

Artistic exploration of national song arrangement through twelve-tone techniques for guitar ensemble: impact on higher education music learning


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ARTICLE INFO

Article history

Received 2025-03-29

Revised 2025-05-25

Accepted 2025-05-31

Keywords

Arrangement

Guitar Ensemble

National Song

Music Education

Twelve-Tone

ABSTRACT

This study addresses a pedagogical challenge in higher education, namely the lack of instructional materials for guitar ensemble courses. This issue has been identified in the Music Department of ISI Yogyakarta, where students encounter difficulties engaging with classical Western music materials due to unfamiliarity, particularly among those without prior training in formal music education or vocational music programs. To mitigate this challenge, arrangements of Indonesian national songs are introduced as a strategic approach, leveraging their familiarity to enhance student engagement and motivation in ensemble practice. This study arranges *Bangun Pemuda Pemuda*, a national song selected for its rhythmic and melodic qualities that lend themselves well to classical guitar ensemble performance. The arrangement employs four distinct voices, mirroring choral harmonization. A key innovation in this arrangement is the incorporation of the dodecaphonic scale, designed to introduce students to modern arrangement techniques, specifically the twelve-tone series. This research adopts an artistic research methodology, encompassing the arrangement process and its implementation in guitar ensemble classes. The qualitative dimension is examined through focus group discussions (FGDs), literature reviews, and classroom observations, fostering dialogue and interaction. This study aims to develop instructional materials that support students in cultivating classical guitar proficiency, ensuring that the applied techniques contribute to their technical advancement while utilizing national songs as an accessible entry point for learning.



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1. Introduction

Ensemble classes serve as a fundamental component of university-level music education, fostering social collaboration and cognitive development. Through ensemble practice, students cultivate synergy, tolerance, and adaptability—skills essential not only for musicianship but also for broader professional and interpersonal growth. Bussu and Mangiarulo [1] assert that participating in a musical ensemble fosters strong interpersonal connections and enhances communication skills. However, effective learning materials remain a crucial factor in facilitating ensemble instruction. Another study by Amburgey [2] highlights that participation in music, especially in an ensemble context, is known to foster learning and social skills while contributing to holistic and well-rounded education. On the other hand, a notable gap exists between the backgrounds of students admitted to ISI Yogyakarta and the pedagogical materials traditionally employed, often resulting in discrepancies in learning expectations between students and instructors. The Music Department at ISI Yogyakarta, as an arts-focused institution, is primarily structured around Western classical music scholarship, encompassing its historical, theoretical, and performative dimensions. In Indonesia, Western music retains an

exclusive and prestigious status, with limited avenues for formal study and career development compared to Western countries. Classical guitar education, in particular, follows Western conservatory models, emphasizing repertoire from composers such as J.S. Bach and Francisco Tárrega. However, in Indonesia, the guitar is more commonly perceived as an accompaniment for traditional songs such as melayu song and also local and western popular music, rather than as a classical solo instrument.

A significant recent development at ISI Yogyakarta has been the increasing openness to admitting students from diverse musical backgrounds, including those whose foundational knowledge does not align with traditional academic standards. Many students struggle with unfamiliar repertoire, composers, and Western notation systems, which are rooted in theoretical frameworks distinct from Indonesia's predominantly aural musical traditions. Additionally, cultural differences in musical cognition—where Western music prioritizes logical structuring and Indonesian musical pedagogy often emphasizes intuitive learning—exacerbate these challenges. To bridge this gap, the author, as an instructor, seeks to develop instructional materials that facilitate effective skill-building, particularly within guitar ensemble courses. Given the complexity and unfamiliarity of Western classical music traditions for many students, theoretical concepts are introduced progressively in classroom instruction. In practical applications, however, students benefit from a repertoire that aligns with their prior musical experiences. Consequently, Indonesian national songs are integrated into the ensemble curriculum as an accessible entry point for learning. From an early age, students in Indonesia engage with national songs, singing them regularly in primary schools and during national celebrations. *Bangun Pemuda Pemuda* was selected for its strong melodic and rhythmic foundations, which lend themselves well to classical guitar arrangement. In an important note by Franz Sartono (2006), the song *Bangun Pemuda Pemuda*, composed by Alfred Simanjuntak, was born from musical talent and a patriotic spirit [3]. Additionally, the song is one of the most widely performed national pieces outside of independence anthems, which tend to have extended durations. Its concise form and structured musical framework provide an ideal foundation for beginner to intermediate learners.

Mainstream music education predominantly adheres to tonal and diatonic traditions, often resisting twelve-tone methodologies. This study seeks to introduce an alternative arrangement approach that incorporates modern twelve-tone techniques within ensemble instruction. The dodecaphonic method grants equal significance to all twelve pitches, diverging from conventional tonal hierarchies. While such arrangements may initially produce dissonant progressions, they contribute to musical diversity and offer philosophical insights, emphasizing that all tones possess the right to be heard. By challenging conventional notions of absolute musical correctness, this study reinforces the idea that music is fundamentally an avenue for artistic freedom and individual expression. Situngkir *et al.* [4] in their research article analyzed the challenges faced by first-year university students in classical guitar courses. The primary difficulties identified were students' inability to read standard notation and their lack of formal training in guitar. The proposed solutions included consultation with senior students and music theory courses. Similar to this study, my research examines the challenges students encounter in practical guitar ensemble classes. However, the key difference is that my study focuses on the ensemble format and implements arrangement strategies as a solution.

Ibrahim & Kadir [5] investigated classical guitar techniques applied to *Nocturne in E-flat Major* by Chopin, originally composed for piano. Their study utilized a case study of classical guitarist Francisco Tárrega, examining the adaptation of piano compositions for guitar performance. This research shares similarities with my study as both focus on technical aspects of classical guitar and employ observation and documentation to analyze performance challenges. However, my study differs in its methodology, as it incorporates a larger student participant group within a structured educational setting. Salman [6] analyzed guitar performance techniques in the works of Andrew York, an American composer from the 20th century. The commonality lies in the selection of a modern or contemporary repertoire as the focal point of analysis. However, Andrew York's compositions still adhere to classical harmonic principles, such as arpeggio-based structures. In contrast, my study explores national songs arranged using a twelve-tone technique, emphasizing a modern approach to arrangement. Sembiring & Widiastuti [7] identified a misalignment in instructional materials for classical guitar courses at Universitas Negeri Medan, finding that the assigned repertoire was too advanced for beginner students. Many students struggled with complex etudes and pieces, necessitating a revision of instructional resources.

My research aligns with their findings in recognizing the inconsistencies in instructional materials. However, the solution proposed in my study is the arrangement of national songs specifically for guitar ensemble classes, ensuring a more accessible and pedagogically appropriate repertoire for student learning. Panggabean & Ferdian [8] examined Mozart's repertoire within musicological studies, highlighting the dominance of Western classical material in higher education curricula. Similarly, Saragih, Soesila, & Ruswanto [9] explored Bach's compositions from a pedagogical perspective, reinforcing the focus on historical European composers in formal music education. While both studies contribute to the analysis of classical works, they primarily focus on traditional repertoire selection without integrating contemporary arrangement approaches into ensemble pedagogy. Supiarza [10] introduced Sibelius software as an analytical tool for arranging Indonesian national songs, specifically *Indonesia Pusaka*. This study aligns with Supiarza's work by emphasizing the importance of national songs in ensemble education, but it diverges in its focus on *Bangun Pemudi Pemuda*, applying twelve-tone techniques to offer a modern interpretative approach. Unlike previous studies that primarily focus on Western classical repertoire and software applications for notation analysis, this research advances the discourse by integrating alternative arrangement methods tailored specifically for ensemble pedagogy. By applying twelve-tone techniques to the arrangement of *Bangun Pemudi Pemuda*, this study challenges conventional harmonic approaches in national song adaptations, providing a fresh perspective on contemporary ensemble instruction. More importantly, it addresses a critical gap in musicology by offering new methodologies for repertoire selection that *balance* technical accessibility, artistic innovation, and pedagogical effectiveness in higher education. This research positions arrangement as a dynamic learning tool, demonstrating its potential to enhance ensemble education, diversify instructional materials, and equip students with broader musical competencies—an area that has been underexplored in existing literature.

2. Method

This study adopts an artistic research methodology within creative arts, integrating personal experience, analytical techniques, and conventional academic research to systematically explore the arrangement process. Borgdorff [11] argues that artistic research can be systematically incorporated into academic discourse through effective publication methods, with "expositions" serving as a key framework for showcasing artistic practice as a form of research. According to Sularso *et al.* [12], academic artists must articulate their techniques in analyzing artistic data, such as visual analysis, stylistic analysis, and comparative analysis, while also conveying their emotional experiences to the audience. This study applies a structured artistic approach, designing an operational framework that includes problem identification, solution formulation, methodological execution, and results evaluation to establish a replicable model for arrangement-based instructional materials in higher education guitar ensembles.

2.1. Operational Research Procedure

The artistic research framework follows a structured operational process, ensuring alignment between conceptual development and practical application in music education. The first phase, exploration and conceptualization, focuses on selecting the song to be arranged and engaging deeply with its musical essence. This involves listening, interpreting melodic and harmonic components, envisioning possible adaptations in an ensemble setting, and identifying artistic elements that evoke meaningful responses. The outcome is the selection of *Bangun Pemudi Pemuda*, chosen for its musical accessibility, rhythmic viability, and cultural familiarity. The second phase, improvisation and structural development, entails experimentation with melodic and harmonic modifications to create the arrangement framework. This includes restructuring harmony by modifying chord progressions, conducting rhythmic trials to explore phrasing and articulation, integrating counter-melodies to develop layered musical textures, and applying dodecaphonic techniques to expand harmonic diversity. The result is a structured arrangement draft that balances conventional and modern musical elements while ensuring pedagogical viability in ensemble education. In the third phase, implementation in ensemble instruction, the arrangement is applied in weekly ensemble classes following structured learning plans. Instructor-led rehearsals guide students through sectional practices, independent skill-building activities encourage mastery of individual parts, and collaborative ensemble synchronization strengthens cohesion. Additionally, specialized software is integrated into practice sessions to enhance accessibility and efficiency. This phase fosters technical precision, interpretative depth, and ensemble coordination among students. The final phase, evaluation

and performance assessment, ensures systematic evaluation of learning outcomes. Focus Group Discussions (FGDs) gather qualitative insights on student engagement and comprehension, classroom observations document challenges and successes in real-time, and comparative reviews analyze student learning experiences against conventional ensemble approaches. This process culminates in a concert presentation, which serves as both a demonstration of pedagogical effectiveness and an opportunity for artistic expression.

2.2. Arrangement Methodology as an Operational Framework

The arrangement methodology follows Miller's [13] framework, adapted to the research context. This includes reimagining the original work in a different style, revising the arrangement for classical guitar ensembles, harmonizing the existing melody into a structured four-part texture akin to choral arrangements, extending motifs for ensemble variation, modifying chord progressions, integrating counter-melodies to enhance musical depth, and refining melodic repetition for structural continuity. This methodological application serves as a replicable model for future arrangement studies, bridging classical traditions with modern ensemble techniques. By employing innovative musical approaches while considering pedagogical practicality, this study provides insights into the creative processes required for effective ensemble education.

2.3. Structured Data Collection and Analytical Framework

To ensure operational effectiveness, the study employs systematic data collection and analytical methodologies. Classroom observations evaluate the effectiveness of the arrangement's implementation, with findings systematically documented. FGDs provide qualitative insights from students regarding learning challenges and adaptation to the arrangement. Additionally, literature reviews contextualize the study within prior academic research on arrangement techniques and ensemble pedagogy. The collected data is analyzed through qualitative interpretation, focusing on identifying recurring themes and patterns. Observational and FGD findings are described in detail and compared with insights from previous studies to highlight both consistencies and novel contributions. This approach ensures a comprehensive perspective that connects theoretical frameworks with practical outcomes. The final step is the structured presentation of results, articulating findings and implications in an academically rigorous format.

3. Results and Discussion

3.1. Technical Aspects of the Arrangement

The arrangement of *Bangun Pemuda Pemuda* within the context of a guitar ensemble is designed to balance accessibility for beginners with technical exploration for advanced students. Structurally, the arrangement is built upon four voices, functioning similarly to a choral format, where each part plays a harmonic role in supporting the main melody (see Fig. 1). Rhythmically, the arrangement incorporates syncopation to enrich the dynamic interaction within the ensemble and to enhance students' engagement with complex rhythmic patterns. The harmonization follows a modal approach, providing flexibility in transitioning between chord progressions. One of the primary innovations in this arrangement is the application of the twelve-tone series (dodecaphonic technique), aimed at introducing students to modern arranging techniques. This approach creates a distinct musical color compared to conventional tonal methods, challenging students to explore new ways of interpreting ensemble material. Additionally, as part of strengthening the instructional structure, the arrangement is transcribed into digital sheet music using Sibelius software, making it easier for students to read notation and understand the relationship between voices within the ensemble. With the combination of these technical elements, the arrangement not only serves as an ensemble exercise but also functions as a pedagogical tool for expanding students' musical knowledge.

BANGUN PEMUDI PEMUDA
gaya modern untuk ansambel gitar
composer: A. Simanjuntak
arr. by Kustap

marcia

Guitar 1

Guitar 2

Guitar 3

Guitar 4.

6

Gtr. 1

Gtr. 2

Gtr. 3

Gtr. 4

11

Gtr. 1

Gtr. 2

Gtr. 3

Gtr. 4

Fig. 1. Excerpt from Arrangement of *Bangun Pemudi Pemuda* from measure 1-15

3.2. Student Responses to the Material

When first introduced, most students encountered challenges in understanding the twelve-tone series technique, as this concept differs from the tonal system they were more familiar with. Interviews and group discussions revealed that some students found the arrangement "unfamiliar" and needed a more gradual instructional approach to improve their comprehension. However, after several practice sessions and collaborative exploration, students' responses to the material showed significant improvement. They began to recognize that each tone in the dodecaphonic technique plays a unique role in shaping musical texture, and they gradually became more comfortable in reading and interpreting notation that does not strictly follow conventional tonal patterns. Moreover, students appreciated the use of a national song as the learning material, as it provided a closer emotional connection to their prior musical experiences. In terms of motivation, there was a noticeable increase in students' active engagement while playing the arrangement, especially as they began to grasp the fundamental principles and applications of the technique. Group discussions indicated that students felt more musically challenged yet motivated, as this approach allowed them to explore more freely compared to traditional ensemble methods. Table 1 categorizes these reflections, offering a structured view of the challenges and improvements students encountered throughout their learning process.

Table 1. Student Testimony

Category	Student Testimony
Understanding the Concept	"At first, the twelve-tone technique felt unfamiliar, but after practice, I started recognizing patterns and understanding how harmony works in this concept."
Technical Challenges	"The syncopation in the arrangement was quite challenging, but sectional practice helped me feel more comfortable following the tempo."
Motivation	"This material made me more motivated to understand modern techniques in guitar ensemble."
Ensemble Coordination	"We initially struggled to synchronize our voices, but after several practice sessions, our performance became more cohesive and structured."
Adaptation to the Arrangement	"Using Sibelius was very helpful in understanding notation and the interaction between voices within the ensemble."

3.3. Evaluation of Performance Before and After Using the Arrangement

To assess the impact of the *Bangun Pemudi Pemuda* arrangement on students' technical and musical development, a qualitative pre-test and post-test evaluation was conducted. Instead of focusing solely on numerical data, this study emphasizes students' reflections, experiences, and evolving perceptions throughout the learning process. By analyzing their responses before and after engaging with the arrangement, patterns emerged regarding their understanding of the twelve-tone technique, technical challenges, motivation, ensemble coordination, and adaptation to the arrangement structure. Table 2 presents a structured comparison, highlighting key areas where students initially struggled and how their perceptions improved over time.

Table 2. Student's Performance Evaluation

Category	Pre-Test (Before Learning)	Post-Test (After Learning)
Understanding the Concept	Students found the twelve-tone technique unfamiliar and difficult to grasp.	Students began recognizing patterns and understanding the application of the twelve-tone technique.
Technical Challenges	Many students struggled to follow chord progressions in the arrangement.	Students became more fluent in reading notation and following chord progressions.
Motivation and Interest	Some students were uncertain about the relevance of this technique.	Students became more enthusiastic about exploring modern arrangement techniques.
Ensemble Coordination	Tempo and synchronization between voices were still unstable.	Ensemble cohesion improved significantly after sectional practice.
Adaptation to the Arrangement	Students were unfamiliar with the modern harmonization approach.	Students felt more comfortable understanding ensemble structure through Sibelius and group discussions.

3.4. Showcase on the Concert Day

Upon completing a 2-credit course in one semester, following the schedule and objectives outlined in the Semester Learning Plan, students undergo an examination in the form of a concert performance on stage. This format allows students to build their confidence in a professional setting in front of an audience. Such experiences are crucial, as research indicates that stage performances are essential for music students to gain valuable insights and experiences that enhance their musicality [14]. Additionally, ensemble experiences foster intersubjective understanding, as highlighted in Swara's study on string ensembles [15]. The arrangement outcomes mark a breakthrough, as the guitar ensemble creates opportunities to perform a wider variety of repertoires, particularly those developed through the applied research designed and executed by the author. The students' practice sessions—individual, sectional, and classroom-based—equip them with the skills needed to deliver on-stage performances. Their coordination demonstrated commendable unity, with attention to dynamics and memorization of parts, despite minor imperfections in execution, particularly in terms of tempo discipline. In this context, the conductor plays a pivotal role in maintaining the flow of the performance (Fig. 2).



Fig. 2. Captured moments from the guitar ensemble concert, led by the author as conductor

The documented performance of *Bangun Pemudi Pemuda* by the guitar ensemble at the end-of-semester concert showcases this journey. Through the research process, spanning practice sessions to the concert, students' skills were accommodated according to their proficiency levels. Beginners, for

instance, were assigned passages without high complexity but still valuable in terms of technical development. This aligns with Garibaldi’s research on designing educational concertos for string ensembles [16]. Although based on a national song, the arrangement and execution aimed to embody an artistic musical style, going beyond a simple four-voice division to include developed sound quality, timbre, and rhythmic elements. Students gained opportunities to explore and refine all these aspects through the *Bangun Pemudi Pemuda* arrangement, transitioning from classroom sessions to the classical guitar ensemble concert held in the Music Department at ISI Yogyakarta. The following table summarizes the key aspects of audience feedback, highlighting both positive impressions and critical perspectives that emerged during the concert.

Table 3 illustrates the varied audience reactions to the guitar ensemble showcase, reflecting the diverse ways listeners engaged with the performance. Many attendees appreciated the unique arrangement and artistic exploration, noting how the performance introduced innovative approaches to ensemble playing, particularly through modern techniques such as twelve-tone composition and non-tonal harmonic structures. These elements, often unfamiliar in traditional ensemble settings, sparked interest among those open to new musical experiences, highlighting the ensemble’s ability to push boundaries in national song arrangements. Audience members who resonated with the approach praised its expressive depth, ensemble coordination, and interpretative clarity, demonstrating the successful execution of the intended artistic vision. However, the performance also elicited critical perspectives, particularly regarding harmonic choices and perceived dissonance. Some audience members expressed difficulty in interpreting the sound textures and harmonic structures, questioning the unconventional nature of the arrangement. Comments such as “Why does the music sound dissonant?” and “The music feels unusual” reflect a gap between audience expectations and the compositional approach employed in the showcase. These reactions underscore a broader challenge in ensemble pedagogy—introducing non-tonal frameworks within educational and performance contexts, where listeners may be more accustomed to tonal stability.

Table 3. Audience Responses to the Guitar Ensemble Showcase

Category	Details
Number of Audience Members	Approximately 100 (students, faculty, and general attendees)
General Impression	The performance was engaging, and the modern guitar ensemble concept was well-received.
Positive Feedback	“The arrangement is unique, an interesting exploration in national music.” – “The ensemble interaction was solid.”
Critical Comments	“Why does the music sound dissonant?” – “The music feels unusual.”
Audience Enthusiasm	High interest, with many attendees intrigued by the techniques used.
Potential for Development	Suggestions for further exploration and refinement of ensemble arrangements.

Despite these differing views, the audience’s high engagement and curiosity were evident throughout the event. The interactive nature of ensemble performances—where each section contributes to the overall musical texture—played a crucial role in bridging artistic interpretation with audience perception. While some listeners found the non-tonal elements challenging, their inquiries and feedback indicate a willingness to engage critically with contemporary arrangement techniques. This highlights the broader educational impact of the showcase, as it not only provided students with real-world performance experience but also facilitated discussions on musical interpretation and audience reception. Looking forward, these responses offer valuable insights into the development of ensemble arrangement strategies, particularly in balancing artistic innovation with accessibility. Further refinement in structural clarity and dynamic contrast could enhance future performances, ensuring that audiences unfamiliar with non-tonal music find entry points for engagement while preserving the ensemble’s explorative artistic vision. Ultimately, the diverse responses reinforce the significance of ensemble concerts as platforms for musical discourse, encouraging both performers and audiences to navigate the evolving landscape of contemporary arrangement techniques.

3.5. Discussions

This section aims to engage in a dialogue between the author's research and other relevant studies in the field. By examining previous scholarly works, the author seeks to establish the position of this study in relation to existing literature and assess how it contributes to ongoing discussions. The analysis not only highlights areas of convergence with past research but also identifies distinct perspectives and methodologies that set this study apart. Through this comparative approach, the

discussion offers insights into how this research responds to previous findings, expands certain concepts, or introduces new frameworks that advance the discourse. By integrating previous studies into the analysis, this section provides a contextual foundation for evaluating the significance of the study's approach, offering a critical reflection on its contribution to the broader academic landscape. Several studies, including those by Volpe *et al.* [17], Glowinski *et al.* [18], and Cho [19], highlight the role of ensemble music in fostering social interaction, resilience, and empathy. These findings align with observations in the guitar ensemble class at ISI Yogyakarta, where collective practice contributed to students' improved coordination, social awareness, and musical engagement. While previous research primarily emphasizes the social benefits of ensemble participation, this study expands the discourse by integrating pedagogical insights, illustrating how ensemble music serves not only as a tool for social interaction but also as a strategic approach for bridging skill gaps among students through structured arrangement techniques.

Additionally, this study builds upon Carrillo & Moreno [20], who advocate for the integration of formal and informal learning strategies in higher education music curricula. By incorporating Sibelius as a notation tool alongside sectional ensemble rehearsals and aural skill development, students engaged in a multi-modal learning process that balanced technical accuracy with creative exploration. Unlike prior research that primarily focused on notation reading and structured interpretation, this study underscores how technological tools and collaborative rehearsal methods contribute to both technical proficiency and musical intuition. Furthermore, studies by Indrawan [21] and Maryanto & Hadi [22] emphasize the importance of enriching instructional materials by developing regional song arrangements for ensemble settings. This study advances that perspective by introducing a modern arrangement approach, adapting the national song *Bangun Pemudi Pemuda* with elements of twelve-tone technique, thereby exposing students to contemporary arrangement methods beyond traditional harmonic structures. The findings also align with Kristerika & Susetyo [23], who argue that variation within ensemble arrangements enhances musical engagement. However, this research extends their premise by incorporating non-tonal principles, broadening both artistic and pedagogical possibilities.

The digital transformation of music education is another key component of this study. Research by Konnov [24], Pramudyo [25], and Saputra [26] affirms that Sibelius is valuable not only for composition but also for music instruction. While previous studies primarily discuss Sibelius as a compositional tool, this research demonstrates its dual function in education, not only as a medium for arrangement but also as an interactive resource that enhances students' understanding of notation, ensemble dynamics, and individual part integration. The study conducted by Marandi *et al.* [27] presents an innovative method for transforming visual elements into music and vice versa, utilizing the mapping of fundamental components such as lines, colors, and curves into musical notation. This research not only focuses on the relationship between shape and sound but also explores music cryptography, employing a twelve-tone equal temperament system as a mechanism to connect music with visual representations. This concept is particularly relevant to ensemble guitar studies, especially in terms of visual comprehension of arrangements and pedagogical approaches in music education. By enabling the visualization of musical structures, this method can be applied in harmonic analysis of ensembles and serve as a teaching tool for introducing twelve-tone techniques to students in higher education settings. The integration of technology, such as Sibelius, which has been used in ensemble guitar studies, can also be enhanced through visual mapping techniques, creating a more interactive and flexible learning model.

Reza [28] examines the classical guitar repertoire *El Folifemo De Oro* by Reginald Smith Brindle, which employs serialism or twelve-tone techniques. His study explores the application of serialism in guitar composition, providing insights into how this method can expand the expressive possibilities of the instrument. While Reza's research is significant in demonstrating the integration of twelve-tone principles into guitar music, my study builds upon this foundation by applying serialism to national songs in a contemporary context, offering a modern perspective on its pedagogical and artistic implications. Salem [29] argues that serialist techniques often carry broader aesthetic and symbolic meanings in musical works, reinforcing the idea that serialism is not merely a compositional system but also a tool for deeper artistic expression. This perspective supports the aesthetic decisions made in this study, particularly in arranging national songs with a twelve-tone approach. Furthermore, Eason [30] highlights Schoenberg's assertion that musical forms can effectively communicate with audiences without relying on traditional tonal functions. This notion aligns with the underlying

principles of my research, which demonstrates how non-tonal compositional strategies can be utilized in ensemble settings to introduce new dimensions in performance and interpretation.

Through this discussion, it becomes clear that while previous studies have explored aspects such as social interaction, instructional strategies, material enrichment, and technological adaptation, this research synthesizes these elements to offer a holistic approach to ensemble education, particularly in the context of skill development through arrangement-based learning. Prior research has demonstrated how specific compositional techniques can expand expressive possibilities in guitar music, and this study builds upon that foundation by applying these methods to national songs in a contemporary setting. Additionally, this approach reinforces the idea that composition techniques serve not only as structural tools but also as aesthetic and symbolic elements, offering broader interpretative possibilities in ensemble practice. Earlier studies have also emphasized that musical form can effectively communicate with audiences without relying on traditional tonal functions, further supporting the importance of exploring alternative strategies in ensemble education. By emphasizing the pedagogical value of ensemble arrangements and integrating modern compositional techniques with technological advancements, this study fills a gap in ensemble teaching methods, introducing new perspectives for advancing music education at the collegiate level.

While this study provides a comprehensive approach to ensemble education through arrangement-based learning, certain limitations should be acknowledged. One key limitation lies in the scope of repertoire selection, as the application of twelve-tone techniques to national songs is relatively specific and may not fully represent broader ensemble practices across different genres. Additionally, while technological integration—such as the use of Sibelius—enhances the learning process, this study does not extensively explore the impact of alternative digital tools or interactive learning platforms that could further support ensemble pedagogy. Future studies could address these gaps by expanding the repertoire beyond national songs to explore serialist techniques in various ensemble settings, including jazz, contemporary chamber music, or even interdisciplinary collaborations with electronic music. Moreover, investigating how digital platforms and AI-assisted composition tools can facilitate arrangement-based learning might provide insights into modern ensemble instruction. Another avenue worth exploring is the psychological and cognitive impact of non-tonal arrangements on student comprehension, examining whether exposure to twelve-tone methods enhances adaptability and creativity in ensemble performance. By considering these aspects, subsequent research can build upon the findings of this study to further refine alternative ensemble teaching methodologies, fostering a more inclusive and technologically adaptive approach in music education.

4. Conclusion

This study offers significant implications for music education, particularly in the context of guitar ensemble learning in higher education. From a pedagogical perspective, the arrangement model developed in this research can serve as a valuable reference for instructors in designing more inclusive and relevant teaching materials, accommodating students with diverse musical backgrounds. Additionally, the exploration of dodecaphonic techniques in national song arrangements contributes to artistic research by opening new avenues for musical innovation and expanding the creative possibilities of Indonesian ensemble arrangements. Furthermore, the integration of this approach into music education curricula could enrich instructional methods, fostering greater student engagement and a deeper understanding of modern arrangement techniques. Despite its contributions, the study has several limitations that should be acknowledged to enhance its validity. One primary limitation is the restricted sample population, as the research was conducted within a single guitar ensemble class at ISI Yogyakarta, which may not be representative of broader educational contexts or other institutions. Additionally, the study does not assess the long-term impact of the arrangement on students' technical and musical development, leaving room for further investigation into sustained learning outcomes. Technical challenges in implementation, such as the adaptation of students to dodecaphonic techniques or difficulties in using Sibelius software, also present hurdles that could benefit from deeper exploration. Building upon this foundation, future research could expand in several directions. A comparative study examining the effectiveness of dodecaphonic arrangements versus traditional methods in ensemble learning could offer valuable insights into pedagogical outcomes. Further quantitative research incorporating pre-test and post-test data could provide empirical evidence of students' skill development following the implementation of the arrangement. Additionally, broadening the scope to explore the application of these techniques in different ensemble

formats, such as percussion ensembles or choral groups, would extend the relevance of the study beyond guitar instruction. Finally, deeper integration with digital platforms could be examined to optimize technology-driven learning, ensuring innovative arrangement methodologies remain accessible and adaptable within contemporary music education.

Acknowledgment

This research and its outputs were facilitated through the support provided by LPPM ISI Yogyakarta. Their role in enabling the implementation of this project is sincerely acknowledged. Further, their dedication to advancing research initiatives has contributed significantly to the achievement of this study's objectives.

Declarations

- Author contribution** : The author is fully responsible for the preparation of this paper.
Funding statement : This research was conducted with financial support from the Research and Community Service Institute (LPPM) ISI Yogyakarta, under grant number DIPA-023.17.2.677539/2022
Conflict of interest : The authors declare no conflict of interest.
Additional information : No additional information is available for this paper.

References

- [1] A. Bussu and M. Mangiarulo, "Playing music together: Exploring the impact of a classical music ensemble on adolescent's life skills self-perception," *PLoS One*, vol. 19, no. 7, p. e0306326, Jul. 2024, doi: [10.1371/journal.pone.0306326](https://doi.org/10.1371/journal.pone.0306326).
- [2] K. Amburgey, "A Bright Point in a Dull Day: A Qualitative Exploration of Middle School Students' Perceptions of Music Ensemble Participation," East Tennessee State University, Johnson City, TN, 2024.
- [3] F. Sartono, "A Simanjuntak Bangunkan Pemuda," *Kompas*.
- [4] R. N. Situngkir, A. Indrawan, and U. Rokhani, "Kendala Mahasiswa Baru dalam Mengikuti Perkuliahan Gitar Klasik pada Tingkat Perguruan Tinggi," *Ekspresi*, vol. 13, no. 2, Nov. 2024, doi: [10.24821/ekp.v13i2.14093](https://doi.org/10.24821/ekp.v13i2.14093).
- [5] M. Ibrahim and T. Handra Kadir, "Analisis Teknik Permainan Gitar Klasik Karya Frederich Chopin: Nocturne In E-Flat Major Op.9 No.2," *J. Sendratasik*, vol. 11, no. 1, 2022, doi: [10.24036/js.v11i1.116243](https://doi.org/10.24036/js.v11i1.116243).
- [6] F. Z. A. Salman, "Analisis Teknik Permainan Gitar Pada Komposisi Gitar Sunburst Karya Andrew York," *Virtuoso J. Pengkaj. dan Pencipta. Musik*, vol. 2, no. 2, 2020, doi: [10.26740/vt.v2n2.p99-105](https://doi.org/10.26740/vt.v2n2.p99-105).
- [7] A. S. Sembiring and U. Widiastuti, "Analisis Bahan Ajar Instrumen Gitar Persiapan Program Studi Pendidikan Musik Universitas Negeri Medan," *Gondang J. Seni dan Budaya*, vol. 2, no. 1, 2018, doi: [10.24114/gondang.v2i1.9761](https://doi.org/10.24114/gondang.v2i1.9761).
- [8] A. J. Panggabean and R. Ferdian, "Bentuk dan Struktur Seksional Musik Rondo 'Alla Turca' Karya WA. Mozart," *Ekspresi Seni J. Ilmu Pengetah. dan Karya Seni*, vol. 25, no. 1, pp. 3–10, 2022. doi: [10.26887/ekspresi.v25i1.3118](https://doi.org/10.26887/ekspresi.v25i1.3118)
- [9] A. O. Saragih, P. Soesila, and Y. Ruswanto, "Analisis Struktur Musik dan Teknik dalam Penyajian 'Partita in A Minor' (BWV 1013) untuk Alto Saksofon," *PROMUSIKA*, vol. 11, no. 2, pp. 82–90, 2023. doi: [10.24821/promusika.v11i2.9476](https://doi.org/10.24821/promusika.v11i2.9476)
- [10] H. Supiarza, "Software sibelius: Eksplorasi Teknik Arransemen Lagu Indonesia Pusaka Karya Ismail Marzuki di Masa Pandemi Covid 19," *Promusika*, vol. 9, no. 1, pp. 1–10, 2021. doi: [10.24821/promusika.v11i1.5296](https://doi.org/10.24821/promusika.v11i1.5296)
- [11] H. Borgdorff, "The Exposition of Artistic Research: Publishing Art in Academia ." Leiden University Press , Leiden , 2020.
- [12] S. Sularso, A. Cahyono, Q. Yu, J. Suranto, Z. Mistortoify, and L. Budhi, "Strategies and techniques for crafting a scientific manuscript for artistic publication: a guide for academic artists in Indonesia," *Int. J. Vis. Perform. Arts*, vol. 6, no. 1, pp. 1–11, Mar. 2024, doi: [10.31763/viperarts.v6i1.1314](https://doi.org/10.31763/viperarts.v6i1.1314).

-
- [13] M. Miller, *Arranging and Orchestra: a note-by-note approach to creating great-sounding arrangement*. Alpha Books, 2007.
- [14] Y. J. Kim and M. K. Song, "Identifying a music-specific virtuoso: Exploratory factor analysis of virtuosos in Korean music," *Psychol. Music*, vol. 52, no. 2, 2024, doi: [10.1177/03057356231186924](https://doi.org/10.1177/03057356231186924).
- [15] L. P. Swara, "Kajian Pengalaman Intersubjektif Personil Parahyangan Orkestra dalam Iklim Integrated Arts Universitas Katolik Parahyangan," *Tonika J. Penelit. dan Pengkaj. Seni*, vol. 6, no. 2, 2023, doi: [10.37368/tonika.v6i2.577](https://doi.org/10.37368/tonika.v6i2.577).
- [16] P. Garibaldi and B. Farant, "Penciptaan Konserto Etude Tangga nada Pentatonik untuk Pembelajaran Violin dan Orkestra," *Resital J. Seni Pertunjuk.*, vol. 22, no. 3, pp. 187–197, 2021. doi: [10.24821/resital.v22i3.6736](https://doi.org/10.24821/resital.v22i3.6736)
- [17] G. Volpe, A. D'Ausilio, L. Badino, A. Camurri, and L. Fadiga, "Measuring social interaction in music ensembles," *Philos. Trans. R. Soc. B Biol. Sci.*, vol. 371, no. 1693, p. 20150377, May 2016, doi: [10.1098/rstb.2015.0377](https://doi.org/10.1098/rstb.2015.0377).
- [18] D. Glowinski, F. Bracco, C. Chiorri, and D. Grandjean, "Music ensemble as a resilient system. Managing the unexpected through group interaction," *Front. Psychol.*, vol. 7, 2016, doi: [10.3389/fpsyg.2016.01548](https://doi.org/10.3389/fpsyg.2016.01548).
- [19] E. Cho, "The relationship between small music ensemble experience and empathy skill: A survey study," *Psychol. Music*, vol. 49, no. 3, pp. 600–614, May 2021, doi: [10.1177/0305735619887226](https://doi.org/10.1177/0305735619887226).
- [20] R. Carrillo and P. A. González-Moreno, "Formal and informal music learning profiles in higher education," *Rev. Electron. Complut. Investig. en Educ. Music.*, vol. 18, 2021, doi: [10.5209/RECIEM.67923](https://doi.org/10.5209/RECIEM.67923).
- [21] A. Indrawan, "Adaptasi Konserto pada Ensambel Gitar sebagai Upaya Pengayaan Bahan Ajar Matakuliah Ensambel," *Resital J. Seni Pertunjuk.*, vol. 16, no. 2, 2015, doi: [10.24821/resital.v16i2.1509](https://doi.org/10.24821/resital.v16i2.1509).
- [22] M. Maryanto and S. Hadi, "Pengembangan-Aransemen Lagu-Lagu Daerah dalam Bentuk Ansambel String," *Pelataran Seni*, vol. 7, no. 1, 2022, doi: [10.20527/jps.v7i1.14038](https://doi.org/10.20527/jps.v7i1.14038).
- [23] A. F. Kristerika and B. Susetyo, "Analisis Aransemen Lagu A Whole New World Ciptaan Tim Rice dan Alan Menken pada Instrumen String oleh Steve Deaprof Band di Pekalongan," *J. Seni Musik*, vol. 9, no. 2, 2020, doi: [10.15294/jsm.v9i2.42266](https://doi.org/10.15294/jsm.v9i2.42266).
- [24] V. P. Konnov, "The Past and Future of Musical Genre in the Violin Concerto by Jean Sibelius," *Университетский научный журнал*, no. 75, 2023, doi: [10.25807/22225064_2023_75_30](https://doi.org/10.25807/22225064_2023_75_30).
- [25] A. Pramudyo, "Aplikasi Musik ' Sibelius ' Sebagai Media Pelatihan Marching Band," *J. Music Educ. Perform. Arts*, vol. 2, no. 1, 2022.
- [26] D. N. Saputra, "Musik Melalui Penggunaan Aplikasi Sibelius," *J. Kaji. Seni*, vol. 06, no. 02, 2020.
- [27] Y. M. H. Marandi, H. Sajedi, and S. Pirasteh, "A novel method to musicalize shape and visualize music and a novel technique in music cryptography," *Multimed. Tools Appl.*, vol. 80, no. 5, pp. 7451–7477, 2021, doi: [10.1007/s11042-020-09962-8](https://doi.org/10.1007/s11042-020-09962-8).
- [28] A. Reza, "El Folifemo De Oro: Sebuah Kajian Musik Gitar Klasik Karya Reginald Smith Brindle dengan Teknik Musik Serialisme," *Beranda*, vol. 1, no. 1, pp. 35–42, Dec. 2023, doi: [10.52969/beranda.v1i1.18](https://doi.org/10.52969/beranda.v1i1.18).
- [29] J. SALEM, "Challenging Historiographic Assumptions: Opening Up Serialism with Pierre Boulez's Don," *Twentieth-Century Music*, vol. 21, no. 3, pp. 363–390, 2024, doi: DOI: [10.1017/S1478572223000130](https://doi.org/10.1017/S1478572223000130).
- [30] A. Eason, "Cadence as Gesture in the Writings and Music of Arnold Schoenberg," *Music Anal.*, vol. 41, no. 2, pp. 266–292, Jul. 2022, doi: [10.1111/musa.12198](https://doi.org/10.1111/musa.12198).
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