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Research Article ♪ Araştırma Makalesi

Learning needs related to microtonal guitar: An analysis of video comments on YouTube platform

Mikrotonal gitar ile ilgili öğrenme ihtiyaçları: YouTube platformundaki video yorumlarının analizi

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ABSTRACT

Since their introduction in 1826, microtonal guitars (MG) and adjustable fret guitars (AMG) have enabled the use of various microtonal approaches in many genres of music. In recent years, learning and teaching these guitars in informal and formal settings has become quite common. Video sharing platforms have also become important tools for the dissemination of MG performances and informal MG teaching and learning. This study presents a online learning perspective through MG videos on YouTube, perhaps the most effective of these informal environments today, and aims to identify individuals' MG learning needs through these video comments. In this qualitative netnographic study, we obtained primary data through online-ethnographic techniques from 32430 comments on 268 MG videos on the Microtonal Guitar-Tolgahan Çoğulu channel on the YouTube platform, and secondary data through interviews with a group of 5 MG performer and teacher involved in pedagogical, academic and artistic productions on MG. The data was then subjected to content analysis. Collaborative coding was carried out using the qualitative data analysis programme MaxQda Analytics Pro 2020. Through content analysis, some categories common to both formal and informal learning of MG were accessed and learning needs were categorised into 'general knowledge of MG and 'learning-teaching processes of MG. The research findings indicate that learning needs are diverse and provide a landscape from which implications for MG trainers and curriculum developers can be drawn.

Keywords: learning needs, online learning, netnography, microtonal guitar, YouTube

ÖZ

Mikrotonal gitarlar (MG) ve ayarlanabilir perdeli gitarlar (AMG), 1826'daki tanıtımlarından bu yana birçok müzik türünde çeşitli mikrotonal yaklaşımların kullanılmasına olanak sağlamıştır. Son yıllarda bu gitarların resmi ve gayriresmi ortamlarda öğrenilmesi ve öğretilmesi oldukça yaygınlaştı. Video paylaşım platformları da MG performanslarının yayılması ve informal MG öğretimi ve öğrenimi için önemli araçlar haline gelmiştir. Bu çalışma, günümüzde bu informal ortamların belki de en etkilisi olan YouTube'daki MG videoları üzerinden çevrimiçi bir öğrenme perspektifi sunmakta ve bu video yorumları üzerinden bireylerin MG öğrenme ihtiyaçlarını tespit etmeyi amaçlamaktadır. Bu nitel netnografik çalışmada, birincil veriler YouTube platformundaki Mikrotonal Gitar-Tolgahan Çoğulu kanalındaki 268 MG videosuna yapılan 32430 yorumdan online-etnografik tekniklerle, ikincil veriler ise MG üzerine pedagojik, akademik ve sanatsal üretimlerde bulunan 5 MG icracısı ve öğretmeni ile yapılan görüşmelerden elde edilmiştir. Veriler daha sonra içerik analizine tabi tutulmuştur. Ortak kodlama, nitel veri analizi programı MaxQda Analytics Pro 2020 kullanılarak gerçekleştirilmiştir. İçerik analizi yoluyla, MG'nin hem resmi hem de gayri resmi öğrenimi için ortak olan bazı kategorilere erişilmiş ve öğrenme ihtiyaçları 'MG

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Bu araştırma Emre Şengün'ün Sami Emrah Gerekten danışmanlığında yürüttüğü "Mikrotonal gitara ilişkin öğrenme ihtiyaçlarının belirlenmesi ve başlangıç seviyesi için bir repertuvar önerisi" başlıklı yüksek lisans tezinin netnografik verilerinden üretilmiştir.

hakkında genel bilgi' ve 'MG'nin öğrenme-öğretme süreçleri' olarak kategorize edilmiştir. Araştırma bulguları, öğrenme ihtiyaçlarının çok çeşitli olduğunu göstermekte ve MG eğitmenleri ve müfredat geliştiricileri için çıkarımlar yapılabilecek bir manzara sunmaktadır.

Anahtar kelimeler: öğrenme ihtiyaçları, çevrimiçi öğrenme, netnografi, mikrotonal gitar, YouTube

1. INTRODUCTION

Microtonal music has a long history (Çil, 2018; Çoğulu, & Beşiroğlu, 2013; Narushima, 2017) and a wide distribution in many different regions, from the Middle East and Asia to Central and Eastern Europe (Eren, & Güven 2022; Stefanija & Stanevičiūtė, 2020). Although the exact date of its beginning in the West is not known, it is reported that microtonality began to be studied especially by composers of the 16th and 17th centuries (Keislar, 1987), and that new perceptions of this field were formed mostly in the 20th century (Ader, 2009). In the Renaissance it continued with an approach called meantone harpsichord music or Middle Eastern tamperament (Meffen, 1973). It is also known that different societies in the Eastern world produced different microtonal music and used systems based on different microtonal ranges such as 24 quarter tones, 16 tones and 12 tones (McClay, 2014). On the other hand, the Anatolian geography attracts attention with the richness of the number of maqams and maqam compositions in folk music and Ottoman/Classical Turkish music (Benetos & Holzapfel, 2013; Güray, 2012; Öztürk, 2022).

In order to perform microtonal music on different instruments, new explorations have come to the fore in every period, and various instruments have been produced for this purpose (Chadwin, 2019; Forkert, 2020). One of these productions was the 'microtonal guitar' (MG) and many luthiers, performers and academics have designed fretless, fixed and fret-adjustable guitars to achieve microtones on the guitar (Alakavuklar, 2020; Castilla-Ávila, 2021; Özkan & Dönmez, 2014). The microtonal guitar (MG) was first designed by Thomas Perronet Thompson in 1826 under the name 'Enharmonic Guitar' (Lindley, 1984). Subsequently, Rene Lacote and Henry Carnagie Carden, Otto Paret and Paul Kochendorfer, Daniel Friederich and others carried out various studies to improve the MG design. Following the introduction of guitars with movable frets, names such as John Schneider and Harry Partch designed MGs with fixed frets (Fiore, 2012; Schneider, 2015). In the twentieth century, composers such as Julian Carrilo and Alois Haba added additional frets to the guitar and designed guitars with 24 voices in an octave, called 'quarter-tone guitars' (Schneider, 1985), and created works for the performance of these instruments, which require the division of an octave into more unequal intervals than 12 (Carter, 1965; Lysdahl, 2004).

In Turkey, Tolgahan Çoğulu brought innovation to microtonal guitar in 2008 with his adjustable fretted design that can be added to the channels extending across the entire fretboard. These designs were made by adopting microtonal tuning approaches based on different divisions of the octave and called 'meantone', 'just intonation', 'well temperament' (Stoess, 1987). It is easy to see that behind all these MG designs there are basic objectives such as solving intonation problems (Schneider, 2023) and performing maqam structures (Castilla-Ávila, 2023). Today, it is known that the number of official professional institutions where MG is formally taught is quite limited. In Turkey, it is taught as a microtonal guitar masters and PhD program at Istanbul Technical University, Turkish Music State Conservatory Institute of Social Sciences Instrument-Voice Master's Programme, ITÜ Dr. Erol Uçer Music Advanced Research Centre (MIAM) Institute of Social Sciences Master's and PhD Programmes and taught as a non-compulsory course at Anadolu University in Eskişehir.

However, it should be remembered here that social media platforms are a ground that offers very pragmatic benefits and is frequently used by music enthusiasts (Crawford, 2013; Kaya et al., 2010). Recently, the increase in participation in MG-oriented competitions on social media and the number of performances and posts using MG on social media platforms give the impression that interest in MG has increased. It also allows us to predict that these platforms can be seen as an important informal learning tool for those who are starting to learn MG and those who are interested in it, and that social media research in this regard may yield more substantial results than research based on experiences in the few formal educational institutions mentioned above. This is because the rapid increase in the use of social media in the world and its impact on education and training activities has become undeniable (Salavuo, 2008), and these platforms have

started to generate rich datasets where different pedagogical interactions take place and a large amount of ethnographic and pedagogical experiences are shared (Kozinets et al., 2014; Varis, 2015).

Online ethnographic data on the sharing of MG performance and teaching on these platforms has increased, and this has contributed to the formation of groups of people sharing informal MG learning processes. The comments of these groups of people, based on their desire for knowledge on these platforms, provide information about informal and self-regulated learning processes (Dabbagh & Kitsantas, 2012; Kumar & Nanda, 2024). Especially in MG, it can be used to identify learning needs. The identification of learning needs is the first and important step in the curriculum development process (Koçer, 2013). It is necessary to identify learning needs in order to achieve learning objectives, to support the implementation of learning activities and to maintain motivation throughout the learning process (Diep et al., 2019). The analysis of learning needs also makes an important contribution to diagnosing individual problems and evaluating learning (Grant, 2002), and ensures rapid access to the goal through the correct use of educational resources (Şahin et al., 2018).

Related literature

In the literature, a large number of studies have been carried out on a wide range of pedagogical topics such as 'online learning', 'distance learning', 'cooperative learning' and 'active learning' to determine the learning needs of a group of students or teachers on a pedagogical phenomenon in order to improve the quality of the teaching process by analysing students' learning needs (Anderson, 2004; Cotter & Oldham, 2018; Koh et al, 2023; Koutsoupidou, 2014; Perlado Lamo de Espinosa et al., 2021).

The literature on MGs, on the other hand, is very limited and appears to be scattered across relatively disparate topics such as design, tuning, pitches, arrangements and organology. For example, Schneider (2015) analyses the fret and tuning systems of these guitars in his study of MGs designed by Harry Partch. Castilla-Ávila (2021) focuses on MG playing practices, producing compositions for the MG and analysing different playing techniques and tuning systems. Nielsen (2003) focused on the production of MG compositions and studied the theory of pitch, loudness, string vibration frequencies and tuning systems.

Perks (2022), in his recent study, analysed an example from Turkish makam music practices in solo MG. Even in Turkey, one of the last countries to produce MG with adjustable pitch, the number of academic researches is quite small. These studies have a wide range of topics from MG culture in Turkey (Eren & Güven, 2022), makam polyphonic music approaches in MG (Kasap, 2021), adaptation of Turkish music pieces to MG (Çoğulu, 2018) to the development of new guitar types such as lego and automatic MG (Acet et al., 2022). Adıgüzel Sala (2024), on the other hand, dealt with the adaptation and harmonisation of folk songs to classical guitar in her PhD thesis. In another recent study, Ünlenen (2023) examined the way microtones are obtained on traditional guitars and the fret patterns of guitars without 12TET (12 tone equal tamperament), and presented their advantages and disadvantages. Besides two current books (Perez & Çoğulu, 2019; Çoğulu, 2023) are very important. As can be seen, the MG literature contain limited examples of MG learning and teaching.

Also, there are many educational and music studies in the literature that use the netnography method. For example, Cebeci and Esen (2016) examined what Turkish art music and arabesque music listeners in Turkey associate these musics with and why they prefer these musics by content analysing 2535 correspondences, opinions and posts on 20 websites. Azionya and Nhedzi (2021) examined university accessibility during the pandemic by analysing university students' perceptions and experiences in online learning based on 678 tweet data. Perković et al. (2019) investigated user reactions to various music content on the internet with online ethnography method and analysed Serbian religious and traditional music by examining 3 different Youtube channels. Tüzel (2022), in his research on Turkish Ebru art, analysed the number of comments, likes and views on YouTube with the netnography method and found that YouTube users showed more interest in informal video sharing. Atmaca and Gerekten (2023), on the other hand, found that the learning needs of amateur students who managed their self-regulated instrument learning processes through 7 YouTube channels were mainly dominated by learning needs related to tuning and music theory.

1.1. Purpose of the Research

This research is innovative in that it identifies the learning needs of individuals who take a self-regulated approach to informal learning of the MG instrument through social media platforms. We are motivated by

the enormous contribution of netnography to quickly, easily and economically obtaining a large number of opinions of MG interests. Identifying the learning needs of a large number of individuals through netnography can contribute to facilitating MG teaching and improving the quality of the teaching-learning process. For this purpose, we determined the problem of the research as 'What are the learning needs of Youtube users towards MG?' and within the framework of this basic problem, we sought answers to the following sub-problems:

1. What are the users' general learning needs about the MG instrument?
2. What are the learning needs of users for MG 'learning, teaching and performing' processes?

2. METHODS

2.1. Research Model

The research is a netnographic study based on social media ethnography, prepared within the framework of the qualitative paradigm. Netnography is an adaptation of the ethnography method to the online world, which analyses online communities and cultures (Kozinets, 2010; Kulavuz & Vásquez, 2013). The virtual ethnography method is also known as netnography, internet ethnography, online ethnography, network ethnography, cyber ethnography, digital ethnography, web ethnography (Boyd, 2008; Garcia et al., 2009; Howard, 2002; Özbaş-Anbarlı, 2020; Prior & Miller, 2012) and is often used as an effective tool to analyse the opinions, perceptions and attitudes of individuals (Kozinets, 2019). In this study aimed at identifying learning needs related to MG, we turned to netnography based on the intensive use of social media by people interested in music (Nurlybaeva, 2022). In this orientation, the potential of netnography to achieve the goal quickly and prevent labour and time loss was effective as an important advantage.

2.2. Study Group

In the research, we aimed to provide data diversity by obtaining data from a sample of YouTube user comments and a study group consisting of individuals who perform and teach MG. We obtained the comments that will constitute the sample from the channel named 'Microtonal Guitar-Tolgahan Çoğulu' on the YouTube platform, as it has the most followers on this platform as of 30.05.2023. In determining the sample and study group, we preferred criterion sampling, which is a sampling method that meets predetermined criteria and examines all situations (Marshall & Rossman, 2014), as one of the purposive sampling methods. For this reason, we only included in the sample the comments on the mentioned channel that contained 'at least one learning need content for microtonality in guitar'. Table 1 shows that the general characteristics of our sample which was created from comments on Çoğulu's the YouTube channel.

Table 1

Table of Numerical Information About 'Microtonal Guitar-Tolgahan Çoğulu YouTube Channel

Channel	**Microtonal Guitar-Tolgahan Çoğulu/Youtube**
Number of subscribers	117.000
Total number of videos of the channel	616
Number of videos with MG content on the channel	268
Number of comments on videos with microtonal guitar content	32.430
Number of valid comments	719
Access date range	30.05-20.06.2023

In selecting the respondents to be included in the study group, we set the criteria as 'having at least one performance video related to MG on the social media platform and having academic and/or artistic studies on MG'. In order to enrich our study group and reach out to new people (Noy, 2008), we used snowball sampling to reach the participants and they voluntarily participated in the research.

Table 2

Demographic Information Table for The Study Group

	Nickname	Age (years)	Gender	Total time as a performer (years)
1	I1*	42	F	2
2	I2	41	M	5
3	I3	43	M	8
4	I4	30	M	4
5	I5	44	M	10

* Interviewer 1

Table 2 shows that the ages of the interviewees in the study group ranged between 30 and 44, with an average age of 40. The average duration of MG practice of the group, whose average age is quite high, is 5.8 years. The interviewees also produce information, content and academic and/or performance-based artistic productions related to MG. The average age of the study group and the amount of time they have been performing MG indicate that they have sufficient experience for a newly developing guitar genre and performance field.

2.3. Data Collection

For the purpose of netnographic scanning, we first determined the keywords 'mikrotonal gitar', 'microtonal guitar' in accordance with the research problem and started the scanning process by typing these words into the search bar of the YouTube platform in Turk and English languages. In netnographic studies, the groups/groups with rich and detailed content, which can provide the most appropriate answers to the research question, which are most focused on the topic, where the interaction between members is high, and where traffic and communication are intense are selected (Çomu, 2014). For this reason, we determined that the channel that produces the most content about microtonal guitar on the YouTube platform is 'Microtonal Guitar-Tolgahan Çoğulu'. We accessed the data from the Tolgahan Çoğulu YouTube channel and limited the dataset to the videos from this channel. From this YouTube channel, we accessed 268 videos of people performing classical, electronic and acoustic MG. The video content included MG live performances, MG promotional videos, duo and trio microtonal performances, and MG orchestral performances. We scanned all videos on the channel and excluded videos without comments from the research. A total of 32,430 comments were accessed in the videos included in the research.

In order to enrich the netnographic data, we also conducted interviews and used the effectiveness of interviews in revealing one's experiences, thoughts and perceptions (Kahn, 1983; Kvale, 1996; Patton, 1987; Punch, 2005; Uslu & Demir, 2023) to determine the learning needs of the study group between their experiences about MG. In this part, we used the 'Interview Form for Learning Needs Towards Microtonal Guitar', which consists of open-ended questions prepared by the researchers. In the first part of the form there were questions to determine the demographic information of the interviewees and in the second part there were questions to determine the learning needs of the individuals. The interviews were conducted online using the Zoom platform and lasted a total of 121 minutes and 34 seconds. The interviews were then transcribed.

2.4. Analysing Data

The qualitative data obtained through netnography and interviews were subjected to content analysis. In content analysis, certain themes and concepts are brought together, and the judgement of the researcher is presented in a scientific, objective and systematic way (Berelson, 1952; Crabtree & Miller, 1999; Merriam & Grenier, 2019). The data obtained are carried out through coding, categorisation and theming steps (Eysenbach & Köhler, 2002; Miles & Huberman, 1994).

We used MaxQda Analytics Pro 2020 qualitative data analysis software to analyse the survey data. We excluded invalid comments that did not meet the criteria (n: 31711). We considered 719 comments to be valid if they contained at least one learning need related to microtonal guitar. At this point, we set the criterion of 'at least one valid comment per video' and excluded 135 videos with no valid comments. We then give nick to the valid comments according to the channel and order to which they belonged. For example, the nick 'C12' stands for comment number twelve on the Microtonal Guitar- Tolgahan Çoğulu YouTube channel.

2.5. Validity and Reliabity

We chose the channel where the netnographic data is collected because it is the channel where the most content is produced on the topic in question and where follower interaction is most intense. Before analysing the sample comments, we ensured that they met certain criteria.

We ensured data diversity by supplementing the netnographic data with data from the interviews. We revised and applied the semi-structured questions from the interviews by seeking expert opinion. We emailed the transcripts of the interviews we conducted with the participants who met certain criteria to the participants, made the necessary corrections, and obtained their approval for the final version of the text to avoid misunderstandings. The analysis of the transcripts followed the guidelines of Creswell (2015) and the coding and analysis procedures of Saldaña (2014). In addition, we increased reliability by presenting the views of the study group through direct quotations in the text. For coder reliability, Miles and Hubermann's (1994) 'agreement and disagreement' formula was used and a rate of 92% was achieved.

2.6. Ethics

Afyon Kocatepe University Social and Human Sciences Scientific Research and Publication Ethics Board dated 20/12/2023 and numbered 2023/340 that the whole research complies with ethical rules and adheres to the legal requirements of the study country.

3. FINDINGS

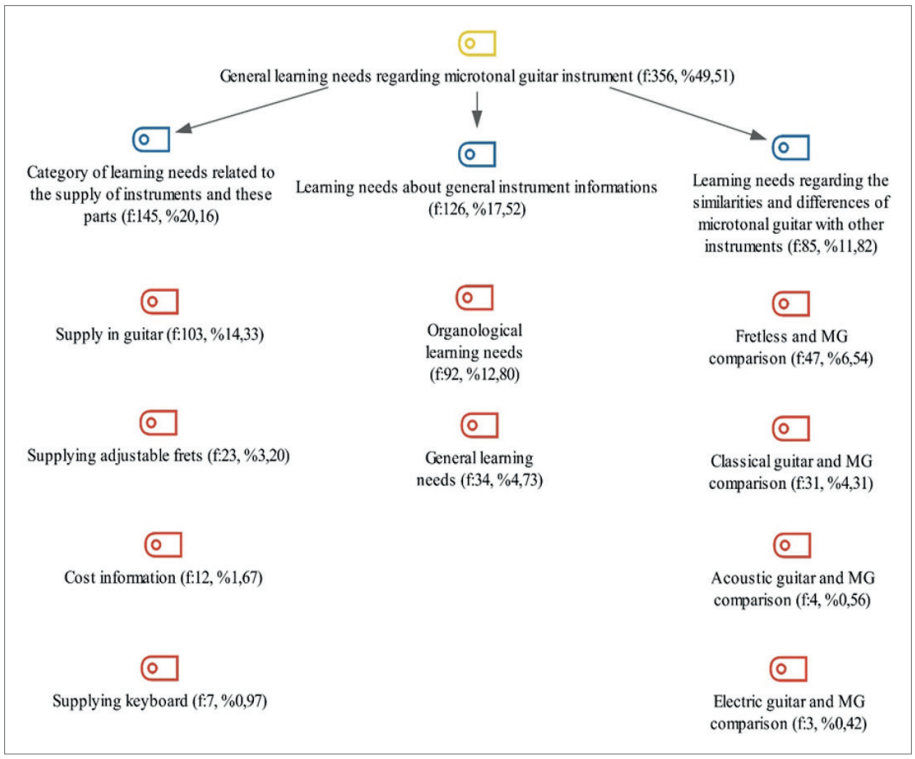
In this section, we present our findings on general information about MG and learning needs for the learning-teaching and execution processes of MG, which were developed after analysing the comments of YouTube users stating their learning needs regarding MG.

Theme 1. Users' general learning needs for MG instrument

In the topic 'General learning needs regarding the microtonal guitar instrument' (f: 356, 49,51%) we created 3 main categories. Quantitatively, the most dominant category is 'category of learning needs related to the supply of instruments and these parts' (f: 145, 20,16%). This category is followed by 'learning needs about general instrument informations' (f: 126, 17,52%). The last category is 'learning needs regarding the similarities and differences of microtonal guitar with other instruments' (f: 85, 11,82%). The general view of the thematic, code-category hierarchy formed after the content analysis of the netnographic data obtained is as follows:

Figure 1

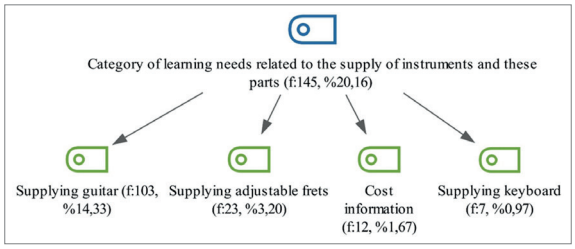
Code-Category Hierarchy Map of General Learning Needs for MG



The most dominant category in terms of the number of learning needs is the category of learning needs related to the supply of the instrument and its parts. In the category of learning needs related to the supply of instrument and these parts, there are 4 codes: 'supply in guitar' (f: 103, 14,33%), 'supplying adjustable frets' (f: 23, 3,20%), 'cost information' (f: 12, 1,67%) and 'supplying keyboard' (f: 7, 0,97%). The hierarchical map of the category is as follows:

Figure 2

Code-Category Hierarchy Map of Learning Needs Related to Supply Instruments and These Parts



MG basically consists of two parts. The first part can be considered as the keyboard and the second part as the body of the guitar. In most of the MGs, these two parts can be joined together. In different types of guitars, MGs can also be obtained by gluing or embedding additional frets, usually 1 cm long, to the fretboard. It is seen that the learning needs coded as supply anything about MG are dominant and quite numerous. Youtube users need information on how and at what cost they can obtain the guitar, each part and additional frets:

'Where can I buy such a guitar? I live in Southeast Asia' (C318).

'Is it possible to buy a custom-made movable keyboard like the one you play?' (C420).

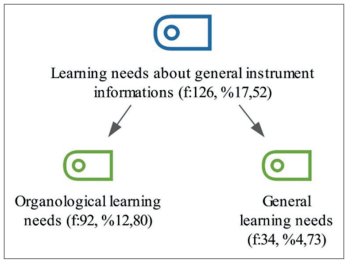
'I would like to get a microtonal guitar and take care of it separately. I wonder how can I get these frets?' (C203).

'How much does a microtonal guitar cost?' (C436).

The category ' Category of learning needs related to the supply of the instrument and these parts' is followed by the category 'Learning needs about general instrument informations'. There are 2 codes in this category: 'organological learning needs' (f: 92, 12.80%) and 'general learning needs' (f: 34, 4.73%). The code category hierarchy map is shown in the Figure 3:

Figure 3

Code-Category Hierarchy Map of Learning Needs About General Instrument Informations



Adjustable microtonal keyboards are designed differently to standard guitar keyboards. These keyboards offer possibilities such as easy removal and insertion of extra frets, users can move the extra frets to the desired position and make the each fret fretless. These keyboards, which have been designed in recent years, are attracting a lot of attention because they have a different structure from standard guitar keyboards. It has been observed that this interest and curiosity is mainly focused on the variety of keyboards and the practice of fret gluing. There is also curiosity as to whether there are any problems with the sounds that can be obtained in terms of formal characteristics after these frets have been mounted on the fingerboard.

The comments on learning needs in the codes 'Organological learning needs' and 'General learning needs' are quite high. These comments generally relate to information about the keyboard, such as the material from which the keyboard is made, how the frets move on the keyboard, how the extra frets can be mounted on the keyboard and to what dimensions they can be attached to the keyboard.

'I am very curious about the mechanics of the fretboard, is it made of wood or some other material?' (C518).

'How can I get a fret that can be glued to the electric guitar and with which material is this fret glued to the fretboard? Won't the fretboard get damaged over time?' (C510).

'What is the difference between a microtonal fretboard and a true tampereman one?' (C250).

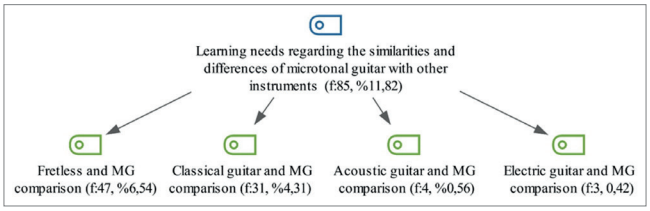
The comments among the interview data on the issue of gluing additional frets, which YouTube users are particularly curious about, also support this situation. They stated that they generally use additional frets by pasting them on the keyboard and that they experience difficulties during performance.

'When gluing frets, gluing too many frets distorts the sound of the guitar. A glued fret can also prevent the other non-microtonal frets to the right and left of that fret from producing sound' (I1).

The last category related to the theme 'General learning needs regarding microtonal guitar instrument' is 'Learning needs regarding the similarities and differences of microtonal guitar with other instruments. In this category, there are 4 different codes as 'Fretless and MG comparison' (f: 47, 6,54%), 'Classical guitar and MG comparison' (f: 31, 4,31%), 'Acoustic guitar and MG comparison' (f: 4, 0,56%), 'Electric guitar and MG comparison' (f: 3, 0,42%) respectively. The related code-category map is presented in Figure 4:

Figure 4

Code-Category Hierarchy Map of Learning Needs Regarding the Similarities and Differences of MG With Other Instruments



Microtones can be obtained by adding extra frets, fixed frets or adjustable keyboards to different types of guitars. In other words, microtonal music can be played on different types of guitars without changing the original timbre of the guitar. YouTube users' comments on the codes 'Fretless and MG comparison' (f: 47, 6,54%), 'Classical and MG comparison' (f: 31, 4,31%), 'Acoustic and MG comparison' (f: 4, 0,56%), 'Electric and MG comparison' (f: 3, 0,42%) show a need for information about different types of guitars. They want information about why MGs are preferred to fretless guitars, the differences in frets between classical guitars and MGs and how to play them in terms of difficulty and ease, the applicability of microtones on acoustic guitars and how to get the right sound, and the installation of extra frets on electric guitars:

'Why a microtonal guitar or adjustable microtonal guitar when there is a fretless guitar? What's the advantage of fretless guitar?' (C615).

'Do you have a chance to do this on a standard classical guitar so that we can compare the differences in notes?' (C409).

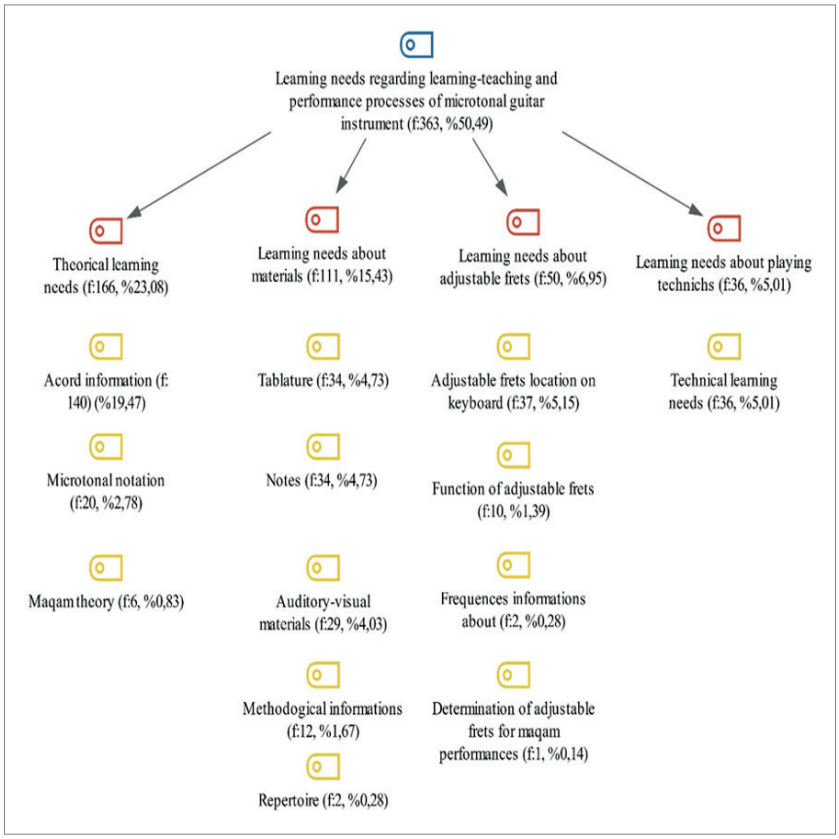
'Is it possible to add frets to an acoustic or electric guitar?' (C220).

Theme 2. Learning needs regarding learning teaching and performance processes of MG

In this section, the findings obtained after the content analysis of the comments including the statements on learning, teaching and performance processes related to MG obtained through netnography and interview techniques are presented. The theme 'Learning needs regarding the learning-teaching-performing processes of the microtonal guitar instrument' consists of 4 main categories. The most dominant of these categories is 'Theoretical learning needs' (f: 166, 23,08%). This category is followed by 'learning needs about materials' (f: 111, 15,43%), 'Learning needs about adjustable frets' (f: 50, 6,95%) and 'Learning needs about playing technichs' (f: 36, 5,01%). There are many codes in 4 categories in the theme of learning needs related to the learning-teaching and performing processes of the microtonal guitar instrument. After the content analysis of the interview results, the hierarchical map of the themes, categories and codes is presented in Figure 5:

Figure 5

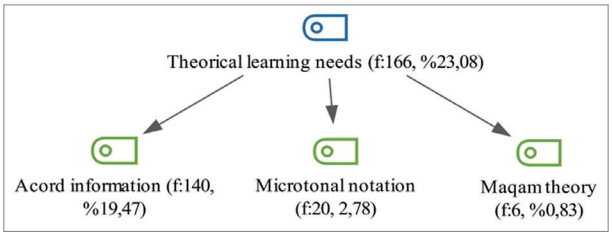
Code-Category Hierarchy Map Related to Learning, Teaching and Performance Processes of MG Instrument



Theorical learning needs category consisted of 3 codes: 'Acord information' (f: 140, 19,47%), 'Microtonal notation' (f: 20, 2,78%), 'Maqam theory' (f: 6, 0,83%). The code-category hierarchy map is presented in Figure 6:

Figure 6

Code-Category Hierarchy Map for The Theoretical Learning Needs Category



The comments of the YouTube users in the category 'Theoretical learning needs' show the learning needs related to the codes 'acord information', 'microtonal notation' and 'maqam theory'. According to the data obtained, the topics of interest include how microtones are obtained in different tuning systems, how fret positions and hertz ratios of strings change, how microtones are represented in musical notation, the locations of fret positions, the intervals of the maqam and which maqams can be played in MG, how chords can be used to play music in Turkish music maqams in MG:

'Is the string tuning scheme normal or E, F#, C#, F#, F#, B, E (shaped)?' (C09).

'How do you write microtonal music? You need a different kind of notation, don't you?' (C469).

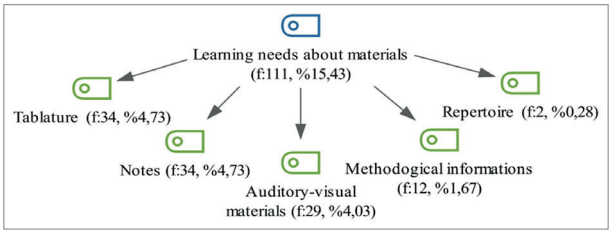
'Where should I add bass pitches for the uşşak maqam' (C428).

'For example, in the uşşak maqam or in the hüseyni maqam, which chord (should I) play?' (I2).

In the category of 'learning needs about materials', there are 5 codes: 'tablature' (3,4%), 'notes' (3,4%), 'auditory-visual materials' (2,9%), 'methodological informations' (1,2%), 'repertoire' (0,2%). The code category hierarchy map is presented in Figure 7:

Figure 7

Code-Category Hierarchy Map for The Category of Need for Instructional Materials



In the process of learning and teaching instruments, work repertoires, methodologies, videos and albums with lesson content on social media platforms are of great importance. However, the scarcity of instructional videos and the lack of printed materials often pose significant difficulties for beginners. Some of these methodological problems are related to learning the basic principles of guitar performance and playing techniques. There is an emerging need for more comprehensive and systematic teaching materials in the field of MG and MG sheet music. Some sample comments are given below:

'Where can we find notes/tabs for microtonal songs?' (C684).

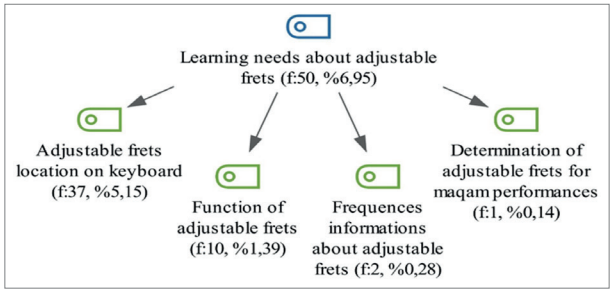
'Is there any material we can use for microtonal practice?' (C360).

'Teacher, do you have a guide video or any other document that predicts where to place the additional frets on the microtonal guitar depending on which maqam they will be placed?' (C373).

In the category of 'Learning needs about adjustable frets', 4 codes were created: 'adjustable frets location on keyboard' (f: 37, 5,15%), 'Function of adjustable frets' (f: 10, 1,39%), 'Frequences informations about (f: 2, 0,28%), 'Determination of adjustable frets for maqam performances (f: 1, 0,14%). The code-category hierarchy map is presented in Figure 8:

Figure 8

Code-Category Hierarchy Map for The Category of Need for Instructional Materials



For new MG performers, it is important to know how many cent intervals the adjustable frets should be placed in and where on the keyboard. To play maqam music with MG, it is necessary to adjust the position of the frets according to the maqam and the course to be played. Some commentators who are less familiar with microtonal music find it difficult to understand why extra frets are used on the guitar and why the sounds are different from those of a standard guitar. YouTube users' comments on the codes 'Adjustable frets location on keyboard', 'Function of adjustable', 'Frequences informations about adjustable frets', 'Determination of adjustable frets for maqam performances' reveal a new learning need. There is a need to learn the cent information, the function of the adjustable frets and the positions of the frets according to the maqam. Some sample comments are given below:

'On a tunable microtonal guitar, when you move the frets, what is the minimum distance between each microtone? Is it 5 cents, 10 cents, more?' (C165).

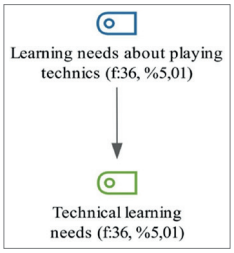
'Do these frets you glued on produce coma sounds?' (C209).

'So that's all the additional pitches you need for the maqam?' (C431).

The category 'learning needs about playing technics' consists of only the code "technical learning needs' (f: 36) (5,01%). Figure code-category hierarchy map is presented in Figure 9:

Figure 9

Code-Category Hierarchy Map for The Category of Technical Needs Category



Comments in the 'technical learning needs' code often included comments about the bend technique. The comments in this category, which focused on the question 'How to play the bend technique in MG', also included learning needs related to different guitar techniques such as 'barre', 'bend' and 'arpeggio'. The number of comments referring to learning needs related to different playing techniques and styles is also quite high:

'I think it is very important to learn the performance style. It is not enough to know the manner and ornaments (it is necessary to learn) the maqam itself' (I3).

'Can you bend arpeggios, chords or fast passages?' (C696).

'Is the use of the barre comfortable on the second guitar you play?' (C709).

4. DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

In this study we wanted to identify the learning needs of YouTube users for MG through their comments on MG videos. We also obtained data to support the netnographic data through in-depth interviews and after analysing these data, we categorised the codes we obtained after categorising the learning needs into two themes as 'general learning needs regarding microtonal guitar instruments' and 'Learning needs regarding learning-teaching and performance processes of microtonal guitar instrument'. The analysis of the YouTube comments on the topic of general learning needs regarding microtonal guitar instruments shows that users are mainly trying to find out where and how to get the guitar, fretboard and add-on frets. This can be explained by the fact that MGs are less common than other types of guitars and the marketing network is weak. This means that each musical instrument appeals to a specific purchasing power (Shaopeng et al., 2021). It is natural for YouTube users to want to find out how much they can buy the guitar and its parts. Instrument making is not only a profession, but also a commercial sector where a certain margin of labour profit is considered in addition to raw materials, inputs and other costs (Nex, 2013). The finding characteristics show that the users are different from any guitar beginner's problems. The needs in Figure 1, such as how to obtain the guitar and its parts, how to configure it organologically, and similarities and differences with other types of guitars, are quite different from beginner learning needs, such as physical setup and holding the guitar. Although we cannot determine the level of the users, it is possible to say that their needs are concentrated at the post-beginner level of basic guitar practice. In addition, Figure 2 shows that the users' needs for theoretical knowledge, teaching materials, additional fret practice and how to apply the techniques they know on the MG are more related to adapting to a modified instrument than to beginner level needs. With these findings, the study differs from other studies that have investigated other instruments that have been taught online (Atmaca & Gerekten, 2023; Gülüm, 2023; Sanabria-Acero & Casals, 2024).

For new performers, knowledge about the instrument and its general construction is an important source of motivation (Hallam, 2002). The fact that the next dominant learning needs of MG-interested Youtube users are organological details such as the wood from which the keyboard is made, the structure and ergonomics of the adjustable frets, confirms Hallam (2002) in this context. If the keyboard with adjustable frets and grooves designed in recent years is to use microtones by gluing the frets to the fingerboard, the knowledge of how to glue these frets to the fingerboard is one of the factors that directly affects the motivation to learn the instrument.

Instruments can be classified in different ways (Hornbostel & Curt, 1992; Kartomi, 1990; Sachs, 1914). The MG, as a type of guitar, has a more interesting and different position in the 'guitar instrument family' (Ünlenen, 2023) due to its unique temperament and its role in the performance of different microtonal music, but when analysing the comments of YouTube users, we found that users compared the MG with fretless, acoustic, classical and electronic guitars in the guitar family in terms of advantages, performance potential and playing practices. This seems to be a way for YouTube users to position the MG in the guitar family, pointing to a number of issues where they are curious about the features that distinguish the MG from other guitars (Adıgüzel Sala, 2024; Schneider, 2015) and its potential.

Knowledge of notation systems and knowledge of modal and tonal theory provide significant performance advantages, especially for beginners (Tejada & Spain, 2009). The analysis of the YouTube comments under the 'Learning needs regarding learning-teaching and performance processes of microtonal guitar instrument and performance processes also points to learning needs in theoretical subjects such as 'tuning', 'microtonal notation' and 'maqam'. The need for tuning knowledge among our findings is consistent with the findings of Atmaca and Gerekten (2023) in their study of learning needs for a traditional Anatolian instrument.

The methodology ensures that the work can be applied in a systematic way (Burnard, 2006). Users' comments on the need for MG teaching and learning methods are numerous. We found that users need ways of accessing notes, materials and various documents to guide them on 'how' to learn and 'with what tools' to learn. Notes, tablature, auditory and visual materials are very important for performing an instrument (Kararoğlu, 2009). The many and varied needs emphasised by the participants in the comments in this section, such as different tuning systems, hertz information of the strings, transfer of microtones into notation, maqam theory documents, notes, repertoires, tablatures and other written materials, provide important clues for structuring the methodology of MG teaching.

An important part of the learning needs for MGs are microtonal practices related to adjusting pitches'. In MG, it is possible to make pitch additions and adjustments based on different microtonal approaches (Schneider, 2015). As with any instrument, it is important to have pitch frequency information, and pitch frequency adjustments vary depending on the person, type of music, tonal structure, history, sound systems and schools (Siedenburg et al., 2021). In other words, determining the position of these pitches on the keyboard is based on basic and pragmatic frequency knowledge, the type of microtonal music and tuning to be preferred, and ornamentation, and our research findings show that it constitutes some of the basic learning needs, especially for those interested in learning MG.

Limitations and Future Research

This research was limited to the content of MG live performances, MG promotional videos, duo and trio microtonal guitar performances, MG orchestral performances on the channel named 'Microtonal Guitar-Tolgahan Çoğulu' on the YouTube platform, and only user comments related to learning needs were included in the data set. The fact that YouTube ranked second in the ranking of the most used platforms in the world was effective in selecting it for data collection (Similarweb, 2024). A sample of MG video comments on other social media and video sharing sites such as Facebook, Instagram and TikTok may be useful to obtain comparative results. This study did not investigate the learning needs of MG in formal and informal education processes. The experiences of students, teachers, performers and artists in these institutions regarding the learning needs they encounter in MG learning processes can be explored from a phenomenological perspective. Due to netnographic limitations, it was not possible to obtain demographic characteristics of the users. Future researchers can obtain more comprehensive data on learning needs for MG by choosing research designs that can collect users' age, experience, country of residence and other cultural characteristics in order to determine how learning needs vary according to the profile of the individual. The data analysis used numerical statistics to determine the distribution and frequency of codes. Repeating the study in the future may allow the description of changing trends and new learning needs and increase the generalisability of the findings. In addition, the lack of literature on teaching the MG instrument through social media platforms made it difficult to discuss the data from the study in a multidimensional way.

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Ethical approval

The study was approved by Afyon Kocatepe University Social and Human Sciences Scientific Research and Publication Ethics Committee (Date of ethical evaluation decisions: 1.) 20.12.2023, 2.) 12.04.2023; Numbers of ethical evaluation documents: 1.) 2023/340 2.) 2023/129.

Author contribution

Study conception and design SEG; data collection: EŞ, SEG; analysis and interpretation of results: EŞ, SEG; draft manuscript preparation: EŞ, SEG. All authors reviewed the results and approved the final version of the article.

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The authors declare that there is no conflict of interest.

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GENİŞLETİLMİŞ TÜRKÇE ÖZET

1. Giriş

Mikrotonal gitar (MG), 1826 yılında Thomas Perronet Thompson tarafından "Enharmonik Gitar" adıyla tasarlanmış ve zamanla farklı luthiyeler, icracılar ve akademisyenler tarafından geliştirilmiştir (Lindley, 1984; Schneider, 2015). Türkiye'de ise Tolgahan Çoğulu, 2008 yılında tüm klavyede uzanan kanallara eklenebilen ayarlanabilir perdeli tasarımıyla mikrotonal gitara yenilik getirmiştir. Mikrotonal müzik, Orta Doğu, Asya ve

Avrupa gibi farklı coğrafyalarda zengin bir tarihe sahip olmakla birlikte (Çoğulu & Beşiroğlu, 2013; Stefanija & Stanevičiūtė, 2020), MG'nin öğrenim ve öğretim süreçleri henüz yeterince araştırılmamıştır.

Günümüzde sosyal medya platformları, özellikle YouTube, enformel öğrenme süreçleri için önemli bir araç haline gelmiştir (Kozinets, 2019; Salavuo, 2008). Bu çalışma, YouTube üzerindeki MG videolarının yorumlarını analiz ederek, kullanıcıların MG öğrenim ihtiyaçlarını belirlemeyi amaçlamaktadır. Araştırmanın temel problemi, "YouTube kullanıcılarının MG'ye yönelik öğrenim ihtiyaçları nelerdir?" sorusudur.

2. Metodoloji

Bu araştırma, nitel paradigma çerçevesinde hazırlanan bir netnografi çalışmasıdır. Netnografi, çevrimiçi toplulukların ve kültürlerin analizine olanak sağlayan bir yöntemdir (Kozinets, 2010; Kulavuz & Vásquez, 2013). Veri toplama sürecinde, YouTube platformundaki "Microtonal Guitar-Tolgahan Çoğulu" kanalındaki 268 MG videosuna ait 32.430 yorum incelenmiş ve bunlardan 719'u geçerli kabul edilmiştir. Geçerli yorumlar, "en az bir mikrotonal gitar öğrenim ihtiyacı içermek" kriterine göre seçilmiştir.

Ayrıca, MG performansçısı ve eğitimcisi olan 5 katılımcıyla yarı yapılandırılmış görüşmeler gerçekleştirilmiştir. Verilerin analizinde MaxQda Analytics Pro 2020 yazılımı kullanılmış ve içerik analizi yöntemiyle kodlar, kategoriler ve temalar oluşturulmuştur (Miles & Huberman, 1994; Saldaña, 2014). Kodlayıcı güvenilirliği için Miles ve Hubermann'ın "anlaşma ve anlaşmazlık" formülü uygulanmış ve %92 oranında güvenilirlik sağlanmıştır.

3. Bulgular, Tartışma ve Sonuçlar

Araştırmanın bulguları, MG Enstrümanına Yönelik Genel Öğrenim İhtiyaçları ve MG Öğrenim, Öğretim ve İcra Süreçlerine Yönelik Öğrenim İhtiyaçları şeklinde, iki ana tema altında toplanmıştır.

Kullanıcılar, MG'nin ve ayarlanabilir perdelerin nereden temin edileceği, maliyet bilgisi ve klavye temini gibi konularda bilgi ihtiyacı duymaktadır. Klavyenin malzemesi, ekstra perdelerin nasıl monte edileceği ve ses kalitesi gibi organolojik detaylar merak edilmektedir. MG'nin fretless, klasik ve elektro gitarlardan farkları sorgulanmıştır. Ayrıca akort sistemleri, mikrotonal nota yazımı ve makam teorisi en çok talep edilen konulardır. Tablature, nota ve metodolojiye yönelik kaynak eksikliği dile getirilmiştir. Teknik İhtiyaçlar: Bend, barre ve arpej gibi tekniklerin MG'de nasıl uygulanacağı sorgulanmıştır.

Tartışma ve Sonuçlar

Bulgu analizleri, MG öğrenim süreçlerinin standart gitardan farklı olduğunu göstermektedir. Özellikle enstrüman temini ve teorik bilgi eksikliği, başlangıç seviyesindeki kullanıcılar için önemli engeller oluşturmaktadır. Hallam (2002), enstrüman bilgisinin motivasyonu artırdığını vurgulamıştır; bu durum, kullanıcıların organolojik detaylara olan ilgisiyle örtüşmektedir. Ayrıca, mikrotonal müziğin karmaşık yapısı, nota yazımı ve makam teorisi gibi konularda sistematik eğitim materyallerine duyulan ihtiyacı ortaya çıkarmıştır (Atmaca & Gerekten, 2023). Bu çalışma, MG öğrenim ihtiyaçlarını belirleyerek eğitimciler ve müfredat geliştiriciler için önemli bir kaynak sunmaktadır. Gelecek araştırmalarda, farklı sosyal medya platformlarının karşılaştırılması ve kullanıcı demografik özelliklerinin incelenmesi önerilmektedir.