

Harmony Teaching Research — Implication for Music Education

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Abstract

This study aims to find out how students' executive function skills are impacted by music instruction, especially harmonic instruction. The study adheres to ethical standards, ensuring participant confidentiality and freely given, informed consent. The introduction, which also provides background information on the importance of music education, outlines the goals and objectives of the study. In this review of the literature, we focus on constructivism and sociocultural theory as the theoretical frameworks for our analysis of the studies on music education and its impact on cognitive development. The techniques section describes the tools and how they were used; a questionnaire and open-ended comments were used to collect the data. The findings section includes both quantitative and qualitative results. The quantitative findings show a statistically significant positive association between executive function skill reports and the intensity of harmonic teaching, which may indicate a link between higher harmonic education progress and better executive function ability rises. The qualitative findings provide additional insights into the viewpoints and experiences of the participants, which strengthens the research. The conclusion summarizes the main findings and identifies the study's limitations. Overall, emphasizes the value of music instruction in developing well-rounded individuals and presents solutions for integrating music instruction into the larger educational system that are supported by research. Because of the study's rigorous research design, dedication to ethical principles, and use of appropriate statistical procedures and analytic tools, the findings are more believable and legitimate. The study's findings and recommendations are meant to improve formal music education programs and advance understanding of how music education fosters students' creativity and cognitive skills.

Keywords: harmony, music education, Jazz, China, primary school

1. Introduction

Despite tremendous technology advancements and shifting educational environments, music education continues to play a crucial role in the development of well-rounded individuals. Music is a great instrument for developing intellectual growth and original ideas since it has a tremendous impact on the cerebral, emotional, and social components of human progress (Dahl, 2004; Thaut, 2013). In this study, the transfer effects of music education are examined, with a focus on the numerous benefits for students and the ways in which it aids in their overall development. According to Clarke, DeNora, and Vuoskoski (2015), music is one form of art that has the power to transcend cultural boundaries and touch the core of the human psyche. You could experience things, be inspired, and communicate your argument more effectively as a result. Children who participate in musical activities have access to educational possibilities that go well beyond pitch and rhythm, whether they are singing, playing an instrument, or performing in a group (Dahary et al., 2023). Students have the perfect environment to refine critical thinking, problem-solving, collaboration, and communication skills that are essential for success in today's interconnected world via the study of music (Golinkoff & Hirsh-Pasek, 2016).

1.1 Background

One of the most remarkable findings in this area is the positive impact that music instruction has on a person's

cognitive development. The auditory experience of music has been scientifically shown to offer a wide range of cognitive benefits, including improved memory, improved attention, improved spatial-temporal awareness, and improved executive functions. Understanding musical notation well emerges as a powerful method for developing pattern recognition skills, which in turn fosters the development of neural circuitry and cognitive nimbleness (Curtis & Fallin, 2014). In addition, children can benefit from learning music because of the way it encourages them to think proportionally and apply mathematical concepts through the interplay of melody, harmony, and rhythm (Calik & Birgili, 2013).

The development of important emotional intelligence skills like empathy, self-awareness, and emotional regulation is also facilitated by musical training (Küpana, 2015). Students are encouraged to access their emotions during the composition process and showcase those sentiments in their final performances. Students who take part in this type of introspection and self-expression are better able to control their own emotions and understand the sensations conveyed by the music (Jääskeläinen, 2023). They gain valuable life skills that may enhance their well-being and the quality of their connections with others, and their musical understanding is enhanced as a bonus.

Education in music provides a unique environment that encourages collaboration, teamwork, and cultural sensitivity, all of which benefit society. Group activities like choirs, bands, and orchestras need students to be able to coordinate their actions, pay close attention to one another while listening, and work together toward a common goal (Myers et al., 2013). Students learn to value differences, respect opposing viewpoints, and cooperate productively as part of a larger community through various types of group projects.

Learning about music also helps students become more open-minded and imaginative. The development of creative thinking assumes a crucial role in the modern environment, which is characterized by rapid technological advancement and a rising desire for innovation. When students are given possibilities in the field of music, they are encouraged to explore different musical paradigms, find their own original artistic expressions, and make original decisions about their performances (Coulson & Burke, 2013). In addition to enhancing musical ability, these creative processes encourage a way of thinking that is open to novelty, adaptability, and risk-taking. These qualities are crucial to success in any field.

1.2 Aims and Objectives

Aims:

Examine the wide range of possible gains from musical instruction and how they connect to students' entire maturation and development.

Among the goals of this study are the following:

- To learn how music education helps children grow mentally, emotionally, socially, and creatively.
- To provide an in-depth understanding of how students may benefit from music education in terms of developing their ability to think critically, solve problems creatively, work together effectively, and communicate effectively.
- To highlight the proven benefits of music instruction on student achievement in areas like memory, focus, spatial-temporal reasoning, and executive function.
- To study music education's societal implications.

Education's capacity to foster not just creative and innovative thinking, but also an openness to individuality, flexibility, and risk-taking. To achieve these aims the research will conduct a literature review and analysis of the benefits and drawbacks of music education across a range of student development areas. Additionally, the research collects information from music teachers, students, and experts in the field to better understand the effects of music education.

Objectives:

- To critically examine the existing literature, identify knowledge gaps about the effects of music education, and suggest new lines of inquiry into these topics.
- To provide policymakers, teachers, and other stakeholders with evidence-based recommendations for integrating music instruction into the wider educational system.
- To promote understanding of the value of music education.

2. Literature Review

Music education plays a significant role in the evolution of human culture and society. It is crucial to comprehend its relevance to explore its historical development throughout many cultures and eras, the contributions of significant pioneers, and the enduring impact of previous music education ideologies on current

practices. Music played a significant role in religious ceremonies, cultural traditions, and the transmission of information from one generation to the next in ancient civilizations, where it can be seen as the origin of music education (Floyd Jr, 1996). Music was a crucial component of temple rites in ancient Egypt, and it was also taught to musicians to prepare them for ceremonial performances (Emerit, 2013). Similarly, Whittaker (1961) claims that ancient Greece included music instruction as a component of a well-rounded education to enhance students' moral character and intelligence. Globally diverse musical expressions are the outcome of music education adapted to various communities' ideals and ambitions (Schippers & Bartleet, 2013). Additionally, past approaches to music instruction continue to impact current methods. Music conservatories and organized music education systems were established due to the Enlightenment movement's promotion of reason and critical thinking in Europe (Keene, 2009). Educator and philosopher John Dewey prioritized experiential learning and active involvement in music education in the 20th century (Hein, 2004).

As a core component of music, harmony is essential to music education. Harmony stimulates creativity, increases musical awareness, and improves the listening experience (Sabina & Senad, 2021). The pedagogical strategies and methods used to instruct students on the concepts and applications of harmony are collectively referred to as harmony teaching in music education. It teaches the fundamentals of voice leading, harmonic analysis, tonal relationships, and chord progressions (Lynch, 2012; Russell, 2018). According to Cohn (2012) harmony instruction frequently starts with studying fundamental intervals, scales, and triads before advancing to more complicated ideas like modulation, chromatic harmony, and extended chords.

For several reasons, harmony is crucial to music study. Firstly, it gives compositions a structural foundation that arranges musical parts and gives them coherence (Lilja, 2009; Eigenfeldt et al., 2016). Student's ability to analyse and interpret musical pieces improves with a solid understanding of harmony. According to Arar (2017), harmony promotes creativity by enabling students to try chord progressions and harmonization, improving composition and improvisational skills. Additionally, harmony helps the growth of aural abilities. Students who study harmony improve their capacity to recognize and distinguish distinct tonal connections, intervals, and chord characteristics, which improves their listening skills (Kariuki & Ross, 2017). As students become more competent at identifying harmonic patterns and progressions in written music, a strong foundation in harmony also supports sight-reading and sight-singing abilities (Sanders, 2015).

Different philosophical stances impact how harmony is taught in music education. Lautner (2015) indicates that the learning of harmonic knowledge occurs through cognitive processes like analysis, memorization, and problem-solving in his study on Mental pictures in Porphyry's commentary on Ptolemy's Harmonics. According to this viewpoint, harmony is a set of guidelines that can be systematically taught and learned. The constructivist method is another philosophical viewpoint that contends that students actively develop their knowledge of harmony via their interactions and experiences with musical materials. This viewpoint promotes student-centred learning, whereby pupils play with and learn about harmonic principles through improvisation and group projects (Colwell & Webster, 2011). As it influences many different facets of musicianship, harmony is closely related to the growth of music. Harmony serves as a basis for fundamental tonal comprehension and the growth of aural abilities in the early stages of musical development (Schellenberg et al., 2005). Harmony enables learners to connect with more complicated musical structures and examine the harmonic language used by artists across different styles and times (Savage, 2005). Additionally, harmony aids in the development of musical expression and interpretation. Students can improve their musical interpretations by making educated decisions about phrasing, dynamics, and articulation by comprehending the harmonic considerations made by composers (Holmes, 2005). Additionally, studying harmony helps students develop critical listening skills, enabling them to hear subtle harmonic differences and recognize the emotional and expressive aspects of different harmonic choices.

Harmony learning is a crucial aspect of music education, and investigating how it is used in Chinese high schools and colleges offers insightful information. Chinese high schools and colleges display numerous commonalities and variances in their harmonious learning experiences. According to research by Snell and Azzara (2015), high schools and colleges strongly emphasize learning fundamental harmonic concepts, deciphering chord progressions, and using those concepts in composition and improvisation. However, there are differences in the complexity and depth of harmonious learning between the two teaching phases. In harmony learning, the curricula and pedagogical methods used in Chinese high schools and universities also differ. Harmony instruction is frequently included in comprehensive music courses in high schools, where students study harmony and other musical aspects, including melody, rhythm, and form (Snell & Azzara, 2015). On the other hand, colleges frequently provide specialist harmony courses that emphasize applying sophisticated harmonic techniques while offering more in-depth education and study of harmonic structures (McFadden, 2010).

Students' experiences learning about harmony in Chinese high schools and colleges are influenced by their

chosen career paths. Harmony education for students interested in classical music studies involves investigating conventional Western harmonic theories and evaluating classical repertoire (Cui, 2021). Conversely, Sun and Neramit-Aram (2022) found that students interested in contemporary popular music frequently receive specialized education in popular harmony, including jazz harmony, pop chord progressions, and improvisation. This finding comes from their study on the influence of jazz on Chinese music. Considering each student's career goals, this professional direction shapes the curriculum and pedagogy. For those students who are interested in this fusion, the curriculum will thus stress the incorporation of jazz elements into Chinese music.

Many chances and obstacles exist for harmony education in Chinese high schools and colleges. The depth of harmonious learning is frequently constrained in high schools by short class periods and a large curriculum (Wang, 2016). A balance must be struck between teaching fundamental ideas and letting students gain useful skills. Additionally, there might need to be more certified educators with a balance of specialized knowledge, resulting in uneven instruction quality (Gao & Xu, 2014). However, high schools have the chance to foster students' interest in harmony and build a strong foundation for subsequent academic endeavors. Meeting students' different needs and interests with varying prior knowledge and expertise is challenging for universities. Many various educational systems, cultures, and life experiences are represented among the students that attend universities. A broad variety of previous knowledge and experience among students may result from this diversity. Tomlinson (2014) found that some students may find adjusting to the more challenging and advanced curriculum difficult, while others may find the pace too slow (Wang & Xie, 2019). However, universities have the chance to offer specialized and thorough harmony education, developing students' highly developed analytical and compositional skills.

Modern harmony textbooks satisfy students' changing needs due to the development of musical techniques and genres. The increased harmonic vocabulary of contemporary music is reflected in these textbooks, including contemporary musical practices and trends (Regev, 2013). They cover a wider range of musical genres, such as jazz, pop, and world music, and they might investigate unconventional harmonic ideas like extended chords, modal harmony, and chromaticism. Modern harmony textbooks have responded to the demand for more inclusive and varied approaches to harmony education. They frequently include examples and case studies from different musical genres and cultures to thoroughly grasp harmony in many circumstances based on Shuker's (2016) results. Additionally, modern textbooks may include multimedia components, interactive exercises, and internet resources to engage students and reflect current learning preferences. Modern musical trends and practices are aligned with contemporary harmony textbooks, which is one of their main advantages. They emphasize the practical application of harmonic concepts in improvisation, composition, and arranging because they understand how important it is to prepare students for real-world musical situations (Sloboda, 2005). To give students current and useful knowledge and abilities, contemporary textbooks frequently discuss harmonic approaches employed in contemporary popular music, jazz improvisation, and electronic music production (Regev, 2013). Although textbooks provide insightful instruction, there may also be drawbacks to using them. Books are often released and then stay static for a while, while music, particularly modern and popular music, is always changing. This implies that by the time a textbook is released, part of the content may already be out of date or may not be accurate in light of the most recent trends and methods in the industry. Additionally, textbooks are often a one-way source of knowledge. They don't provide the engaging, practical learning experiences that certain students would find beneficial, especially in the fields of music production and improvisation, which sometimes call for experimentation and practical application (O'Shea et al., 2021).

The introduction of harmony teaching in primary schools is one area of music education that has attracted attention. Authors such as Chu and Gong who studied mediating role of psychological harmony on primary teachers copying styles and job burnout. Numerous justifications underlie the early adoption of harmony education. According to Peretz (2006) youngsters have an inbuilt preference for harmony, and their musical experiences should align with this preference. Young children can better comprehend how various musical parts interact by being exposed to harmony early on, which will improve their overall musicianship. Early exposure to harmony also lays the groundwork for future musical research. Children's aural abilities enable them to perceive and enjoy harmonies in various musical contexts as they understand fundamental harmonic ideas (Klonoski, 2006). Early harmonic exposure lays a strong foundation for more complex musical abilities like composition and improvisation.

The introduction of harmony instruction in primary schools can have a variety of positive effects on children's musical growth. This first improves their ability to distinguish and appreciate various harmonies and chords. This increased aural awareness lays the basis for more complex musical abilities like sight-reading and improvisation (Klonoski, 2006). Additionally, harmony education supports individuality and creativity. Children learn how to write their musical compositions as they explore and play with harmonies. Their imagination is fostered, and a sense of ownership over their musical works of this process (Isbell & Raines, 2012). Teamwork and social abilities are encouraged via harmony education. Students must listen to one another, coordinate their

efforts, and contribute to the final musical product when participating in collaborative activities like group singing or ensemble performances. Children gain empathy, cooperation, and good communication skills due to these experiences (Campayo-Muñoz & Cabedo-Mas, A., 2017).

While there are clear advantages of integrating harmony education into primary schools, there are also some difficulties and factors to consider. First, fewer certified music educators may be adept at teaching harmony at the primary level. Shuler (1995) asserts that training and professional development opportunities may be necessary to provide teachers with the abilities and information to teach harmonious ideas successfully. Second, age-appropriate curricula and instructional strategies must be properly crafted to interest young students. Students' interest may be maintained, and their knowledge of harmony can be facilitated by ensuring the education is developmentally appropriate, using a range of interactive and play-based activities, and utilizing technology (Walsh et al., 2006). Furthermore, including harmony education in the present curriculum may be logistically difficult. To guarantee that children have a balanced and all-encompassing educational experience, scheduling, resource allocation, and coordination between various topics must be considered (Yusof et al., 2020).

Harmony and acoustics instruction within the classroom is essential to music instruction since it gives understudies a more prominent understanding of musical structures and sound concepts. Understudies can pick up intensive mindfulness of the connections between melodic components and the acoustic qualities of sound by integrating harmony and acoustics in music education. Students develop an understanding of the scientific foundations of music by investigating how harmony is affected by the laws of acoustics (Lindström et al., 2003). Additionally, combining harmony and acoustics enables students to make the connection between abstract ideas and real-world applications. Students can examine how harmonies are built and how various chords and intervals produce emotional reactions. They can experiment with changing harmonies to get the desired results, improving their composing and creative skills (Li, 2021).

Harmony and acoustics can be taught in the classroom using various methods and techniques. Giving pupils a chance to investigate and play with musical elements in real-time improves their comprehension and engagement. According to Wishart's (1996) research, learning experiences can be made more concrete and meaningful by creating and playing modest musical instruments, running experiments with sound waves, and examining the harmonies in popular music. Teaching harmony and acoustics is significantly aided by technology. Students can view and control musical structures and sound qualities using interactive software, virtual instruments, and digital simulations. Students can experiment and freely discover ideas thanks to virtual laboratories and online learning platforms that give them access to various educational materials. Disparities in access can lead to educational inequities, with some students falling behind due to a lack of resources, as not all students have equal access to technology and the internet. Activities that include group collaboration can increase understanding and encourage student participation. Students can actively exchange ideas, examine harmonies with one another, and investigate acoustical phenomena in an environment fostered through group discussions, ensemble performances, and peer-to-peer feedback. Collaboration helps students think critically and improves their capacity to successfully explain and articulate their musical ideas (de Bruin, 2022).

The student's knowledge and abilities in music are significantly impacted by the incorporation of harmony and acoustics in classroom instruction. First, it broadens their theoretical understanding to understand better the components of music's structure and the connection between harmony and acoustics. As performers or composers, understanding improves their analytical abilities and enables them to make wise interpretive decisions (Swanwick, 1994). Teaching harmony and acoustics also enhances pupils' aural perception and listening abilities. Students gain a greater sensitivity to subtleties in timbre, pitch, and sound quality by investigating the acoustical characteristics of various harmonies (Margulis, 2014). They can appreciate and understand music more accurately thanks to their improved aural perception (Parncutt, 2012). Additionally, combining harmony and acoustics encourages students' musical expression and inventiveness. Students can explore various tonalities, chords, and textures in their works by mastering the fundamentals of harmony and acoustics, which broadens their artistic palette and fosters invention (Sangiorgio, 2019).

Teachers are essential to harmony education because they direct students in their musical interests and equip them with the abilities and information to comprehend and value harmony. In harmony education, teachers assist students in navigating the complicated world of harmony by acting as facilitators, mentors, and guides (Pratama et al., 2023). They give pupils a strong theoretical basis by guiding students through comprehending chord progressions, harmonic structures, and tonal relationships (Fisher, 2010). Teachers are essential in encouraging pupils' musical expression and creativity. They engage students to form taught choices in composition, extemporization, and execution by empowering them to investigate and explore with harmonies. Concurring with Campbell and Scott-Kassner's (2018) investigation, instructors can help understudies find their unmistakable melodic voices by offering useful feedback and counsel. This suggests that each learner has the capacity to establish their own unique musical identity, style, or voice. It encourages students to create their own

aesthetic expression within the field of music, going beyond simply learning to play or sing well. Whether a student is interested in mastering a specific instrument, writing their own music, or performing in a particular genre, instructors need to be aware of their musical goals (Tursunbaevna, 2020). The foundation for specialized guidance is this understanding. Teachers too, cultivate an inviting and comprehensive learning environment where students are motivated to require calculated chances and take an interest in gathering vocal exercises. They energize collaborative learning, mindful tuning in, and viable communication among understudies within the classroom (Reeve et al., 2022).

To accommodate various learning styles and improve students' understanding of harmonic principles, teachers can use a combination of visual aids, aural examples, hands-on activities, and technology-based resources (Campbell & Scott-Kassner, 2018). Furthermore, it is essential to incorporate real-world examples and applications. By examining well-known songs, learning about various musical genres, and discussing historical and cultural settings, teachers can connect harmony education and students' musical experiences. This method creates a deeper understanding of harmony and helps students connect theoretical information to their musical interests. Another good educational strategy is individualized instruction. Teachers can offer tailored advice and support since they know each student has varying levels of prior musical experience and expertise. Teachers make sure that all students have the chance to advance and achieve in harmony education by adapting the curriculum to each student's needs (Stronge, 2018).

Music educators need ongoing assistance and professional development to flourish in teaching harmony. Workshops, conferences, and seminars that advance teachers' harmonic knowledge and strengthen their instructional approaches can be considered professional development opportunities. These changes enable teachers to stay current with the most recent findings, invention, and harmony education best practices (Alwadi et al., 2020). Networking and cooperation among music educators are also beneficial. Teachers can discuss ideas, learn from effective practice, and share experiences. Collaboration can create shared materials, lesson plans, and cutting-edge teaching techniques that ultimately harmonize students' education (Alwadi et al., 2020; Stronge, 2018). Collaboration among educators, however, can occasionally result in arguments or differences of opinion. Collaboration may be hampered by disagreements about teaching techniques, curricular selections, or classroom management techniques. Some educators could also be averse to innovation or fresh approaches to instruction. Collaboration efforts may be hampered by this reluctance because it may be difficult to persuade all teachers to accept and use novel ideas (Knapp, 2017). For music educators, administrative support is also essential. The funding of music programs, the availability of time for group planning and professional development, and the promotion of the value of including music education in the curriculum are all things that school administrators can do. Administrators assist in the development of music teachers' careers and the effectiveness of harmony education by creating a welcoming environment (Dillon & Palma, 2018).

3. Methodology

3.1 Theoretical Framework

The study was guided by well-known ideas including constructivism, sociocultural theory, and the zone of proximal development. Constructivism placed a strong emphasis on the active construction of knowledge and understanding by students through relevant experiences and interactions (Amineh & Asl, 2015). The socio-cultural theory emphasizes how crucial social interactions and cultural environments are in determining how people learn and develop. These ideas give the study a theoretical framework through which it may examine the function of harmony instruction in music education and how it affects students' learning and growth.

To ensure the rigour and validity of the findings, the study complied with accepted research standards in terms of quality criteria. The research design was meticulously developed and carried out, using the effective strategies and data collection procedures. Statistical methods for quantitative data and thematic analysis for qualitative data were used. The study included methods like member checking, where participants have the chance to examine and validate the findings, to increase the credibility and trustworthiness of the study. Triangulation, which involves contrasting and comparing results from several data sources, was also used in this study (Ndanu & Syombua, 2015). To ensure transparency and reproducibility, the research also offered a clear and comprehensive description of the research methodology, including the research questions, data gathering protocols, and data analysis tools.

3.2 Sampling Technique

With a sample size of 50, stratified random sampling is a useful research technique. Based on pertinent traits like age, musical ability, or educational attainment, the population is divided into subgroups or strata. To get the appropriate sample size, a proportionate number of individuals from each stratum are chosen at random. This strategy guarantees representation from several subgroups, enabling a more thorough comprehension of how various aspects relate to harmony instruction in music education. By taking into account population variation

and offering insights into the viewpoints of particular subgroups, it improves the validity and generalizability of research findings (Bhardwaj, 2019).

3.3 Data Collection Instruments

The study used a questionnaire and an open-ended comment. The questionnaire assessed participants' views, opinions, and preferences using a five-point scale. This scale's range of replies, from strongly disagree to agree or severely unsatisfied to extremely satisfied, allows for a complete grasp of the participant's opinions on several topics. The questionnaire comprised closed-ended and multiple-choice questions for quantitative data. In the open-ended comment section, respondents might expound on their responses, share personal tales, or provide additional insights that the closed-ended and multiple-choice questions did not cover (Zhou et al., 2017).

3.4 Analysis of Data

This study used quantitative and qualitative data analysis to fully comprehend the research question. SPSS was used to analyze the quantitative data from closed-ended and multiple-choice questions. Descriptive statistics, such as mean score, standard deviation, and percentage, will be generated to describe and interpret the quantitative data (Choi et al., 2020). These findings provided a clear image of the participants' attitudes, opinions, and preferences on a number of topics relating to harmony instruction and music education.

To ensure accuracy and dependability, the thematic analysis entailed a thorough and iterative process of reviewing and developing codes and themes. To identify repeating themes and important linkages, the research examined differences, similarities, and significant areas of interest within the qualitative data. The researcher can make sure that their thematic analysis was accurate and reliable by employing this iterative method of examining, creating, and improving codes and themes. This method made it possible to thoroughly examine the data, showing both recurrent themes and differences in the experiences and viewpoints of the participants. This analysis captured participants' rich experiences and opinions regarding the teaching of harmony and offered in-depth contextual information (Vaismoradi & Snelgrove, 2019).

The research got a deeper grasp of the research question by integrating quantitative and qualitative data analysis methodologies. The qualitative data will offer in-depth insights and capture the intricacies of participants' experiences and perspectives, whilst the quantitative data offered numerical information, such as the prevalence of specific attitudes or beliefs. The study's findings were more valid and reliable thanks to the mixed-methods methodology. Researchers can acquire a complete picture of harmony teaching by using both quantitative surveys or assessments and qualitative interviews or observations. Qualitative data can provide in-depth explanations and context, and quantitative data can reveal numerical trends and patterns. A mixed-methods study, on the other hand, might be time, budget, and manpower heavy. It necessitates knowledge of both quantitative and qualitative research approaches, which may result in increased expenses and complexity (Gabelica et al., 2020).

3.5 Ethics Considerations

Before collecting data, the study received ethical approval from the relevant institutional review board or ethics committee. According to Mikesell, Bromley, and Khodyakov (2013), this approval guarantees that the study complies with ethical norms and safeguards the rights and welfare of the participants. In order to ensure that the research was conducted ethically, the study adhered to the rules and legislation that are applicable to investigations involving human beings. The study took into account the potential advantages and disadvantages for the subjects. The purpose of the study was to learn more about teaching harmony and music education, which may not provide a substantial danger to the participants. The integration of harmony and acoustics in music education was one of the possible advantages, as well as helping to comprehend effective teaching methods. The research took into account the participants' ages and developmental stages, especially when they were children and teenagers between the ages of 12 and 18. It was especially important to make sure that minors' participation was authorized by their guardians. In order to get their support and make sure that parents are aware of and have given their agreement to their children's involvement in the study, the study made sure to maintain a connection with the school principal.

3.6 Informed Consent

In order to protect the rights and privacy of the participants, this study will abide by ethical standards, which are essential in any research involving human beings (Ingham-Broomfield, 2017). All participants, including both previous students and present undergraduates, provided informed consent. The study's objectives, the kinds of questions that were asked, and the expected time commitment for participation were all clearly stated in the participant information sheet or invitation letter that was given to the participants. They were made aware that participation was entirely voluntary and that they might stop at any time without repercussions.

3.7 Confidentiality

A reputable online questionnaire platform with high encryption and privacy settings was employed to safeguard participant confidentiality. All responses will be anonymous in order to maintain confidentiality, and personally-identifying information will be maintained apart from the data collected (Leung & Unal, 2013). This was accomplished by instituting rigorous access restrictions that restricted who created, managed, and accessed survey data. The responses of participants were only accessible to authorized employees. The researcher made sure that the data was securely stored and that only individuals with permission could view it.

3.8 Beneficence and Impact

The field of music education and the creation of efficient teaching methods may benefit from research into harmony teaching and music education. The goal of the study was to get insights into participant attitudes, perceptions, and preferences in order to enhance music instruction practices and build curricula. This has ramifications for those involved in developing music education programs, such as music instructors, curriculum designers, and policymakers. The results of the study can also help us understand how integrating harmony and acoustics into music instruction might improve students' learning opportunities and musical development. This information can assist teachers in creating more creative and successful music sessions that encourage students' musical understanding. In order to address a person's physical, emotional, cognitive, and social needs, music therapy uses music as a therapeutic tool (Marquez-Garcia et al., 2021). Understanding the function of harmony in music education can help explain how individual demands might be catered for in music therapy interventions. The study can offer insightful information that can guide evidence-based practices and improve the standard of music education for students of all ages by developing a thorough understanding of participants' experiences and viewpoints.

4. Findings and Discussion

The information gathered, examined, and evaluated throughout the research process will be clearly and completely described in this part. The researcher responds to the study questions or hypotheses raised in the introduction in this part and explores the consequences of these results in light of the body of literature and ideas already in existence (Lewis & Brookfield, 2021).

4.1 Quantitative Findings

An effective statistical method for analyzing the connection between two or more variables is linear regression analysis (Pal et al., 2019). In this instance, the study demonstrates a statistically significant positive relationship between executive function skill reports and the harmonic education stage. The results of the linear regression analysis show a correlation between the claimed gains in executive function abilities and the level of harmonic instruction (See Figure 1). In other words, those who have made more progress in their harmonic education often see higher improvements in their executive function abilities. Several variables might be responsible for this favourable connection. Mastering harmonic theory and music theory requires a lot of cognitive effort. Individuals are likely to acquire better cognitive skills as they go through various harmonic education levels, which may be used outside of the field of music and help to enhance executive function capabilities (Miendlarzewska & Trost, 2014). For instance, the analytical thinking necessary to grasp intricate musical arrangements could also improve one's ability to solve problems in a variety of real-life scenarios. Additionally, studying music often entails practice, memorization, and performance. These tasks need a great deal of focus and attention to detail. This continued concentration on musical activities may eventually result in a general increase in attention management and cognitive control, two crucial aspects of executive function abilities (Gray & Gow, 2020). This relationship may also be influenced by the emotional and creative components of music education. It may be gratifying and exciting to learn how to play an instrument or comprehend harmonic connections. A person's self-confidence and ability to regulate their emotions may be favourably influenced by music, which indirectly improves executive function abilities (Yumashev et al., 2022). Music also gives people a feeling of success and self-expression. It's crucial to take into account any possible confounding factors that might affect this connection. Executive function skills and harmonic schooling may be impacted by, for example, individual variations in antecedent cognitive talents, socioeconomic situation, or access to educational resources. Individual differences in preceding cognitive abilities, such as working memory, attention management, and cognitive flexibility, can have a substantial impact on a student's capacity to excel in harmonic education. Strong executive function skills are essential for jobs requiring complex cognitive processes, such as music theory, improvisation, and composition (Rosen et al., 2017).

Correlation Matrix

	ID	Start_Time	End_Time
Correlation ID	1.000	.616	.652
Start_Time	.616	1.000	.993
End_Time	.652	.993	1.000

Figure 1. Correlation Analysis

Additionally, the Scree plot analysis (see Figure 2), revealed important data about the research. It is a method for figuring out how many factors or components should be kept in a principal component analysis or factor analysis (Gour et al., 2017). Scree plot analysis helped choose the most important factors to include in a regression model that was used to explain differences in executive function abilities. The research in this example indicated the inclusion of factors linked to the stage of harmonic education and special training as important predictors of variances in executive function. The level of harmonic education and whether participants had received special training were two possible predictor factors that were subjected to scree plot analysis in the particular context of the regression model for executive function abilities. In addition, other demographic factors including age and gender were taken into account. The eigenvalues began to level out with the introduction of the factors associated to the harmonic education stage and special training, according to the scree plot analysis, which originally showed a steep fall in eigenvalues. This discovery has a number of significant ramifications. First of all, according to the scree plot analysis, the factors of harmonic education stage and special training account for a significant amount of the variation in executive function abilities (Slater et al., 2017). After including these factors, the eigenvalues level off, indicating that they have a considerable impact on the model's capacity to explain fluctuations in the dependent variable. According to the scree plot analysis, harmonic education stage and specific training have a substantial influence on executive function abilities, implying a link between musical education and cognitive skills. This comprehension emphasizes the potential cognitive benefits of music instruction. Causation must be established, and individual differences must be addressed. Implications include better educational methods, possible policy support for music programs, and multidisciplinary research into how musical training affects cognition.

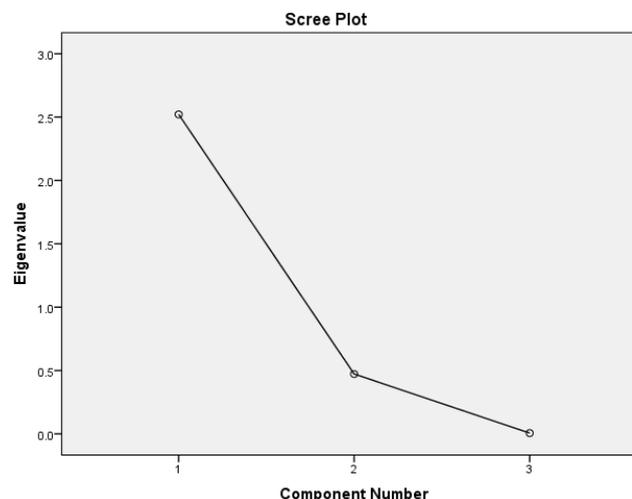


Figure 2. Scree Plot Analysis of Harmonic Education

With its focus on comprehending intricate musical ideas, harmonic instruction probably activates cognitive processes connected to executive function abilities (Sangiorgio, 2019). These abilities could be improved by specialized training, which might include focused cognitive exercises or treatments. This supports the results of other studies that demonstrate the beneficial effects of music instruction and specialized training on cognitive processes. For instance, Dumont et al. (2017) study indicates that music interventions have been shown to improve a number of skills. These findings imply that musical treatments may have additional potential to promote educational processes and child development.

The research validates the acceptability of incorporating age as a determinant variable in some analyses using

Bartlett’s test of sphericity and the KMO test. These tests show that the study’s factor analysis was valid and trustworthy. This indicates that the variables, including age, exhibit enough correlation to support the use of component analysis (See Figure 3). The fact that the variables under consideration are not independent of one another and may be subjected to component analysis is an important first step in establishing the validity of our study.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.585
Bartlett's Test of Sphericity	Approx. Chi-Square	89.066
	df	3
	Sig.	.000

Figure 3. KMO and Bartlett’s Test

The results also show that there is significant intercorrelation among the variables, including age, which further supports the applicability of component analysis. The high KMO value supports the validity of our study by indicating that the data are well-suited for the extraction of underlying components.

Additionally, by using descriptive statistics and scatter plots as analytical tools, researchers were able to learn more about the relationship between these factors. The data points pertaining to early harmony education and its alleged impacts on creativity were graphically depicted via the scatter plots employed in the research (See Figure 4). The pattern and intensity of the link between the two variables are shown in these figures. Larger values of early harmony education are correlated with larger levels of perceived impacts on creativity, indicating a positive association, according to the scatter plot, which also shows a generally rising trend. The scatter plots showed how the data points were distributed around a central line, indicating how strong or weak the association was. Insights into the probable variables impacting the relationship between early harmony instruction and perceived creative impacts were provided by the identification of outliers or unexpected data points (Roof, 2015). Additionally, numerical summaries of the data were supplied using descriptive statistics, which allowed the research to quantify and characterize the association between variables. Measurements including the mean, median, standard deviation, and correlation coefficient were included in this study’s descriptive statistics. While descriptive statistics such as mean, median, standard deviation, and correlation coefficients give useful information, they can bring difficulties. A quantitative knowledge of variable relationships is one of the implications. However, difficulties include the possibility of simplifying of complex data, the risk of missing outliers or non-linear connections, and the necessity for cautious interpretation. Depending entirely on these statistics can result in a restricted grasp of the data’s intricacies. It is also vital to note that, while descriptive statistics are useful, they should be supplemented with qualitative insights and a more in-depth examination to avoid neglecting important aspects and reaching unduly simplified conclusions (Almeida, 2018).

Descriptive Statistics

		Statistic	Bootstrap ^a			
			Bias	Std. Error	95% Confidence Interval	
					Lower	Upper
ID	Mean	11.0000	-.0052	1.3391	8.4310	13.7619
	Std. Deviation	6.20484	-.17728	.61281	4.80975	7.23370
	N	21	0	0	21	21
Start_Time	Mean	07-AUG-202...	.	.	07-AUG-202...	07-AUG-202...
	Std. Deviation	00:49:16.714	- 00:04:08.5...	00:16:30.947	00:07:10.709	01:11:03.311
	N	21	0	0	21	21
End_Time	Mean	07-AUG-202...	.	.	07-AUG-202...	07-AUG-202...
	Std. Deviation	00:50:47.196	- 00:04:10.7...	00:16:46.251	00:09:11.858	01:13:45.368
	N	21	0	0	21	21
REGR factor score 1 for analysis 1	Mean	0E-7	-.0012012	.2097237	-.3597011	.4444048
	Std. Deviation	1.00000000	-.06012048	.26052125	.38711526	1.39092731
	N	21	0	0	21	21

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Figure 4. Descriptive Analysis Findings

The early harmony education arithmetic mean provides insight into the participants' average educational attainment. The comparatively high mean showed a group that had received a lot of exposure to harmony instruction. The average opinion of how harmony education helps to improve creativity was represented in the mean of perceived impacts on creativity. More consistent replies were indicated by the lower standard deviation.

The study's results also show that elementary school is seen as the ideal age for studying music since a large percentage of people perceive and anticipate favourable effects, emphasizing the potential advantages of early exposure to music instruction (Welch et al., 2018). Additionally, a steady reduction in the importance of music instruction as students go through their educational careers may be implied by the drop in its frequency at the undergraduate level.

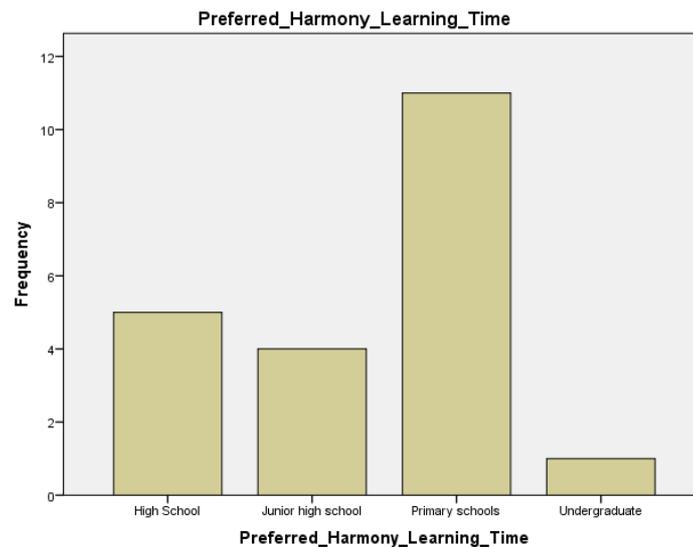


Figure 5. Preferred Harmonic Learning Time

The study's conclusion that primary school is the ideal age to acquire music is consistent with developmental theories that stress the value of early exposure to a variety of learning experiences, including music (Williams, 2018). As their cognitive, emotional, and social development is directly linked to musical experiences, research has revealed that young children are especially susceptible to music instruction. Experiences in the elementary years have a major impact on cognitive development (Ellis et al., 2022). This probably adds to the idea that early exposure to music may have good effects on people's lives in a variety of ways. The difference in how often music is taught between elementary and undergraduate levels provides crucial information about educational goals as students advance in their academic careers. The fact that music education is taught more often in primary schools shows that people are aware of the potential advantages of including music in early schooling. This could be explained by the growing understanding of music's benefits for stimulating creativity, improving cognitive abilities, and encouraging holistic development in children. Parents and educators are more likely to emphasize music instruction throughout these early years as they become aware of these advantages. It's possible that as people advance in their education, their priorities change, as seen by the decline in the frequency of music classes at the college level (Hamond, 2017). This may be the result of a number of things, such as a greater emphasis on specialized areas of study, more demanding coursework, and shifting opinions about the usefulness of music education for advancing one's career (Jääskeläinen, 2023). As people go to higher school levels, there may also be a waning focus on music instruction due to cultural pressures and shifting tastes. These results highlight how crucial it is to provide continued music education opportunities at all educational levels. A consistent presence of music education throughout all educational stages can help prevent the decline in frequency and perceived importance that may happen as a person advances academically, even though the primary level is acknowledged as a crucial time for music education due to its potential long-term benefits (Pitts, 2012).

The study's results also point to a considerable and favourable change in people's perspectives of music education's effects on their lives and their willingness to change. People are becoming more and more open to the advantages of music education as they become aware of how it has a good impact on numerous facets of

their life (Cogdill, 2015). Additionally, this shifting viewpoint is encouraging a readiness to take chances with musically connected educational activities. These results highlight the growing appreciation for the importance of music education and its capacity to promote development and change in individuals.

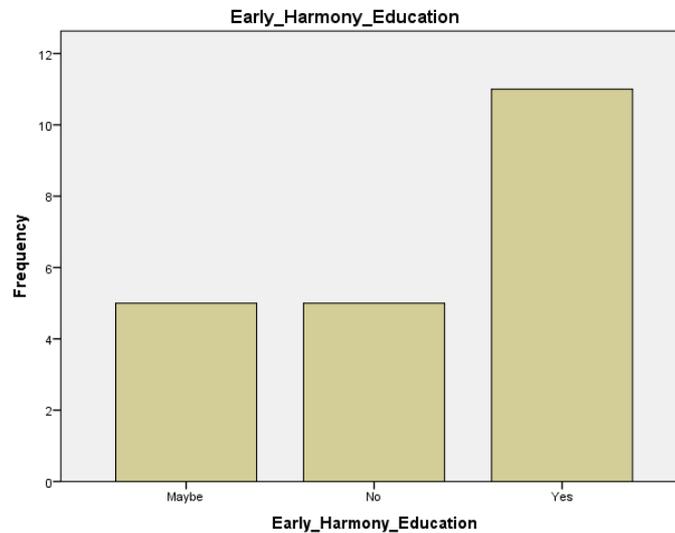


Figure 6. Early Harmony Education

More individuals are recognizing the benefits of music instruction, according to the survey, which is in line with a larger trend in educational research. The advantages of music education for the brain, the heart, and society have been emphasized in several studies. For instance, Schlaug's (2015) study reveals that learning music might alter the brain's anatomical makeup and improve verbal memory and motor abilities. In this survey, a significant percentage of participants agreed on the necessity of early harmonic instruction. This study highlights the perceived importance of beginning music education, particularly harmonic teaching, at a young age. Participants who agree may notice the cognitive and creative benefits of early music exposure, such as greater executive function abilities and musical aptitude (See Figure 6).

However, a lesser proportion of individuals disagree with the concept of early harmonic instruction. Their reservations may be motivated by concerns about overburdening young children with structured learning or by skepticism about the long-term advantages. Furthermore, a far lower proportion of individuals are unsure of the significance of early harmonic education. This ambiguity could be due to a lack of information, differing viewpoints, or the need for further research-based data to reach a firm opinion. The findings illustrate the complexities of ideas on the timing of harmonic teaching and stress the significance of taking multiple perspectives into account when developing music education rules and practices.

In this context, taking a risk on education might include continuing with music education despite difficulties, venturing outside of one's comfort zone to connect with foreign musical ideas, or incorporating music education within a more extensive educational journey. The idea of taking risks in education is consistent with the growth mindset idea, as stated by Smith and Henriksen (2016), where people are more eager to accept challenges and learn from setbacks. This readiness to take chances might promote a more comprehensive and in-depth educational experience.

Intriguing insights into gender variations in views of the timing of music instruction and in the readiness to learn and adapt to changes within the setting of music education are also revealed by the research. Gender disparities in when people perceive music training should begin may occur. Some may advocate for early childhood music education, highlighting the advantages of beginning musical training at a young age, whereas others may claim that it is preferable to begin later, possibly during puberty. Particularly, the results show that a greater percentage of men support starting music instruction earlier in life. Males are also more likely to welcome learning and adjust to changes brought forth by music instruction. The cultural and societal influences that shape views toward music education and education in general are highlighted by these gender-based trends.

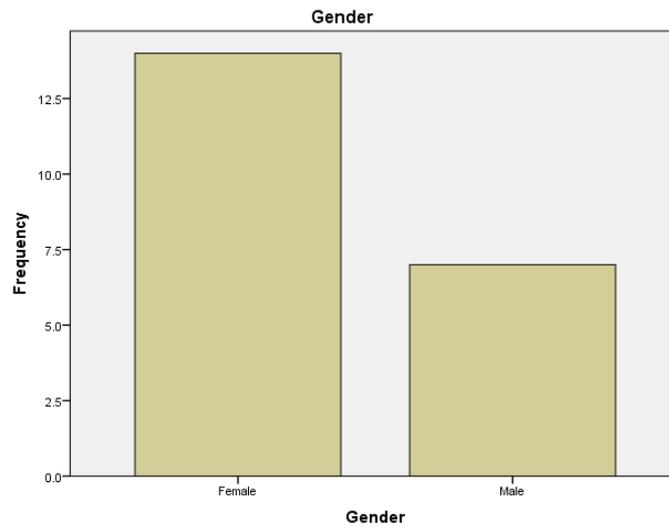


Figure 7. A histogram showing Gender's sentiments on Early Harmony Learning

The finding that more men are in favour of beginning music instruction earlier in life points to a gender-specific viewpoint on when is the best time to start studying music. Cultural norms and gender roles may influence people's expectations and attitudes on when and how to engage in specific activities. Reilly, Neumann, and Andrews (2017) found that cultural and societal factors may affect gender differences in cognitive ability and educational choices (See Figure 7).

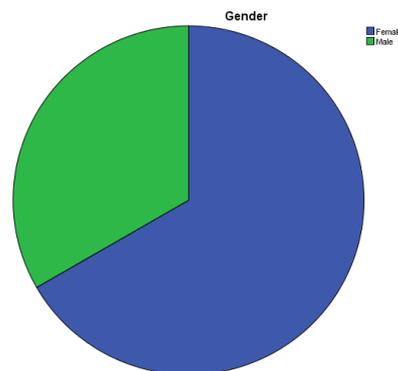


Figure 8. Pie Chart on Gender's preference on harmonic Education

Music training makes men more open to new experiences and engaged in their education, making them more eager to learn and adapt. This is consistent with studies that contend that men may generally be more receptive to new experiences (Fong, 2020). It could also be affected by the idea of a "growth mindset," in which people think they can improve their abilities by working hard and embracing difficulty. Men are more likely to learn and adapt than women, which may reflect men's eagerness to take on novel difficulties like those given by music instruction (Jost et al., 2016). The creation of curricula and instructional methods in the area of music education may be affected by these gender-based results. In designing programs that respond to various gender-related preferences, educators and policymakers might be guided by the knowledge that men indicate a desire for early music instruction (Janurik, et al., 2013). Additionally, taking into account men's increased receptivity to changes brought about by music education might result in customized strategies that take advantage of their interest in experiential learning (Archambault et al., 2019).

4.2 Thematic Findings

In order to encourage cooperation and communication among students in an ensemble like a band or chorus, the first interviewee highlights the significance of harmony instruction. They point out that if a choir has certain members who are unable to sing properly, it affects the general harmony and sounds off. All voices in a chorus must thus work together and pay attention to pitch correctness. This demonstrates the importance of cooperation

and collaboration in achieving a seamless performance. The interviewee also adds that understanding harmony helps with the presentation and development of a work, which improves group musical performances. They point out that a piece's climax depends on harmony's underlying driving power in addition to factors like tone, pace, and vocal volume. Through harmonic shifts, tense or discordant chords, and the overall harmony structure, artists may more effectively convey the piece's climax when they are aware of harmony. This exemplifies how understanding harmony helps musicians perceive and transmit the intended emotions and structure of a song, which improves ensemble performances. Regarding cultural sensitivity, the interviewee says that teachers may use comparison learning to assist pupils in comprehending the cultural relevance and historical context of various harmonic approaches. They advise introducing additional genres including jazz, pop, and Chinese folk music after teaching conventional harmonic tonal harmony. Students may better grasp their cultural surroundings and appreciate the variety of musical expressions by comparing and contrasting different genres. This strategy encourages students to research and appreciate other musical traditions, which fosters cultural awareness. The interviewee's observations therefore provide light on how harmony instruction, in particular, encourages cooperation, teamwork, and cultural awareness among students. Music education encourages a holistic and inclusive approach to musical learning by highlighting the value of collaboration in ensembles, the relevance of harmony in group performances, and the study of various harmonic approaches.

The second interview also shed light on the ways in which music education fosters cooperation, unity, and cultural awareness. The debate about incorporating harmony into the curriculum, the significance of taking into account students' interests, and the development of music education all touch on these subjects. The interview focused on cooperation and collaboration while talking about the integration of harmony into the curriculum. The respondent noted that knowing fundamental music theory and being able to identify intervals and tone names are essential for studying harmony. This suggests that for students to develop these fundamental abilities, they must cooperate and help one another. The interviewee also asserts that harmony is a skill that must be learnt indirectly via preparation exercises like sight-singing and ear training. These activities often require cooperation and collaboration among students via group exercises and ensemble work. The interview also highlighted cultural awareness by talking about various teaching strategies and included a variety of musical genres. The respondent said that even if pupils like a certain harmonic style, instructors should support and promote their inclinations. By respecting many musical traditions and genres, this strategy fosters cultural awareness. The respondent also recommended including jazz, pop, and rock harmony in the curriculum since these genres have rich, varied harmonic content. These genres are included in music instruction, making it more diverse and exposing students to a wider range of cultural expressions. The progress of music education and how it might better serve students' needs were among the topics covered in the conversation. The interviewee emphasizes the value of application and adapting teaching strategies to various majors. This strategy acknowledges that students have a variety of professional options and need certain abilities for their future work. For instance, the interviewee advocates emphasizing piano harmony and improvisation more since they might benefit students' future work. Given that students may need to cooperate with others in their future employment, this progression in music education is consistent with the concepts of cooperation and teamwork. As a result, the interview emphasizes how music education fosters cooperation, unity, and cultural awareness. The idea of incorporating harmony into the curriculum highlights the value of student cooperation and teamwork. Cultural sensitivity is promoted by placing a strong focus on accommodating students' preferences and embracing various musical genres. Lastly, the development of music education to accommodate student demands illustrates the need of cooperation and teamwork in future jobs (Battersby, 2019).

5. Summary and Conclusions

5.1 Conclusion

This research sought to critically assess the impacts of music education and provide suggestions for incorporating music teaching into the larger educational system that was supported by the available data. This research has illuminated its effects and given crucial insights for educators, policymakers, and stakeholders via an in-depth analysis of the advantages and diverse nature of music education. The results of this research have shown a statistically significant positive correlation between executive function skill reports and harmonic education stage as shown in the correlation analysis. Individuals are likely to acquire better cognitive skills as they go through various levels of harmonic education, which may be used outside of the context of music and help to enhance executive function capabilities. This emphasizes how crucial it is to include music education in the curriculum in order to improve cognitive capacities and encourage all-around people. A mixed-methods strategy was used in the research to gather both quantitative and qualitative data. The validity and reliability of the study's results were increased by the combination of quantitative and qualitative data analysis approaches. Throughout the investigation, ethical issues were also taken into account. The study was given ethical clearance, guaranteeing adherence to moral standards and protecting the rights and welfare of the participants. All participants provided informed permission, and confidentiality safeguards were put in place to keep their

information private. In addition to advancing ethical research methods in the domains of harmony training and music education, these ethical norms also safeguard the participants. The research has added to our understanding of how music instruction affects cognitive ability. The research's conclusions and suggestions encourage the integration of formal music education programs into curricula so that future generations of children may experience music's transforming effect in the classroom. The way that music education has changed to accommodate students' requirements shows how crucial it is for future employment to value cooperation, teamwork, and cultural awareness. Policymakers, educators, and other stakeholders may promote the growth of well-rounded people who can flourish in the 21st century by acknowledging the significance of music education and incorporating it into the larger educational system.

5.2 Limitations

There are a number of limitations to the research that need to be noted. Firstly, the study's sample size was rather small. The ability to generalize the results to a wider population may be hampered by the small sample size. Furthermore, since the research was limited to one age group, it may not have adequately captured how music instruction affects people of various ages.

Additionally, to gauge the participants' executive function abilities and opinions on the advantages of music education, the research used self-report measures. Self-report assessments are prone to biases and may not accurately represent participants' true skills or life experiences. In order to offer a more thorough evaluation, future studies may take into account combining objective measures of executive function abilities, such as cognitive tests or behavioural observations.

The possibility that confounding factors might affect how executive function abilities and music education are related is another research disadvantage. Executive function abilities as well as harmonic schooling may be impacted by variables including socioeconomic position, pre-existing cognitive ability, and access to educational resources. Although these factors were attempted to be controlled for, the findings may still be affected by residual confounding.

Additionally, the research did not examine other possible advantages of music instruction, such as emotional well-being or social development, and instead concentrated mainly on the impact of harmonic education on executive function abilities. To give a more thorough picture of the effects of music education, future studies may think about looking at these additional outcomes.

Lastly, the research was carried out in a particular cultural and educational framework, which can restrict the generalizability of the results to other contexts. The impact of music education on cognitive capacities may vary depending on cultural variables, educational institutions, and teaching strategies used in various nations and areas.

5.3 Recommendations

This study's weaknesses may be addressed using numerous research proposals. First, future studies should aim for bigger sample numbers to promote generalizability. It would be possible to get a deeper knowledge of how music education affects executive function abilities across various demographics and age groups with a bigger and more varied sample. This might be accomplished by working with several educational institutions or schools to draw from a wider participant pool.

Future studies should also think about evaluating executive function abilities using a mix of self-report and objective measures. While objective measures like cognitive tests or behavioural observations would provide a more thorough and precise evaluation of executive function abilities, self-report assessments nevertheless offer useful insights into participants' perspectives. The shortcomings of self-report measures, which are vulnerable to biases and cannot accurately reflect participants' true talents, would be solved by using this.

Future research should use stricter control procedures to address the possible confounding factors. According to socioeconomic position, past cognitive aptitude, and availability of educational resources, individuals may be matched in this way. Researchers can more clearly demonstrate a causal link and isolate the effects of music education on executive function abilities by controlling for these factors.

Future studies could also think of using a longitudinal design to look at how executive function abilities are affected over the long run by music instruction. Researchers may better grasp the trajectory of cognitive development and gauge the long-term effects of music instruction by keeping track of individuals over a prolonged period of time. The strongest evidence and the strongest causal link between music education and executive function abilities would come from longitudinal research.

Future studies should attempt to replicate the study in other cultural and educational contexts in order to solve the restriction of cultural context. This would make it possible to comprehend the impacts of music instruction on a wider range of communities and educational institutions. Researchers may find possible cultural influences

on the association between music education and cognitive ability by performing cross-cultural studies.

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Appendix

Hypothesis:

H0: There is no significant relationship between participation in music education and the development of mental, emotional, social, and creative skills among students.

H1: Participation in music education is significantly related to the development of mental, emotional, social, and creative skills among students.

H0: Music education does not contribute significantly to the enhancement of critical thinking, creative problem-solving, effective teamwork, and communication skills among students.

H1: Music education significantly enhances critical thinking, creative problem-solving, effective teamwork, and communication skills among students.

Factor Analysis

Correlation Matrix

		ID	Start_Time	End_Time
Correlation	ID	1.000	.616	.652
	Start_Time	.616	1.000	.993
	End_Time	.652	.993	1.000

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.585
Bartlett's Test of Sphericity	Approx. Chi-Square	89.066
	df	3
	Sig.	.000

The Bartlett's test of Sphericity here is statistically significant with the p-value of less than the 5 % level of significance. It implies that the Correlation and Principal component analysis is allowed to guide the study.

KMO is 0.585 which is positive and it is statistically accepted that the Factor analysis maybe useful with the data.

It indicates the proportion in the values caused by the analyzing factors.

The Harmony teaching education is statistically significant to improve based on the people's values, opinions, age and gender.

Communalities

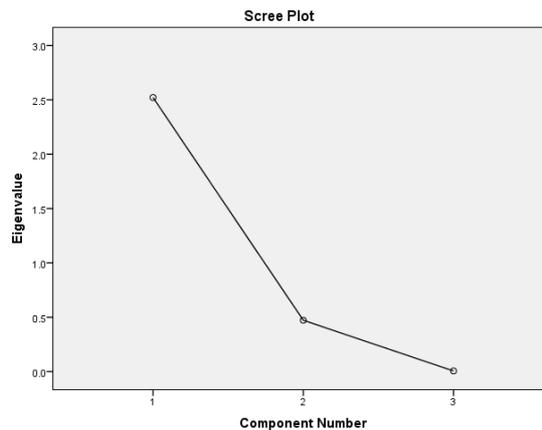
	Initial	Extraction
ID	1.000	.650
Start_Time	1.000	.925
End_Time	1.000	.947

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.521	84.042	84.042	2.521	84.042	84.042
2	.472	15.750	99.792			
3	.006	.208	100.000			

Extraction Method: Principal Component Analysis.



Above is the scree plot (PCA plot) of the variances/eigen values against the principal components.

Before the bend are the factors and variables that carries a lot of values and data for the entire dataset. Implies that the study maybe carried out and represented by only two principal components.

Start and End time could be the Principal components to be retained.

Component Matrix ^a		Component Score Coefficient Matrix		Component Score Covariance Matrix	
	Component		Component	Component	1
	1		1	1	1.000
ID	.806	ID	.320		
Start_Time	.962	Start_Time	.381		
End_Time	.973	End_Time	.386		

Extraction Method: Principal Component Analysis.
a. 1 components extracted.

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
Component Scores.

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
Component Scores.

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	1000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptive Statistics

		Statistic	Bootstrap ^a			
			Bias	Std. Error	95% Confidence Interval	
					Lower	Upper
ID	Mean	11.0000	-.0052	1.3391	8.4310	13.7619
	Std. Deviation	6.20484	-.17728	.61281	4.80975	7.23370
	N	21	0	0	21	21
Start_Time	Mean	07-AUG-202...	.	.	07-AUG-202...	07-AUG-202...
	Std. Deviation	00:49:16.714	- 00:04:08.5...	00:16:30.947	00:07:10.709	01:11:03.311
	N	21	0	0	21	21
End_Time	Mean	07-AUG-202...	.	.	07-AUG-202...	07-AUG-202...
	Std. Deviation	00:50:47.196	- 00:04:10.7...	00:16:46.251	00:09:11.858	01:13:45.368
	N	21	0	0	21	21
REGR factor score_ 1 for analysis 1	Mean	0E-7	-.0012012	.2097237	-.3597011	.4444048
	Std. Deviation	1.00000000	-.06012048	.26052125	.38711526	1.39092731
	N	21	0	0	21	21

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Correlations

		ID	Start_Time	End_Time	REGR factor score 1 for analysis 1		
ID	Pearson Correlation	1	.616**	.652**	.806**		
	Sig. (2-tailed)		.003	.001	.000		
	Sum of Squares and Cross-products	770.000	226138.000	246448.000	100.065		
	Covariance	38.500	11306.900	12322.400	5.003		
	N	21	21	21	21		
	Bootstrap ^c	Bias	0	.026	.040	.030	
		Std. Error	0	.092	.096	.060	
		95% Confidence Interval	Lower	1	.478	.572	.766
			Upper	1	.842	.920	.991
	Start_Time	Pearson Correlation	.616**	1	.993**	.962**	
Sig. (2-tailed)		.003		.000	.000		
Sum of Squares and Cross-products		226138.000	174843163.0	178878679.8	56859.805		
Covariance		11306.900	8742158.148	8943933.988	2842.990		
N		21	21	21	21		
Bootstrap ^c		Bias	.026	0	-.023	-.016	
		Std. Error	.092	0	.080	.053	
		95% Confidence Interval	Lower	.478	1	.688	.770
			Upper	.842	1	1.000	.987
End_Time		Pearson Correlation	.652**	.993**	1	.973**	
	Sig. (2-tailed)	.001	.000		.000		
	Sum of Squares and Cross-products	246448.000	178878679.8	185708095.8	59291.994		
	Covariance	12322.400	8943933.988	9285404.790	2964.600		
	N	21	21	21	21		
	Bootstrap ^c	Bias	.040	-.023	0	-.004	
		Std. Error	.096	.080	0	.015	
		95% Confidence Interval	Lower	.572	.688	1	.937
			Upper	.920	1.000	1	.991
	REGR factor score 1 for analysis 1	Pearson Correlation	.806**	.962**	.973**	1	
Sig. (2-tailed)		.000	.000	.000			
Sum of Squares and Cross-products		100.065	56859.805	59291.994	20.000		
Covariance		5.003	2842.990	2964.600	1.000		
N		21	21	21	21		
Bootstrap ^c		Bias	.030	-.016	-.004	0	
		Std. Error	.060	.053	.015	0	
		95% Confidence Interval	Lower	.766	.770	.937	1
			Upper	.991	.987	.991	1

** . Correlation is significant at the 0.01 level (2-tailed).
 * . Correlation is significant at the 0.05 level (2-tailed).
 c . Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Correlations

		ID	Start_Time	End_Time	REGR factor score 1 for analysis 1		
ID	Pearson Correlation	1	.616**	.652**	.806**		
	Sig. (2-tailed)		.003	.001	.000		
	Sum of Squares and Cross-products	770.000	226138.000	246448.000	100.065		
	Covariance	38.500	11306.900	12322.400	5.003		
	N	21	21	21	21		
	Bootstrap ^c	Bias	0	.026	.040	.030	
		Std. Error	0	.092	.096	.060	
		95% Confidence Interval	Lower	1	.478	.572	.766
			Upper	1	.842	.920	.991
	Start_Time	Pearson Correlation	.616**	1	.993**	.962**	
Sig. (2-tailed)		.003		.000	.000		
Sum of Squares and Cross-products		226138.000	174843162.952	178878679.762	56859.805		
Covariance		11306.900	8742158.148	8943933.988	2842.990		
N		21	21	21	21		

		Bias	.026	0	-.023	-.016
		Std. Error	.092	0	.080	.053
	Bootstrap ^c	95% Confidence Interval	.478	1	.688	.770
		Interval	Upper	.842	1	1.000
		Pearson Correlation	.652**	.993**	1	.973**
		Sig. (2-tailed)	.001	.000		.000
		Sum of Squares and Cross-products	246448.000	178878679.762	185708095.810	59291.994
		Covariance	12322.400	8943933.988	9285404.790	2964.600
End_Time	N		21	21	21	21
		Bias	.040	-.023	0	-.004
		Std. Error	.096	.080	0	.015
	Bootstrap ^c	95% Confidence Interval	.572	.688	1	.937
		Interval	Upper	.920	1	1.000
		Pearson Correlation	.806**	.962**	.973**	1
		Sig. (2-tailed)	.000	.000	.000	
		Sum of Squares and Cross-products	100.065	56859.805	59291.994	20.000
		Covariance	5.003	2842.990	2964.600	1.000
REGR factor	score 1 for N		21	21	21	21
analysis 1		Bias	.030	-.016	-.004	0
		Std. Error	.060	.053	.015	0
	Bootstrap ^c	95% Confidence Interval	.766	.770	.937	1
		Interval	Upper	.991	.991	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Frequency Table

		ID							
		Frequency	Percent	Valid Percent	Cumulative Percent	Bootstrap for Percent ^a			
						Bias	Std. Error	95% Confidence Interval	
								Lower	Upper
Valid	1.00	1	4.8	4.8	4.8	.0	4.7	.0	14.3
	2.00	1	4.8	4.8	9.5	-.1	4.7	.0	14.3
	3.00	1	4.8	4.8	14.3	.1	4.7	.0	14.3
	4.00	1	4.8	4.8	19.0	.2	4.8	.0	14.3
	5.00	1	4.8	4.8	23.8	.1	4.6	.0	14.3
	6.00	1	4.8	4.8	28.6	.1	4.6	.0	14.3
	7.00	1	4.8	4.8	33.3	.1	4.6	.0	14.3
	8.00	1	4.8	4.8	38.1	.0	4.7	.0	14.3
	9.00	1	4.8	4.8	42.9	-.3	4.6	.0	14.3
	10.00	1	4.8	4.8	47.6	-.1	4.6	.0	14.3
	11.00	1	4.8	4.8	52.4	-.1	4.7	.0	14.3
	12.00	1	4.8	4.8	57.1	.1	4.6	.0	14.3
	13.00	1	4.8	4.8	61.9	.1	4.7	.0	14.3
	14.00	1	4.8	4.8	66.7	.0	4.7	.0	14.3
	15.00	1	4.8	4.8	71.4	.0	4.7	.0	14.3
	16.00	1	4.8	4.8	76.2	-.2	4.6	.0	14.3
	17.00	1	4.8	4.8	81.0	.1	4.8	.0	14.3
	18.00	1	4.8	4.8	85.7	.2	4.6	.0	14.3
	19.00	1	4.8	4.8	90.5	-.1	4.5	.0	14.3
	20.00	1	4.8	4.8	95.2	.1	4.6	.0	14.3
	21.00	1	4.8	4.8	100.0	-.1	4.5	.0	14.3
	Total	21	100.0	100.0		.0	.0	100.0	100.0

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Start_Time

	Frequency	Percent	Valid Percent	Cumulative Percent	Bootstrap for Percent ^a				
					Bias	Std. Error	95% Confidence Interval		
							Lower	Upper	
Valid 07-AUG-2023 11:39:07	1	4.8	4.8	4.8	4.8	-.1	4.7	.0	14.3
07-AUG-2023 11:39:20	1	4.8	4.8	9.5	9.5	.1	4.6	.0	14.3
07-AUG-2023 11:40:29	1	4.8	4.8	14.3	14.3	.1	4.7	.0	14.3
07-AUG-2023 11:40:40	1	4.8	4.8	19.0	19.0	.1	4.6	.0	14.3
07-AUG-2023 11:40:55	1	4.8	4.8	23.8	23.8	-.1	4.7	.0	14.3
07-AUG-2023 11:41:04	1	4.8	4.8	28.6	28.6	-.1	4.6	.0	14.3
07-AUG-2023 11:41:28	1	4.8	4.8	33.3	33.3	.0	4.7	.0	14.3
07-AUG-2023 11:41:32	1	4.8	4.8	38.1	38.1	.2	4.8	.0	14.3
07-AUG-2023 11:41:39	1	4.8	4.8	42.9	42.9	.2	4.6	.0	14.3
07-AUG-2023 11:41:54	1	4.8	4.8	47.6	47.6	.1	4.6	.0	14.3
07-AUG-2023 11:42:29	1	4.8	4.8	52.4	52.4	.0	4.7	.0	14.3
07-AUG-2023 11:42:59	1	4.8	4.8	57.1	57.1	-.3	4.6	.0	14.3
07-AUG-2023 11:51:44	1	4.8	4.8	61.9	61.9	.1	4.6	.0	14.3
07-AUG-2023 11:52:48	1	4.8	4.8	66.7	66.7	.0	4.7	.0	14.3
07-AUG-2023 11:53:35	1	4.8	4.8	71.4	71.4	.1	4.7	.0	14.3
07-AUG-2023 11:56:04	1	4.8	4.8	76.2	76.2	-.2	4.6	.0	14.3
07-AUG-2023 11:56:59	1	4.8	4.8	81.0	81.0	.0	4.7	.0	14.3
07-AUG-2023 11:57:10	1	4.8	4.8	85.7	85.7	.1	4.8	.0	14.3
07-AUG-2023 12:13:42	1	4.8	4.8	90.5	90.5	-.1	4.5	.0	14.3
07-AUG-2023 14:16:21	1	4.8	4.8	95.2	95.2	.1	4.6	.0	14.3
07-AUG-2023 14:39:29	1	4.8	4.8	100.0	100.0	-.1	4.5	.0	14.3
Total	21	100.0	100.0			.0	.0	100.0	100.0

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Email

	Frequency	Percent	Valid Percent	Cumulative Percent	Bootstrap for Percent ^a			
					Bias	Std. Error	95% Confidence Interval	
							Lower	Upper
Valid anonymous	21	100.0	100.0	100.0	.0	.0	100.0	100.0

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Age

	Frequency	Percent	Valid Percent	Cumulative Percent	Bootstrap for Percent ^a				
					Bias	Std. Error	95% Confidence Interval		
							Lower	Upper	
Valid 10-18	7	33.3	33.3	33.3	.0	10.1	14.3	52.4	
19-24	10	47.6	47.6	81.0	81.0	-.1	10.7	28.6	71.4
24 or above	4	19.0	19.0	100.0	100.0	.1	8.6	4.8	38.1
Total	21	100.0	100.0			.0	.0	100.0	100.0

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent	Bootstrap for Percent ^a				
					Bias	Std. Error	95% Confidence Interval		
							Lower	Upper	
Valid Female	14	66.7	66.7	66.7	.3	10.5	42.9	85.7	
Male	7	33.3	33.3	100.0	100.0	-.3	10.5	14.3	57.1
Total	21	100.0	100.0			.0	.0	100.0	100.0

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Education_Level

	Frequency	Percent	Valid Percent	Cumulative Percent	Bootstrap for Percent ^a				
					Bias	Std. Error	95% Confidence Interval		
							Lower	Upper	
Valid High school	7	33.3	33.3	33.3	33.3	-.2	10.2	14.3	52.4
Master	1	4.8	4.8	38.1	38.1	.2	4.6	.0	14.3
Undergraduate	13	61.9	61.9	100.0	100.0	-.1	10.3	42.9	81.0
Total	21	100.0	100.0			.0	.0	100.0	100.0

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Teaching_Music_Appreciation

		Frequency	Percent	Valid Percent	Cumulative Percent	Bootstrap for Percent ^a			
						Bias	Std. Error	95% Confidence Interval	
				Lower	Upper				
Valid	Maybe	1	4.8	4.8	4.8	.0	4.7	.0	14.3
	Yes	20	95.2	95.2	100.0	.0	4.7	85.7	100.0
	Total	21	100.0	100.0		-37.0	48.3	.0	100.0

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Enhancing_Musical_Ability

		Frequency	Percent	Valid Percent	Cumulative Percent	Bootstrap for Percent ^a			
						Bias	Std. Error	95% Confidence Interval	
				Lower	Upper				
Valid	No	1	4.8	4.8	4.8	.1	4.6	.0	14.3
	Yes	20	95.2	95.2	100.0	-.1	4.6	85.7	100.0
	Total	21	100.0	100.0		-35.4	47.8	.0	100.0

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Regression

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	1.000 ^a	1.000	1.000	0E-8	1.000	.	3	17	.

a. Predictors: (Constant), End_Time, ID, Start_Time

b. Dependent Variable: REGR factor score 1 for analysis 1

The above is R² of 1.0 which indicates that 100 % proportion of variance in factors (dependent variables) are explained by the independent variable.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.000	3	6.667		^b
	Residual	.000	17	.000		
	Total	20.000	20			

a. Dependent Variable: REGR factor score 1 for analysis 1

b. Predictors: (Constant), End_Time, ID, Start_Time

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-3555835.492	.000		.	.		
	ID	.052	.000	.320	.	.	.511	1.958
	Start_Time	.000	.000	.381	.	.	.013	77.461
	End_Time	.000	.000	.386	.	.	.012	83.507

a. Dependent Variable: REGR factor score 1 for analysis 1

$$Y = -3555835 + 0.052X_1$$

Correlations

		REGR factor score 1 for analysis 1	ID	Start_Time	End_Time
Pearson Correlation	REGR factor score 1 for analysis 1	1.000	.806	.962	.973
	ID	.806	1.000	.616	.652
	Start_Time	.962	.616	1.000	.993
	End_Time	.973	.652	.993	1.000
Sig. (1-tailed)	REGR factor score 1 for analysis 1	.	.000	.000	.000
	ID	.000	.	.001	.001
	Start_Time	.000	.001	.	.000
	End_Time	.000	.001	.000	.
N	REGR factor score 1 for analysis 1	21	21	21	21
	ID	21	21	21	21
	Start_Time	21	21	21	21
	End_Time	21	21	21	21

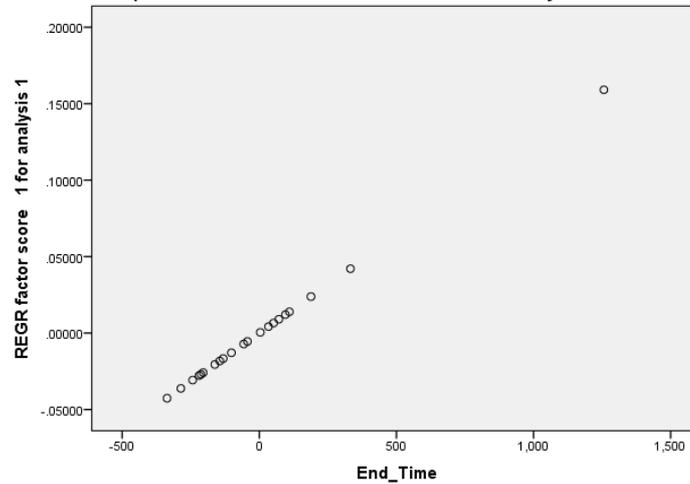
Coefficient Correlations^a

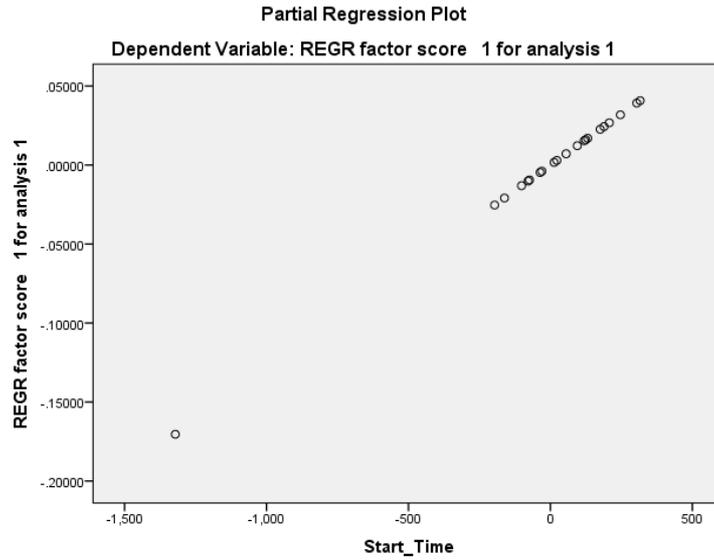
Model			End_Time	ID	Start_Time
1	Correlations	End_Time	1.000	-.420	-.990
		ID	-.420	1.000	.335
		Start_Time	-.990	.335	1.000
Covariances	End_Time	.000	.000	.000	
	ID	.000	.000	.000	
	Start_Time	.000	.000	.000	

a. Dependent Variable: REGR factor score 1 for analysis 1

Partial Regression Plot

Dependent Variable: REGR factor score 1 for analysis 1

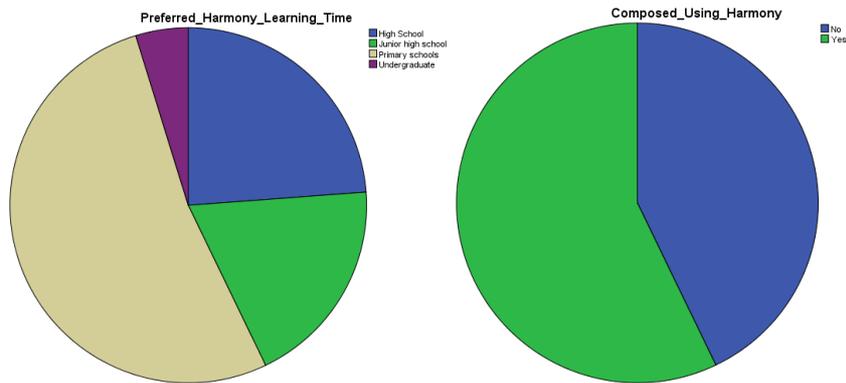


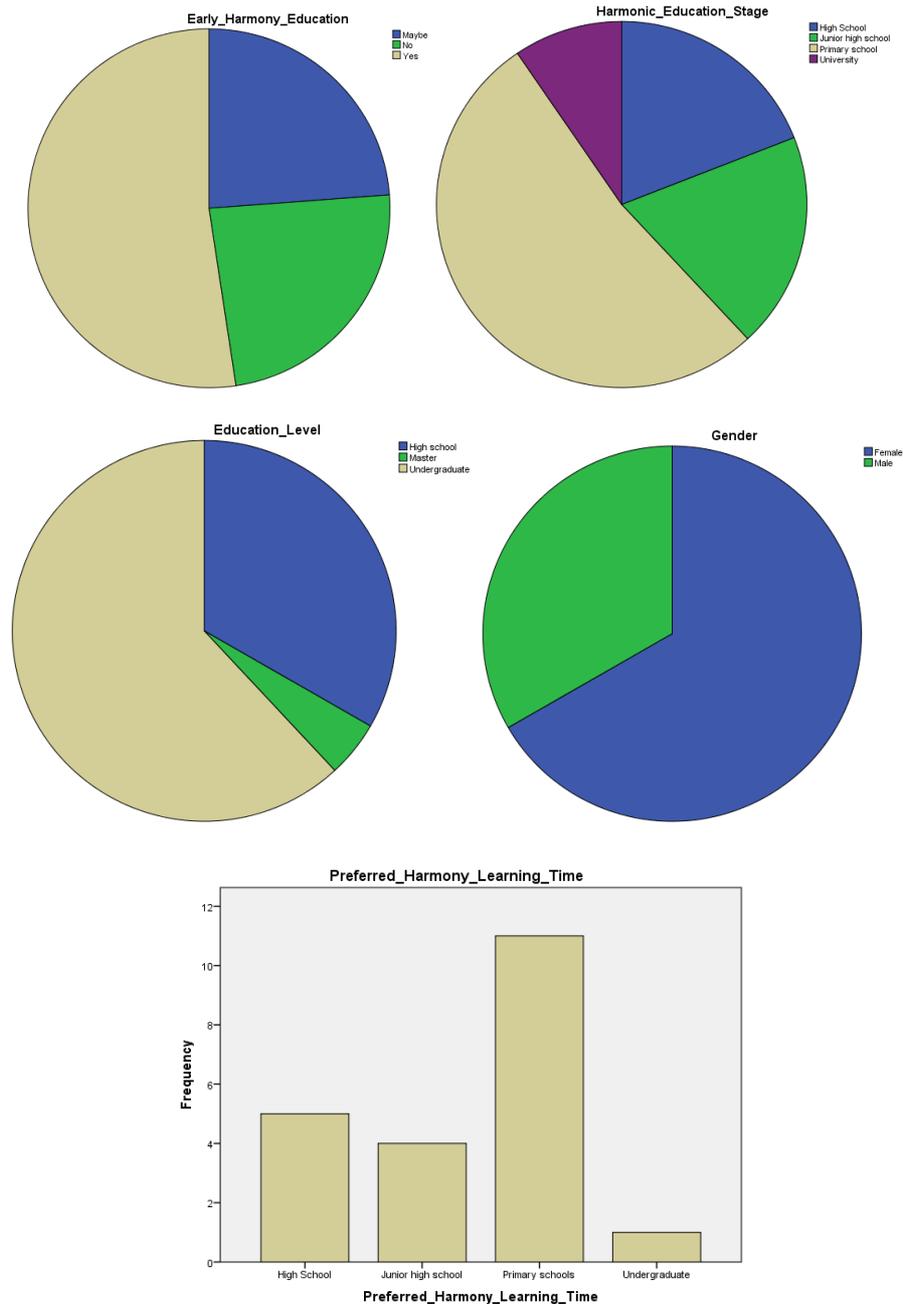


ANOVA

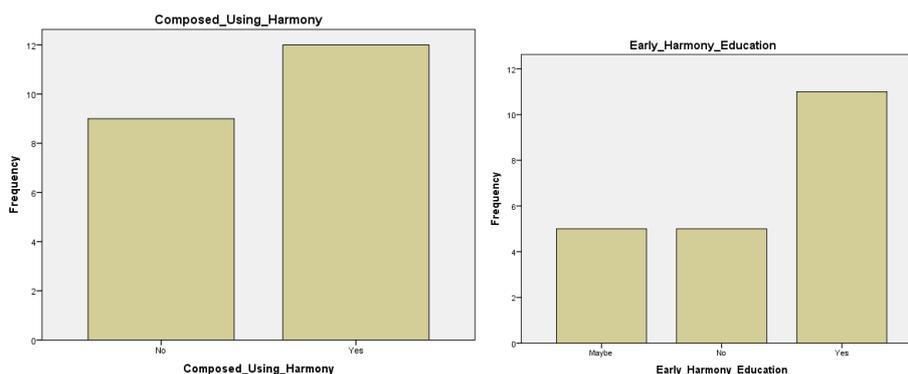
	Sum of Squares	df	Mean Square	F	Sig
Between People	239182514.000	20	11959125.700		
Between Items	2709140738287847600000.000	2	1354570369143923800000.000	450076191380305.560	.000
Within People	120385872.000	40	3009646.800		
Residual	120385872.000	40	3009646.800		
Total	2709140738287968000000.000	42	64503350911618290000.000		
Total	2709140738288207300000.000	62	43695818359487220000.000		

Grand Mean = 9273859395.4286

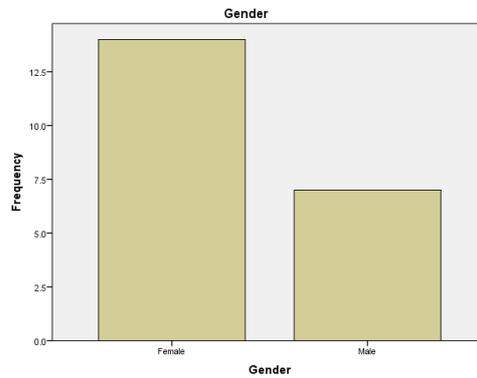




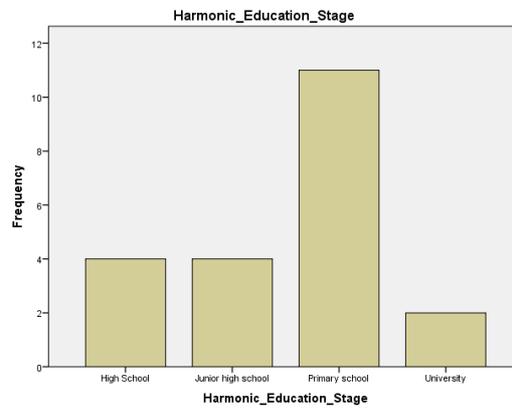
The best time to learn the music is primary level with high population perceiving and conceiving the positive impacts in the lives. High frequency from the Primary schools as compared to lower frequency in Undergraduate level also shows that as the time and people are growing there is the idea of negligence.



More people are into the idea of Music education bringing the positive impact in the entire system of lives. Also, more people are easily impacted by the Music education and their opinions, ideas and their openness to change. More people if thought well are willing to take risk on education.



More males are of the idea that the Music education should be introduced earlier. Males are more willing to learn and adapt to changes from education in Music.



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