



Saw-Bang : Music Wisdom of the Phu-Tai People, in Kuchinarai District, Kalasin Province

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Abstract

Background and Aim: The Saw Bang is a distinctive musical instrument of the Thai people. This study is qualitative research aimed at studying the knowledge and characteristics of the Saw Bang instrument among Phu-Tai.

Materials and Methods: The Data were collected from documents and field observations, with a purposive target group selected. The research utilized interview and observational tools, employed data triangulation to verify information, and employed typological analysis to categorize data. Analytic induction was used to draw conclusions, and findings were presented through descriptive analysis.

Results: "Saw-Bang" (acoustic bamboo fiddle) is made of bamboo. The main components consist of the fiddle header, the fiddle section, the fiddle footer, and a bow. A player will sit cross-legged using a left thumb to support the fiddle's back while using an index finger, a middle finger, a ring finger, and a little finger for playing each note. Moreover, the right-hand holds the bow with the palm facing up. Insert a right ring finger between the bow and horsetail to press the hand's weight against the horsetail while playing. There are two ways of playing Saw-Bang including a traditional style and a general style. In the traditional style, there are two main strings and one secondary string. The main strings must be adjusted to the same note, and the secondary strings must be one step lower note than the main strings. Also, the two main strings have different functions. The first string on the left side of the player acts as the melody string while the middle string is for playing harmonies. Besides, the secondary string on the right side will serve the low melody of the Phu-Tai music performance. For other melodies, the player will press the bow on the two main strings. Another way of playing saw-bang is the general style in which the two main strings have different notes. The main strings' intervals will be set to 4th perfect, and the player will fiddle with only one string. Saw-Bang has three sound setting systems including the same sounding two-string format, the two-string with a different sound format, and the three-string format.

Conclusion: This study serves as a valuable reminder of the cultural wisdom of the Phu-Tai people, who have creatively crafted knowledge in the field of music, specifically regarding this particular instrument. It is crucial, especially for future generations, to preserve and perpetuate this cultural heritage for the benefit of future generations.

Keywords: Saw-Bang; Music Wisdom; Phu-Tai People

Introduction

Folk music holds profound significance in preserving and nurturing the essence of local identity. It serves as a vital link to our cultural heritage, acting as a powerful medium through which individuals can connect with their roots and keep alive the unique narratives, traditions, and customs of a specific region or community (Morrison, 2003). Folk music encapsulates the collective memory of a people, embodying the stories, values, and struggles of generations past. It is a living archive that safeguards the rich tapestry of diverse cultures, ensuring that the distinct identity of a local community is not forgotten or diluted in an increasingly interconnected world. Through its melodies, rhythms, and lyrics, folk music captures the very spirit of a people, reflecting their joys, sorrows, celebrations, and everyday experiences. It is an authentic expression of the collective emotions and aspirations of a community, offering a profound sense of belonging and shared heritage. By passing down oral traditions from one generation to the next, folk music becomes a vessel for preserving ancestral knowledge, wisdom, and the unique cultural practices that have shaped a particular locality (Ramadani, 2017).





Moreover, folk music serves as a counterbalance to homogenization and the loss of cultural diversity that can occur in the face of globalization (Boer et al., 2013). In an era where technology has facilitated the widespread dissemination of popular music, folk music stands as a powerful reminder of the intrinsic value of local traditions and the importance of cultural preservation. It resists the pressures of commercialization and mass production, allowing for the celebration of distinct regional voices, languages, and musical styles. By actively engaging with folk music, communities not only honor their past but also nurture their present and future. It becomes a platform for artistic expression and creativity, fostering a sense of pride and identity among individuals (Lidskog, 2016). For example, folk music festivals, gatherings, and performances become spaces where people come together, share their stories, and strengthen social bonds, fostering a sense of unity and belonging within a community. The Phu-Tai ethnic group, primarily residing in Northeastern Thailand, particularly in areas around Mukdahan, Khamcha-i District, Nakhon Phanom, Kalasin, and Sakon Nakhon, holds a vibrant cultural heritage that encompasses a wealth of distinct elements, including their unique costumes, culinary traditions, customs, and notably, folk music. Additionally, Phu-Tai speakers can also be found in the Khammouane and Savannakhet Provinces of neighboring Laos (Yanpisit, 2022).

The field of musical instruments within the Phu-Tai ethnic group has retained its original form, emphasizing the use of natural materials in their construction. Instruments such as the Pi Phu-Tai, Saw Bang Mai Phai, Khane, and accompanying percussion instruments have preserved their traditional designs. The continued use of natural materials in contemporary times demonstrates the adherence to traditional practices (Dungbung & Nesian, 2020), the authors further discussed that the majority of Phu-Tai musicians who play the traditional musical instrument, including the Phin, are middle-aged males with an average age of 52.4 years. They typically begin learning Thai music from childhood. Notably, the Phin instrument has been recognized as an exceptional musical instrument, with its traditional design being predominantly maintained (Kulnasatian et al., 2022). Additionally, the attire, musical compositions, and language used in Phu-Tai performances signify an obviously strong cultural identity, representing the Phu-Tai ethnic group (Sonsunan & Wongkhamchan, 2021).

Folk music also plays a pivotal role in preserving the local identity of the Phu-Tai community (Pantasri et al., 2020). It serves as an invaluable repository of their collective memory, encapsulating the stories, struggles, and triumphs of their ancestors. Through the melodic tunes, rhythmic patterns, and lyrical compositions of their folk music, the Phu-Tai people vividly express their joys, sorrows, and everyday experiences, providing a glimpse into their rich cultural tapestry. The traditional Phu-Tai folk music reflects the distinctiveness and uniqueness of their cultural traditions. Passed down through generations, this musical heritage serves as a powerful link between the past and the present, fostering a sense of continuity and connection within the community. The melodies and rhythms evoke a strong sense of place, intimately tied to the landscapes, rivers, and natural surroundings that have shaped the Phu-Tai way of life (Dungbung, 2020).

Saw Bang, also known as Saw Mai Phai (Bamboo Saw) and Saw Phu Tai are chordophone musical instruments that hold significant cultural value among the Phu-Tai ethnic group (Pantasri, 2014). These instruments are integral to Phu-Tai traditional performances, which are showcased during various ceremonies, including harvest festivals, weddings, funerals, and other rites associated with the twelve-month traditions of the Isan people. The Saw Bang and Saw Phu Tai play a crucial role in the preservation and expression of the Phu-Tai cultural heritage. These instruments, typically accompanied by the Khane (a bamboo mouth organ) and Pi Phu-Tai (a reed flute), form the musical backbone of Phu-Tai performances (Un-udom et al., 2022). Through their distinctive sounds and melodies, these chordophones evoke a strong sense of identity and tradition, serving as a medium for the Phu-Tai people to connect with their ancestral roots and transmit their cultural legacy to future generations. The Saw Bang and Saw Phu Tai, alongside other elements of Phu-Tai traditional performances, are an integral part of the musical heritage of the Phu-Tai people, encapsulating their history, values, and collective experiences. As such, these musical instruments represent an important aspect of Phu-Tai cultural identity and continue to play a vital role in the preservation and celebration of their rich cultural heritage.



Notably, despite its cultural importance, the scholarly exploration of Saw Bang remains limited, lacking comprehensive academic documentation concerning its physical characteristics, playing techniques, and tonal properties. Consequently, the present study aims to address this scholarly gap by conducting an in-depth investigation of the Saw Bang instrument, systematically examining its appearance, playing methodologies, and acoustic properties. Through this research, it is anticipated that a more comprehensive understanding of Saw Bang will be attained, contributing to the broader academic discourse on the Phu-Tai cultural heritage and facilitating its preservation and appreciation for future generations.

Objective

To investigate the wisdom of Phu-Tai music in Kuchinarai District, Kalasin Province

Scope of the study

1. The scope of the area is in Kuchinarai District, Kalasin Province, a district that is filled with the Phu-Tai ethnic population and rich in Phu-Tai cultural heritage.
2. The scope of study focuses on studying the physical characteristics, playing techniques, and tonal properties of Saw Bang.
3. The scope of a key informant is Mr. Sritud Utto, a Saw Bang artist with more than 40 years of experience with the instrument.

Literature Review

Thuengram (2009) studied the music of the Phu-Tai people in Phonsawan Village, Kaowong District, Kalasin Province. The study reveals a continuous cultural heritage in music that has been passed down from generation to generation. The music of the Phu-Tai people can be divided into three periods. In the first period, Phu-Tai music consisted of instruments such as the Khane, Pi Phu Thai, Saw Bang, and Pi, played during ceremonies. In the second period, Phu-Tai music began incorporating Ching and Chab as rhythmic accompaniments, leading to the emergence of lyrical Lamsongs and more pronounced rhythmic patterns. In the present period, Phu-Tai music has evolved and established itself as a profession, with musical ensembles being formed. However, the preservation of Phu-Tai musical heritage is currently limited to a small group of interested individuals, primarily the elderly and a few younger generations. This decline in interest and popularity of Phu-Tai music among the younger generation suggests a possible disappearance of the art form which is in line with the findings of Puntura (2011), who studied the music of Phu-Tai people in Nong Hang Village, Kuchinarai District, Kalasin Province. The research revealed that the inhabitants of Nong Hang Village led a simple lifestyle primarily centered around agricultural occupations. The music of the Phu-Tai people in Nong Hang Village falls into four categories: string instruments such as the Pi Phu-Tai, wind instruments such as the Khane and Pi, percussions like Konglang, Phanghad, Kongnoi, Konghang, Kabkab, Ching, and Chab. Phu-Tai music in Nong Hang Village is performed in three different contexts: for entertainment within the community, as a welcoming gesture for visitors, and as a means of signaling various ceremonies. The transmission and preservation of Thai music are primarily done through oral tradition, lacking written records. Consequently, younger generations often struggle to comprehend the depth and intricacies of the music and the traditional systems of transmission employed by elder musicians, leading to a limited circle of experienced practitioners.

Kaewpengkor (2008) conducted a study on the traditional wisdom of the village to revive and develop the performance style of Phu-Tai music. The study found that the people of Kalasin Province have various types of musical instruments including string, wind, percussion, and woodwind instruments. The core melodies used in playing are derived from the melodic patterns of "Lai khaen" or "Thang Khaen." These two main melodies are known as "Thang Phu-Tai Noi" and "Thang Phu-Tai Yai." In the past, the Phu-Tai people devised their own musical instruments with simple designs, natural sounds, and soft tones, which were accompanied by the Pi Phu-Tai, known as the "Wong Pi Khan." These findings align with Panpad's (2011) study on the Pi Phu-Tai of Kud Hua Village, Kuchinarai



District, Kalasin Province. The research revealed that the Phu-Tai people consider the Pi as a musical instrument that provides both entertainment and is an integral part of various ceremonies. It is inseparable from the way of life of the Phu-Tai people. Therefore, the Pi Phu-Tai reflects the social and cultural aspects of the Phu-Tai people, such as creating entertainment and fostering unity within the community. It is considered an art form and a form of musical expression for the Phu-Tai people, playing a significant role in their beliefs and ceremonies. It reflects their way of life in the natural environment, and the Pi Phu-Tai signifies the identity of the Phu-Tai people. Based on related documents and research, it can be concluded that the Phu-Tai people possess indigenous wisdom that has preserved their musical culture throughout generations. They have a variety of musical instruments, including string, wind, percussion, and woodwind instruments, which provide both entertainment and play a significant role in various ceremonies. These musical traditions are inseparable from the way of life of the Phu-Tai people. However, the preservation of Phu-Tai musical culture currently relies mainly on a small group of elderly individuals and a few younger generations. This trend suggests a potential decline in the future, following the older generation's passing.

Conceptual Framework

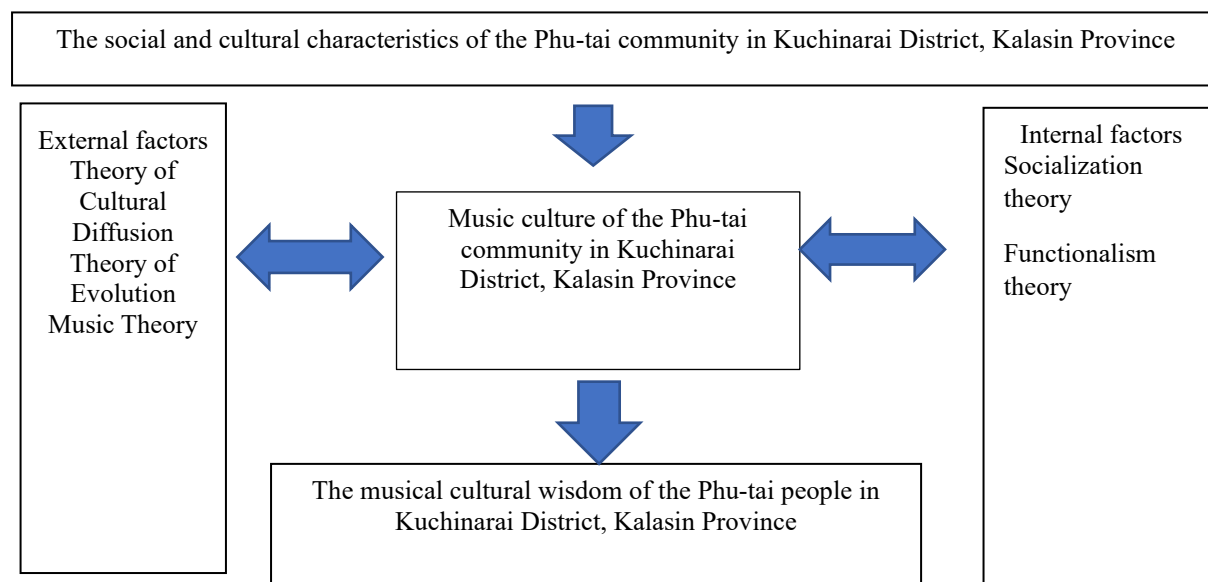


Figure 1. Conceptual Framework of the Study: Musical Cultural Wisdom of the Phu-Tai people in Kuchinarai District, Kalasin Province

Methodology

Research approach: This research utilizes a qualitative research approach and principles of ethnomusicology. It involves data collection from documents and field data in Kuchinarai District, Kalasin Province, a place with documented evidence of longstanding Phu-Tai residents and a rich musical cultural heritage that has been passed down to the present day (Ketthet, 1993). The research employs various research tools such as structured and unstructured interviews, observation, data organization, triangulation, typological analysis, analytic induction, and presentation of research findings through descriptive analysis.

Key Informant: For the purpose of this study, the key informant chosen was Mr. Sritud Utto, a highly skilled artist with over four decades of experience playing the Saw Bang instrument. Mr. Utto, a member of the Phu-Tai ethnic group, resided in Kuchinarai District, Kalasin Province, during the data collection phase. The selection of Mr. Utto as the key informant was based on his personal background as a Phu-Tai individual and his extensive expertise as a Saw Bang artist. The informant's proficiency in both producing and performing the instrument, as well as his ability to effectively





educate others about the intricacies of Saw Bang, were additional factors considered in his selection. By engaging with Mr. Utto, this study aims to gather valuable insights and firsthand knowledge from an authoritative source within the Phu-Tai community, thereby enhancing the depth and reliability of the research findings.

Research Instrument: In order to gather data for this study, three primary research instruments were utilized: a semi-structured interview form, an observation form, and the typological analysis form. The semi-structured interview form was designed to guide the researcher's interaction with the key informant, Mr. Sritud Utto, allowing for open-ended discussions regarding various aspects of the Saw Bang instrument.

Simultaneously, the observation form enabled the systematic documentation of visual and auditory observations during the research process. The researcher carefully observed Mr. Utto's demonstrations and performances, noting details such as hand movements, finger placements, body posture, and other relevant aspects related to playing the Saw Bang instrument.

Furthermore, the Typological Analysis Form was employed as a means of categorizing and analyzing the gathered data. This form facilitated the systematic organization of information pertaining to the appearance, playability, and sound characteristics of the Saw Bang instrument. Through this analytical framework, the researcher could identify patterns, similarities, and unique features in the data, contributing to a comprehensive typological understanding of the instrument.

Data analysis: The data were analyzed using the methods of typological analysis and analytical induction, and the results of the study were presented using the descriptive method.

Results

The findings of the research were analyzed regarding three distinct aspects: the physical qualities, the playing techniques, and the tonal properties. The specifics of each facet are provided below.

Physical characteristics

Material

The Saw Bang instrument comprises a body section constructed from bamboo sticks, typically measuring around 6–5 centimeters in diameter and ranging in height from 15 to 30 centimeters. These bamboo sticks are often divided into sections of approximately 20 to 50 centimeters each. It is customary to utilize bamboo from trees aged at least two years, as this material offers both durability and the desired sound quality.

The instrument's bow, used for producing sound, is also crafted from a bamboo stick. The bow hair, which facilitates sound generation, is typically made of nylon. Within the body section of the instrument, there are wire strings that the player bows to produce sound.

By bowing the strings with the provided bow, the musicians create vibrations that resonate through the instrument's body, resulting in the production of sound. The specific techniques employed by the players in bowing the strings contribute to the instrument's distinctive tonal properties and musical expression.



Figure 2: Show String Knobs, Fiddle, Soundboard, Sound Amplifier, and Rubbing Rubber



Anatomy of Saw Bang

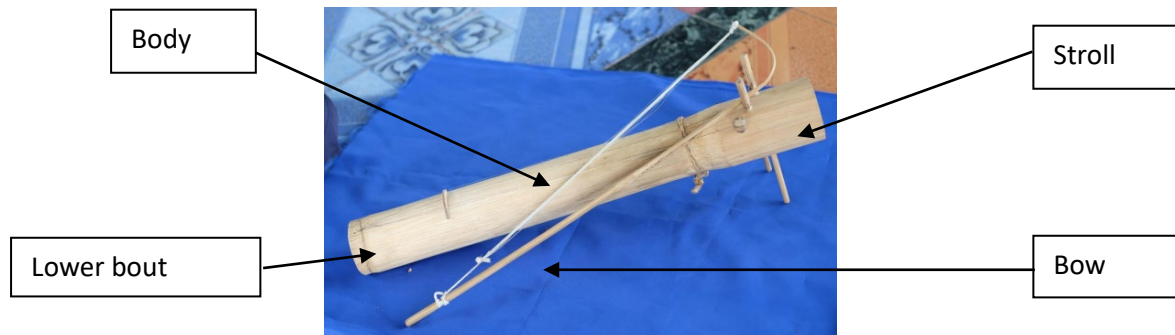


Figure 3 Saw Bang Anatomy

The Saw Bang instrument consists of four primary components: the stroll, body, lower bout, and bow.

The body of the Saw Bang is constructed using bamboo. It serves as the main resonating chamber of the instrument. Attached to the body are two or three strings that run between the lower bout and the stroll. These strings are crucial for producing sound when played. At the stroll, there are tuning pegs that allow for the adjustment of the string tension. These pegs enable the musician to tune the instrument to the desired pitch, ensuring accurate and harmonious sound production. The bow, an essential part of the Saw Bang, is connected to the instrument using nylon material. The bow is utilized to bow the strings within the body, creating vibrations that resonate and produce distinct sounds.

In conclusion, the important physical characteristics of the Saw Bang can be summarized as follows: It consists of a headstock that holds the main strings with tuning pegs. The body is made of bamboo, is slender, and has strings passing through the upper part. There are key elements such as the chest strap, string rest, and sound amplification hole. The tailpiece is used to secure the lower part of the strings, and there is a resin handle used for friction to produce sound when touching the strings.

Playing techniques

To produce sound with the Saw Bang instrument, skilled musicians employ specific playing gestures that contribute to its unique tonal qualities and musical expression. The playing gestures involve a combination of hand movements, finger placements, and bowing techniques.

When playing the Saw Bang, the musician typically holds the instrument with one hand, placing the lower bout against their abdomen for stability. The other hand is used to manipulate the bow and produce sound by bowing the strings. An example of a playing gesture can be seen in Figure 2.

To initiate sound production, the musician positions the bow hair against the strings and applies controlled pressure while moving the bow back and forth. The bowing technique varies depending on the desired tone and musical expression. The musician may employ smooth, continuous bowing motions for sustained notes or shorter, staccato-like bowing for rhythmic passages.

The musician's hand and finger placements on the bow are crucial for achieving different dynamics and articulations. By adjusting the pressure and speed of the bowing motion, the musician can control the volume, intensity, and overall expression of the sound produced by the Saw Bang.

Additionally, the musician may incorporate subtle movements of the fingers on the strings to create variations in pitch, ornamentation, or vibrato effects, enhancing the musical phrasing and adding nuances to the performance.





Figure 4 Playing Gesture

The summary of playing gestures of the Saw Bang bamboo instrument reveals two main playing styles. The ancient style of playing involves two main strings and an additional secondary string. The tuning of the main strings is adjusted to produce the same pitch, while the second string is tuned lower than one of the main strings by a fourth interval (4th Perfect). The general style of playing utilizes two main strings, with each string tuned at a different pitch, creating a perfect fourth interval between them.

Tonal properties

Saw Bang is a chordophone instrument, meaning it belongs to the category of musical instruments that produce sound through the vibration of strings. In the case of the Saw Bang, the sound is generated by the interaction between the bow and the strings. To produce sound with the Saw Bang, the musician applies the bow to the strings, causing them to vibrate. The bow, typically made of a bamboo stick with nylon hair, is drawn across the strings under controlled pressure and speed. The friction between the bow hair and the strings sets the strings into motion, creating vibrations that resonate through the body of the instrument. As the strings vibrate, they transmit these vibrations to the body of the Saw Bang, which acts as a resonating chamber. The body amplifies the vibrations, enriching the sound and giving it a distinct tonal character. The results of the study indicate three tuning systems below.

Dual unison string tuning

The two-stringed Saw Bang instrument features a specific tuning known as "G tuning." In this tuning, both strings are carefully adjusted to produce the note of G. This meticulous alignment ensures that when the musician plays the instrument, both strings resonate together in perfect unison, creating a harmonious and unified sound characterized by the richness and depth of the G note. This consistent and synchronized tuning allows for precise control over the pitch and tonal qualities of the instrument, enabling musicians to create captivating melodies, harmonies, and musical expressions within the framework of the G tuning. Whether playing in unison or exploring melodic variations, the Saw Bang's dual strings tuned to G provide a versatile and resonant foundation for the instrument's distinctive sound.

Dual divergent string tuning

The two-stringed Saw Bang instrument presents a fascinating tuning arrangement known as "Dual divergent string tuning." In this configuration, one of the strings is meticulously tuned to either A^b or G[#], while the other string is precisely set to E^b and D[#]. This deliberate choice of different tones for each string, with a perfect 4th interval between them, results in a captivating and harmonically rich sound palette. The intentional tuning contrast between the two strings enables musicians to explore a diverse range of melodic possibilities and harmonies. The unique interval of a perfect 4th adds an intriguing sense of tension and resolution, creating a dynamic interplay between the two strings. The intervals between the notes played on each string contribute to the complex and evocative nature of the Saw Bang's musical expression.



Table 1. *Dual divergent string tuning*

Line 1							
Test	1	2	3	4	5	Mean	outcome
Tone	G [#]	G [#]	G [#]	G [#]	G [#]		G [#]
Cent	-14	-18	-15.5	-19.5	-16	$-83 \div 5 = -16.6$	783.4
Hz	410	411	412	411.6	410.5	$2055.1 \div 5$	411.02
Line 2							
Test	1	2	3	4	5	mean	Outcome
Tone	D [#]	D [#]	D [#]	D [#]	D [#]		D [#]
Cent	+3	+1	+5	+5	+6	$+20 \div 5 = +4$	304
Hz	311	310	312	312	311	$1556 \div 5$	311.2

Dual unison and divergent string tuning

This triple-string tuning arrangement allows for an intriguing combination of harmonious resonance and contrasting tones. The two strings tuned to the same tone produce a unified and balanced sound, while the third string, tuned to a different tone, adds a distinct and contrasting element to the overall sonic character of the instrument. Two strings are tuned in G while the other is tuned in F. With this configuration, musicians can explore a wide range of melodic possibilities and harmonic textures, incorporating both consonance and dissonance in their musical expression. The interaction between the two unison strings creates a harmonically rich foundation, while the divergent string adds depth and complexity to the overall tonal palette. The dual unison and divergent string tuning of the Saw Bang instrument with its three strings provides a versatile platform for musicians to create captivating melodies, harmonies, and musical arrangements, offering a unique and dynamic sonic experience.

Table 2. *Dual unison and divergent string tuning*

Line 1							
Test	1	2	3	4	5	Mean	outcome
Tone	G	G	G	G	G		G
Cent	-38	-28	-30	-27	-34	$-151 \div 5 = -30.2$	669.8
Hz	383	384	384	383	384	$1918 \div 5$	383.6
Line 2							
Test	1	2	3	4	5	Mean	outcome
Tone	G	G	G	G	G		G
Cent	-27	-31	-29.5	-33	-39	$-159.5 \div 5 = -31.9$	668.1
Hz	384	383	384.5	382	383	$1916 \div 5$	383.2
Line 3							
Test	1	2	3	4	5	Mean	outcome
Tone	F	F	F	F	F		F
Cent	+4	+3	+5	+4	+3	$+19 \div 5 = +3.8$	503.8
Hz	351	349	352	348	348.5	$1748 \div 5$	349.7

In summary, the sound system of the Saw Bang can be grouped into three tuning configurations. The first configuration is the "Dual unison string tuning" style, where both strings are tuned to the same pitch. The second configuration is the "Dual divergent string tuning" style, where one string is tuned to a pitch that is a perfect fourth interval lower than the other string. The third configuration is the "Dual unison and divergent string tuning" style, where the two main strings are tuned to the same pitch, and the third string is tuned to a lower pitch than the main string by one tone.





Conclusion and discussion

In conclusion, the key findings of this study shed light on various aspects of the Saw Bang instrument, providing a comprehensive understanding of its appearance, playing techniques, sound production, and tuning. These key findings collectively contribute to a comprehensive understanding of the Saw Bang instrument, encompassing its appearance, playing techniques, sound production, and tuning. By providing insights into these fundamental aspects, this study enhances our knowledge and appreciation of the Saw Bang's cultural significance and musical heritage. The findings serve as a valuable resource for scholars, musicians, and enthusiasts interested in exploring and preserving the unique musical traditions associated with the Saw Bang instrument.

The study of the Saw Bang instrument provides a valuable glimpse into the lifestyle and cultural practices of the Phu-Tai people residing in the bountiful mountainous regions. Through the examination of this traditional musical instrument, we gain insights into the rich heritage and artistic traditions of these communities. The fact that the Phu-Tai people have developed and cherished the Saw Bang highlights their deep connection with their environment and the abundant resources available to them. The crafting of the instrument from bamboo, a readily available material in their mountainous surroundings, showcases their resourcefulness and ingenuity. The study of the Saw Bang not only unveils the musical traditions but also offers a window into the daily lives and vibrant cultural identity of the Phu-Tai people, who have harmoniously coexisted with the plentiful resources in their mountainous residences. It underscores the importance of recognizing and preserving the cultural practices and heritage of these communities, ensuring that their unique way of life continues to thrive for generations to come (Yanpisit, 2022).

The study also reveals the remarkable ingenuity and resourcefulness of the local community in utilizing materials from their immediate surroundings to create a musical instrument. By employing bamboo, a versatile and abundant resource, the Phu-Tai people demonstrate their deep connection to their natural environment and their ability to craft functional and artistic objects from locally available materials. The resulting sound from the Saw Bang is not only melodic but also carries a distinct identity that is closely related to the Phu-Tai ethnic group. The unique tonal qualities and musical expressions of the instrument reflect the cultural heritage and traditions of the Phu-Tai people, serving as a powerful symbol of their ethnic identity. This is consistent with (Lidskog, 2016) who also claims that the most distinguishing characteristic of folk music instruments is the way in which locals use available materials to create instruments that can imitate the natural noises of the region and be used to create music. The current study thus highlights the profound relationship between the local community and their surrounding environment, showcasing their resourcefulness, creativity, and embodiment of their cultural identity through the melodic sounds of this remarkable instrument.

Recommendation

Practical Recommendations

1. In order to obtain research results that align with this study, the researcher should prepare sound measurement equipment (tuner) capable of measuring the frequency level of two sound systems: the equal temperament system and the cent system. Additionally, the researcher should measure the number of vibrations per second (cycles per second) of the sound, using the unit of Hertz.
2. The researcher should measure the sound level of the Saw Bang when the bamboo material is thoroughly dried to ensure the most stable and consistent sound with optimal resonance.

Further Research Recommendations

1. Further studies should focus on Saw Bang both within and outside the country, such as Saw Bang in Thailand, Laos, Vietnam, etc. Physical characteristics, performances, and sound systems should be a core discussion.
2. There should also be comparative studies of Saw Bang songs among the Phu-Tai people in different regions, both within and outside the country, focusing on melody, rhythm, and various performance techniques.



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