between classes?

"What is the relationship between the thinking styles of students in the GSF music department and the Turkish music conservatory and the strategies they use when learning and practicing instrumental music?" is being investigated. Additionally, differences in thinking styles and learning strategies are examined based on gender and class variables.

2. Method

2.1. Research Design

In this study, a quantitative research design of a correlational pattern was used. In this context, the relationship between thinking styles and learning strategies of students studying in the field of music was attempted to be determined. In the correlational design, two or more variables are examined to determine the presence and degree of co-variation among them (Karasar, 2007, p.81). In other words, in the correlational design, the existence of a relationship between two or more dimensions of a situation is explored (Kumar, 2018, p.10).

2.2. Research Group

The population of this study consists of the faculties of fine arts and Turkish Music conservatories in the Central Anatolia region. The sample of this study consists of the students of Erciyes University Faculty of Fine Arts, Department of Music, and Ankara Yıldırım Beyazıt University Turkish Music State Conservatory. The number of people to be sampled was determined as 94 individuals with alpha = 0.05, power = 0.95, and effect size value of 0.690, and 160 people were studied. The power analysis of the study was calculated in the G*Power 3.1.9.4 program. Of the 160 individuals who completed the scales in this study, individuals who marked a single value in the scale items and did not complete the majority of the items were excluded. The data of 137 participants were used in the study. A simple random sampling method was used in sample selection. Simple random sampling method is a method in which each sample has an equal probability of being selected (Büyüköztürk et al., 2008). Descriptive statistical information about the SSLIM scale and thinking styles test scale for the sample is given in Table 3 in the findings section. Before starting the study, a pilot study was conducted with 20 people to determine the problems that may occur while applying the tests. The study was directed according to the data obtained from the pilot study. The study was completed in the spring semester of the 2021-2022 academic year.

2.3. Data Collection Tools

2.3.1. The Thinking Styles Test

The thinking styles test developed by Sternberg and Wagner (1991) and validated in Turkish by Buluş (2006) was used to determine participants' thinking styles. The thinking styles test developed by Sternberg and colleagues a 7-point Likert scale; consisting of 65 items, 5 dimensions, and 13 sub-dimensions (Sternberg, 1988; Sternberg, 1997; Sternberg & Grigorenko, 1997; Sternberg & Wagner, 1991). The five dimensions are functions, forms, levels, scopes, and leanings, while the 13 sub-dimensions include local, monarchic, external, anarchic, judicial, oligarchic, hierarchical, internal, legislative, liberal, executive, conservative, and global. Within the dimension of the function, the sub-dimensions are legislative, administrative, and judicial thinking styles.

The legislative thinking style involves individuals who engage in tasks requiring creative strategies and can establish their own rules. Individuals with an executive thinking style work in jobs that involve guidance and adhere to regulations. Those with a judicial thinking style prefer working on tasks that require analysis and evaluation. Within the dimension of the form, the sub-dimensions are monarchic, hierarchical, oligarchic, and anarchic thinking styles. Monarchic thinking style includes individuals who prefer focusing on a single task and have a determined and perfectionist nature. In the hierarchical thinking style, individuals allocate their attention to multiple tasks and work by determining their priorities. In the oligarchic thinking style, individuals attempt to handle multiple tasks simultaneously. Those with an anarchic thinking style prefer flexible and relaxed jobs and must be more systematic. Within the dimension of the level, the sub-dimensions are local and global thinking styles. Individuals with a local thinking style prefer focusing on details in their work. Those with a worldwide thinking style pay attention to theoretical ideas and the entirety of a concept. Within the scope dimension, the sub-dimensions are internal and external thinking styles. Individuals with an internal thinking style tend to work independently, while those

with an external thinking style are inclined to work collaboratively. Within the leanings dimension, the sub-dimensions are liberal and conservative thinking styles. Conservative individuals prefer to adhere to existing rules and resist change, while liberal individuals are open to change and do not shy away from uncertain situations (Çubukçu, 2004).

In this study, thinking styles inventory the Cronbach alpha values of the legislative, executive, judicial, monarchic, hierarchic, oligarchic, anarchic, global, local, internal, external, liberal, and conservative sub-dimensions of thinking style are found 0.434, 0.550, 0.704, 0.476, 0.511, 0.597, 0.470, 0.572, 0.661, 0.566, 0.333, 0.600, 0.472

2.3.2. Scale of Strategies used while Studying and Learning Instrumental Music (SSLIM)

To determine students' learning and studying strategies, the SSLIM scale developed by Aydıner Uygun and Kılınçer (2018b) and validated for reliability and validity was utilized. The SSLIM scale comprises five sub-dimensions: attention, rehearsal, elaboration, articulation-organization, and comprehension monitoring strategies. Attention strategies involve directing attention to desired sections through marking, such as tone and tempo changes, speed and dynamics variations, difficult passages, ornaments, etc. Rehearsal strategies involve the repetitive practice of musical pieces/etudes on the instrument until it reaches the desired level regarding intonation, rhythm, etc. Elaboration strategies include learning new information by connecting it to existing knowledge. Articulation-organization strategies involve mentally visualizing musical expression and grouping structures that exhibit similarities and differences in music. Comprehension monitoring strategies refer to planning, monitoring, organizing, and making necessary adjustments during the process of learning music (Aydıner Uygun & Kılınçer, 2017a, 2017b).

The SSLIM's Cronbach alpha values of the strategy scale's strategy, repetition, meaning, and articulation-organization sub-dimensions are 0.89, 0.81, 0.85, 0.87, and 0.93, respectively. In this study, SSLIM found that the Cronbach alpha values of the strategy scale's strategy, repetition, meaning, and articulation-organization sub-dimensions were 0.889, 0.868, 0.905, 0.826, and 0.896, respectively.

2.3.3. Personal Information Forms

A personal information form was used to identify participants' gender and class. 40 first year students, 31 second year students, 32 third year students, and 34 fourth-year students participated in the study. A total of 137 students, 67 female, and 70 male students participated in this study. 17 of the female students are in class 1, 18 in class 2, 14 in class 3, and 18 in class 4. Among the male students, 23 are in class 1, 13 in the class 2, 18 in the class 3, and 16 in class 4.

2.4. Data Analysis

The correlation relationship between the SSLIM scale and the experiential learning style scale was examined statistically. The normality of the data was evaluated using histograms, Q-Q plots, and the Shapiro-Wilk test. The relationship between the data was assessed using Pearson correlation analysis. The Levene test was used to test variance homogeneity. To compare the difference between groups, an independent

sample t-test was applied for continuous variables. To compare the difference among groups, an one-way ANOVA was applied for continuous variables. The data analysis was conducted using TURCOSA (Turcosa Analytical Solutions Ltd., www.turcosa.com.tr) statistical software. A *p-value* less than 5% was considered statistically significant.

3. Results

In this section, the thinking styles of students in the music department of GSF and the conservatory were identified using the SSLIM scale. The data obtained from the scales were statistically analyzed internally and about each other, and the findings were presented in detail. Descriptive statistics for the SSLIM scale and the learning styles test are shown in Table 5.

Table 3. Descriptive Statistics on The SSLIM Scale And Thinking Styles Test

Variables	*n*=137	
SSLIM	$\bar{X}$	σ
Attention	19.62	7.22
Rehearsal	21.09	3.86
Elaboration	21.73	5.44
Articulation-organization	18.72	6.23
Comprehension monitoring	57.91	9.01
Thinking Styles		
Legislative	24.45	4.55
Executive	23.94	5.16
Judicial	25.23	5.42
Global	23.45	4.73
Local	24.40	4.64
Liberal	20.75	5.34
Conservative	22.80	4.80
Hierarchical	26.20	4.71
Monarchic	25.06	5.20
Oligarchic	21.38	5.37
Anarchic	21.34	4.74
İnternal	25.21	4.76
External	21.33	4.92

Note. $\bar{X}$:Mean, σ: Standard deviation

The average value of the attention sub-dimension of the SSLIM scale for participating students was found to be 19.62, the average value of the rehearsal sub-dimension was 21.09, the average value of the elaboration sub-dimension was 21.73, the average value of the articulation-organization sub-dimension was 18.72, and the average value of the comprehension monitoring sub-dimension was 57.91. The participants' average value for the legislative learning style was 24.45, the average value for the executive learning style was 23.94, the average value for the judicial learning style was 25.23, the average value for the global learning style was 23.45, the average value for the local learning style was 24.40, the average value for the liberal learning style was 20.75, the average value for the conservative learning style was 22.80, the average value for the hierarchical learning style was 26.20, the average value for the monarchic learning style was 25.06, the average value for the oligarchic learning style was 21.38, the average value for the anarchic learning style was 21.34, the average value for the internal

learning style was 25.21, and the average value for the external learning style was 21.33. The comparison results for the gender variable are provided in Table 4.

Table 4. Comparison Results of SSLIM and Thinking Styles Scales According to Gender Variable

Variables SSLIM	Gender				t	Eta squared	p
	Female(n=67)		Male (n=70)				
	$\bar{X}$	σ	$\bar{X}$	σ			
Attention	20.45	7.32	18.86	7.08	1.282	0.012	0.202
Rehearsal	21.08	3.76	21.10	3.97	0.037	0.001	0.971
Elaboration	21.34	5.73	22.09	5.17	0.797	0.005	0.427
Articulation-organization	19.18	6.83	18.26	5.60	0.850	0.006	0.397
Comprehension monitoring	58.97	8.90	56.86	9.07	1.328	0.014	0.187
Thinking Sytles							
Legislative	24.02	4.55	24.85	4.55	1.057	0.009	0.293
Executive	22.81	4.90	24.99	5.21	2.458	0.045	**0.015**
Judicial	25.52	5.37	24.94	5.49	0.612	0.003	0.541
Global	23.92	4.73	23.01	4.72	1.097	0.009	0.275
Local	24.58	4.08	24.22	5.15	0.437	0.001	0.663
Liberal	20.38	5.35	21.09	5.35	0.759	0.004	0.449
Conservative	22.98	4.40	22.62	5.17	0.437	0.001	0.663
Hierarchical	26.56	4.16	25.86	5.20	0.837	0.005	0.404
Monarchic	25.23	5.30	24.90	5.14	0.371	0.001	0.712
Oligarchic	20.78	5.66	21.96	5.04	1.261	0.012	0.209
Anarchic	21.31	7.84	21.36	4.68	0.055	0.002	0.956
İnternal	25.13	4.77	25.29	4.79	0.199	0.001	0.843
External	21.33	4.71	21.33	5.15	0.006	0.001	0.995

Note. $\bar{X}$:Mean, σ: Standard deviation, t: test values.

As seen in Table 4, the average values for the sub-dimensions of the SSLIM scale, namely attention, rehearsal, elaboration, articulation-organization, and comprehension monitoring, do not create a statistically significant difference between genders (p>0.05). The average value for the executive sub-dimension of learning styles, however, makes a statistically significant difference between genders (p<0.05). It has been observed that the average value of women in the executive learning style is lower than that of men. The average values for the other sub-dimensions of learning styles do not create a statistically significant difference between genders (p>0.05).

Table 5. Comparison Results of SSLIM and Thinking Styles Scales According to Class Variable

Variables	Class 1 (n=40)		Class 2 (n=31)		Class 3 (n=32)		Class 4 (n=34)		F	Eta squared	p
SSLIM	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ			
Attention	19.15	7.55	18.77	8.13	18.29	6.03	22.12	6.65	1.943	0.043	0.126
Rehearsal	20.59	4.63	21.45	3.38	21.27	3.85	21.18	3.38	0.331	0.008	0.803
Elaboration	20.98	6.07	23.17	5.59	20.32	4.46	22.62	5.06	1.993	0.044	0.118
Articulation-organization	19.79	6.60	19.21	6.81	18.10	5.97	17.58	5.45	0.914	0.021	0.436
Comprehension monitoring	56.82	11.30	59.07	7.73	57.55	9.06	58.50	6.99	0.402	0.010	0.752

Thinking Sytles										
Legislative	24.45	4.66	25.03	4.40	24.06	4.24	24.29	4.97	0.242	0.006	0.867
Executive	24.00	5.20	25.17	5.94	24.00	4.60	22.61	4.75	1.260	0.029	0.291
Judicial	25.26	5.35	27.29	5.79	24.55	4.60	23.91	5.46	2.393	0.054	0.072
Global	22.78	3.90	23.37	5.63	23.27	4.78	24.41	4.69	0.727	0.017	0.538
Local	25.14	4.04	24.47	5.10	24.09	4.55	23.82	4.99	0.527	0.012	0.664
Liberal	20.46	4.98	21.53	6.10	21.75	5.63	19.39	4.61	1.345	0.030	0.263
Conservative	22.20	4.93	23.79	5.25	23.16	4.37	22.32	4.64	0.790	0.018	0.502
Hierarchical	26.74	4.82	27.53	4.86	25.29	4.83	25.27	4.16	1.798	0.041	0.151
Monarchic	25.51	5.51	25.86	5.75	24.44	5.32	24.44	4.22	0.636	0.014	0.593
Oligarchic	20.82	5.15	22.30	6.62	21.68	4.56	20.94	5.15	0.536	0.012	0.658
Anarchic	21.03	5.24	21.24	5.12	21.63	4.20	21.50	4.45	0.357	0.008	0.955
İnternal	26.11	3.85	26.07	6.45	24.48	4.81	24.12	3.63	1.629	0.037	0.186
External	21.51	4.88	20.97	4.71	21.26	4.89	21.52	5.39	0.088	0.002	0.966

Note. $\bar{X}$:Mean, σ: Standard deviation, F: test values.

As seen in Table 5, the average values for the sub-dimensions of the SSLIM scale, namely attention, rehearsal, elaboration, articulation-organization, and comprehension monitoring, do not create a statistically significant difference among class (p>0.05).

The average values for the sub-dimensions of the thinking styles scale, namely, legislative, executive, judicial, global, local, liberal, conservative, hierarchical, monarchic, oligarchic, anarchic, internal and external, do not create a statistically significant difference among class (p>0.05) (Table 5). The correlation analysis results for the sub-dimensions of thinking style and SSLIM scales are provided in table 6.

Table 6. The correlation analysis results for the sub-dimensions of SSLIM

Değişkenler	Attention	Rehearsal	Elaboration	Articulation-organization	Comprehension monitoring
Legislative	0.184	0.287	0.346	0.257	0.352
p	0.037	0.001	<0.001	0.004	<0.001
Executive	0.209	0.323	0.363	0.192	0.299
p	0.018	<0.001	<0.001	0.032	0.001
Judicial	0.097	0.240	0.272	0.233	0.295
P	0.279	0.007	0.002	0.010	0.001
Global	0.137	0.317	0.333	0.176	0.333
p	0.122	<0.001	<0.001	0.050	<0.001
Local	0.041	0.431	0.319	0.289	0.368
p	0.642	<0.001	<0.001	0.001	<0.001
Liberal	0.071	0.220	0.260	0.316	0.200
p	0.419	0.012	0.003	<0.001	0.025
Conservative	0.164	0.261	0.374	0.338	0.308
p	0.062	0.003	<0.001	<0.001	<0.001
Hierarchical	0.116	0.233	0.249	0.302	0.262
p	0.195	0.009	0.005	0.001	0.004
Monarchic	0.155	0.181	0.257	0.237	0.158
p	0.077	0.038	0.003	0.007	0.079
Oligarchic	0.125	0.170	0.263	0.305	0.146
p	0.157	0.053	0.002	<0.001	0.106
Anarchic	0.164	0.324	0.371	0.368	0.360
p	0.065	<0.001	<0.001	<0.001	<0.001

İnternal	0.172	0.267	0.234	0.205	0.219
p	0.051	0.002	0.007	0.021	0.014
External	0.072	0.200	0.235	0.275	0.245
p	0.413	0.022	0.007	0.002	0.006

As seen in Table 6, there is a statistically significant but very weak positive relationship between the legislative sub-dimension of the thinking style scale and the attention sub-dimension of the SSLIM scale ($r=0.184$). There is a statistically significant but weak positive relationship between the legislative sub-dimension of the thinking style scale and the rehearsal, elaboration, articulation-organization, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are ($r=0.287$, $r=0.346$, $r=0.257$, $r=0.352$) respectively.

There is a statistically significant but weak positive relationship between the executive sub-dimension of the thinking style scale and the attention, rehearsal, elaboration, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are ($r=0.209$, $r=0.323$, $r=0.363$, $r=0.299$) respectively. There is a statistically significant but very weak positive relationship between the executive sub-dimension of the thinking style scale and the articulation-organization sub-dimension of the SSLIM scale ($r=0.192$).

There is a statistically significant but weak positive relationship between the judicial sub-dimension of the thinking style scale and the rehearsal, elaboration, articulation-organization, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are ($r=0.240$, $r=0.272$, $r=0.233$, $r=0.295$) respectively.

There is a statistically significant but weak positive relationship between the global sub-dimension of the thinking style scale and the rehearsal, elaboration, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are ($r=0.317$, $r=0.333$, $r=0.333$) respectively. There is a statistically significant but very weak positive relationship between the global sub-dimension of the thinking style scale and the articulation-organization sub-dimension of the SSLIM scale ($r=0.176$).

There is a statistically significant moderate positive relationship between the local sub-dimension of the thinking style scale and the rehearsal sub-dimension of the SSLIM scale ($r=0.431$). There is a statistically significant but weak positive relationship between the local sub-dimension of the thinking style scale and the elaboration, articulation-organization, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are ($r=0.319$, $r=0.289$, $r=0.368$) respectively.

There is a statistically significant but weak positive relationship between the liberal sub-dimension of the thinking style scale and the rehearsal, elaboration, articulation-organization, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are ($r=0.220$, $r=0.260$, $r=0.316$, $r=0.200$) respectively.

There is a statistically significant but weak positive relationship between the conservative sub-dimension of the thinking style scale and the rehearsal, elaboration,

articulation-organization, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are (r=0.261, r=0.374, r=0.338, r=0.308) respectively.

There is a statistically significant but weak positive relationship between the hierarchical sub-dimension of the thinking style scale and the rehearsal, elaboration, articulation-organization, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are (r=0.233, r=0.249, r=0.302, r=0.262) respectively.

There is a statistically significant but very weak positive relationship between the monarchic sub-dimension of the thinking style scale and the rehearsal sub-dimension of the SSLIM scale (r=0.181). There is a statistically significant but weak positive relationship between the monarchic sub-dimension of the thinking style scale and the elaboration and articulation-organization sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are (r=0.257, r=0.237) respectively.

There is a statistically significant but weak positive relationship between the oligarchic sub-dimension of the thinking style scale and the articulation-organization and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are (r=0.263, r=0.305) respectively.

There is a statistically significant but weak positive relationship between the anarchic sub-dimension of the thinking style scale and the rehearsal, elaboration, articulation-organization, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are (r=0.324, r=0.371, r=0.368, r=0.360) respectively.

There is a statistically significant but weak positive relationship between the internal sub-dimension of the thinking style scale and the rehearsal, elaboration, articulation-organization, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are (r=0.267, r=0.234, r=0.205, r=0.219) respectively.

There is a statistically significant but weak positive relationship between the external sub-dimension of the thinking style scale and the rehearsal, elaboration, articulation-organization, and comprehension monitoring sub-dimensions of the SSLIM scale. The correlation coefficients for these sub-dimensions are (r=0.200, r=0.235, r=0.275, r=0.245) respectively. There is no statistically significant relationship found between the other sub-dimensions (p>0.05).

4. Discussion and Conclusion

The styles of thinking influence learning, including SSLIM, which has been investigated about the thinking styles of students studying music. In this study, no significant difference was found between the mean values of the subscales of the scales used and the class variable. However, in the study by Akçay (2019), a significant difference was found between thinking styles and the class variable. It is believed that the different results obtained may be due to the differences in the study groups.

In this study, a significant difference in favor of males was found only in the executive subscale of the learning styles scale about the gender variable. There are studies in the

literature that demonstrate some differences in subscale averages obtained from the thinking styles inventory based on gender (Akçay, 2019; Dinçer, 2009; Esmer, 2013). Additionally, no significant difference was found between the gender variable and the subscales of the SSLIM scale in this study. Some studies show that there is no significant difference in strategy use based on gender, which supports the findings of this study (Hagans, 2004), as well as studies that demonstrate differences (Aydıner Uygun & Kılınçer, 2018a). It is thought that the obtained results may be due to the differences in the study groups.

In this study, it was determined that students prefer comprehension monitoring strategy the most among the SSLIM types, while they prefer articulation-organization and attention strategies the least. Similarly, previous studies have found that the comprehension monitoring strategy is used more frequently compared to other strategies (Çelik, 2016), and articulation-organization strategies are used less often compared to other types of strategy (Aydıner Uygun & Kılınçer, 2017b; Aydıner Uygun & Kılınçer, 2018a; Çelik & Kumral, 2016). Geiersbach (2000) stated that individuals using the comprehension monitoring strategy can achieve successful results in a short period. Therefore, the use of comprehension monitoring strategies is essential. Attention strategies involve focusing on marking the music notation to be learned. Studies demonstrate the importance of these strategies for individuals studying music (Fenmen, 1997; Pamir, 1984). In a study conducted by Pamir (1984), the significance of not overlooking details such as ties, ornaments, finger numbers, etc., in piano exercise pieces was emphasized using attention strategies. Fenmen (1997) emphasized the necessity of analyzing the structure of a piece (marking cadences, writing finger numbers on the piece, etc.) to study it effectively. Based on these findings, it is evident that articulation organization and attention strategies are highly important in music. Awareness should be raised, and training should be provided to increase the frequency of using these less utilized strategies in this study.

According to the average values of the study, participants predominantly used hierarchical, judicial, internal, and monarchic thinking styles, while they least utilized liberal, external, anarchic, and oligarchic thinking styles. In this study, participants favored hierarchical thinking the most and liberal thinking the least. In the hierarchical thinking style, individuals focus on multiple tasks simultaneously to efficiently manage their time. These individuals can use their time effectively by prioritizing and working systematically based on the importance of their functions (Sternberg, 1997; Sternberg & Zhang, 2005). The high preference for hierarchical thinking in this research indicates that students work by considering prioritization during their learning stages, utilize their time efficiently, and arrange their tasks according to their importance. Studies support the high usage of hierarchical thinking (Akbulut, 2006; Dinçer, 2009).

On the other hand, individuals with a liberal thinking style are characterized as having creative solid tendencies, being nonconformist, and being willing to take risks (Sternberg & Zhang, 2005). The lower preference for liberal thinking in this study can be interpreted as students being inflexible and rule-oriented. This result is unexpected for students studying in the field of music, where creativity and flexible thinking are essential. Sternberg and Grigorenko (1997) state that thinking styles can undergo lifelong changes and variations. Therefore, it can be said that the development of liberal

thinking styles is necessary for music students, where creativity and flexible thinking are highly valued.

According to the data obtained from the study, participants in the legislative, judicial, global, local, liberal, conservative, hierarchical, monarchic, oligarchic, anarchic, internal, and external thinking styles were found to use attention strategies at a 'very weak' level. In contrast, only participants in the executive thinking style used them at a 'weak' level. Regarding rehearsal strategies, participants in the local thinking style were found to use them at a 'moderate' level. In contrast, participants in the monarchic and oligarchic thinking styles used them at a 'very weak' level, and participants in all other thinking styles used them at a 'weak' level. All participants were found to use elaboration strategies at a 'weak' level. Participants in the executive and global thinking styles were found to use articulation-organization strategies at a 'very weak' level. In contrast, participants in all other thinking styles used them at a 'weak' level. Regarding comprehension monitoring strategies, participants in the monarchic and oligarchic thinking styles used them at a 'very weak' level, while all other participants used them at a 'weak' level.

Considering students' thinking styles is important for realizing an effective learning-teaching process. Instruction tailored to students' thinking styles will be more accessible and enduring. Thus, student-centered instruction can be achieved. Learning strategies based on thinking style should be incorporated as part of quality management in education. Pedagogical courses that use thinking styles and learning strategies can be added to the curriculum, or the course content can be organized to include them.

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