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The impact of changes in scale configuration on the *gangsa* instrument of the Bhavana Ethnic Mataram as an Indonesian music innovation

Gde Agus Mega Saputra [a,1], Galih Suryadmaja [a,2*], Dewi Puspita Ningsih [a,3]

[a] Universitas Nahdlatul Ulama, Nusa Tenggara Barat, Mataram, Indonesia
[1] gdeputra88@gmail.com; [2] galihsuryadmaja@gmail.com *; [3] dewining66@gmail.com
* Corresponding Author

ABSTRACT

The use of traditional instruments in Bhavana Ethnic's musical compositions is one of the innovative aspects of Indonesian music offered. This Indonesian authenticity emerges through the characteristic sounds and drumming patterns that are presented in composing the harmony of the musical works. The innovation in question is the group's efforts to change the composition and configuration of the notes and scales on the *gangsa* instrument. An instrument adopted from the Balinese *gamelan* ensemble. Making adjustments to the reality of traditional music in the creative process. The aim of this research is to explain the importance of innovation in the creative (music) process. Seeing how the Bhavana Ethnic group's perspective understands the reality of tradition in *gangsa* instruments, the idea emerged to change the composition and configuration of the notes in an effort to meet the aesthetic needs in the work. This research was conducted using qualitative methods. Researchers as the main instrument to understand the impact of changes in the tone composition and scale configuration of bronze instruments in natural conditions. The research results are that changes in aspects of the instrument's pitch configuration have implications for changes in the number of tones, pitch range, rules, melodic pattern system, and instrument function in the ensemble. The result of the musical innovation process carried out is that there is a tendency for interval patterns in the selection of tones in each musical creation process. The tendencies for interval patterns in question include the 2- ½ -1- 2 -½ pattern on the major scale, and 1-1- 1½ -1 -1½ on the minor scale.

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1. Introduction

Bhavana Ethnic, a music group from West Nusa Tenggara (NTB) is one of the nominees to win the 2022 Archipelago Music Innovation Competition (Linmtara) organized by the Ministry of Education and Culture. This musical group comes from the city of Mataram, West Nusa Tenggara (NTB), where in its creation process Bhavana Ethnic carries the world music genre. In composing their work, this group is not like most bands which only use modern musical instruments or combos, but also combines ethnic or traditional instruments into it. In terms of instrumentation, this group uses electric guitar, electric bass and drums as a group of modern instruments and combined with several ethnic instruments such as *kendhang*, *tingklik*, *suling* and *gangsa*. As one of the winners of the music innovation competition at the national level, of course there are innovative aspects presented by the Bhavana Ethnic group. Many aspects that can be considered as elements of innovation in Bhavana Ethnic's musical works, such as the use of ethnic instruments in composing musical compositions, are an offer put forward by the group. The use of ethnic or traditional instruments in composing music is a form of Indonesian authenticity through the sound characteristics and playing patterns in each musical

composition played in composing harmony. In the context of using ethnic or traditional instruments, Bhavana Ethnic also makes efforts to update the instruments used. One of the most visible aspects of the innovation process in question is the group's efforts to change the composition and configuration of the notes and scales. Making adjustments to the reality of traditional music in the creative process. The idea of creating an ethnic instrument into a new form then does not change the whole aspect of the instrument. At first glance, the shape of the modified instrument does not show any difference from the original traditional instrument. The change in question is the process of changing the form of a bronze instrument to iron instrument.

In this case, the Bhavana Ethnic group adopted the *gangsa* instrument, an instrument from the Balinese *gong kebyar* ensemble. The choice of this instrument was made because of the group's need to display a strong image of Indonesian music. Where the *gamelan gong kebyar* found in Bali is one of the cultural treasures of the archipelago which is widely known to the wider community through its sound. The instrument basically has a pentatonic scale (*pelog*) which consists of five notes [1]. Due to the needs of the music composition, Bhavana Ethnic changed it to a chromatic diatonic instrument which consisting of 12 notes. The *gangsa* instrument is an ideophone instrument that can be found in Balinese *gamelan* ensembles. An instrument whose sound source comes from blades made of metal, generally bronze. This instrument can be found in several *gamelan* ensembles such as *Semar Pagulingan*, *Angklung*, *Gong Kebyar*, *Gong Gde, Gambang*. In Balinese *gamelan* ensembles, there are at least four types of *gangsa* which are played collaboratively to create a network. In the creative process of the Bhavana Ethnic group, the *gangsa* instrument used is the *gangsa kanthil*. Changes in the composition and configuration of the scales on the instrument are can considered to make it easier for Bhavana Ethnic to compose sounds while maintaining the ethnic image of the *gangsa* character. The character in question is the sound color and beat pattern that emerges from the bronze instrument in each musical composition presented. This is due to the view of this group that it would be quite difficult to combine a combo instrument as a diatonic instrument with the traditional (original) *gangsa* as a pentatonic instrument. Because to play both scales (pentatonic-diatonic) simultaneously, of course a new mode is needed, as was done by Debussy [2].

Changes in the tone composition and scale configuration in the presentation of the *gangsa* instrument in this case will of course be the difference between the traditional *gangsa* and the *gangsa* in the Bhavana Ethnic. Where the reality of instrument in the Bhavana Ethnic group no longer corresponds to what is seen in the reality of the traditional instrument. This instrument, which was previously part of the *gong kebyar* ensemble family, was played together with other groups of traditional instruments, than played together with modern instruments in the Bhavana Ethnic. *Gangsa*, which previously consisted of a 10 tone system, in the Bhavana Ethnic group changed to a 13 tone system. The changes that occur in the *gangsa* instrument of course have implications for other aspects of the game and presentation of the instrument. The impact in question is like changes in technical aspects, playing patterns, instrument functions, and so on, in constructing a musical presentation to continue to bring out the *gangsa* characteristics in a building of sound harmony. Based on this explanation, this research will be limited to the issue of the impact of changing the configuration of the *gangsa* instrument scales with the following formulation; What is the impact of changing the scale configuration on the playing patterns and techniques of the bronze instrument in the Bhavana Ethnic Mataram music group? To answer the problems posed, a textual approach is used as a problem solving step. The innovation on the *gangsa* instrument in this research is seen as a text that can be read [3], [4]. In this instance, by creating a sensible and pertinent framework of thought, academics will give context to the effects of scale configuration alterations as a type of innovation in music [5]. Interpretation of existing phenomena is carried out by presenting data to strengthen the interpretation so that it makes sense. To explain the change in scale configuration from pentatonic to diatonic, it will be explained by looking at the context aspect. This is to understand aspects of the function and purpose of using instruments in the Bhavana Ethnic group which is the basis for generating meaning from the text in the form of interpretations of the innovations that occur.

2. Method

This research was conducted using qualitative methods. Researchers are the main instrument [6], for understanding the impact of changes in the tone composition and scale configuration of *gangsa* instruments in natural term. The partner in this research who will be the data provider is the Bhavana Ethnic group located at Sedap Malam St. No. 1B, Gomong Village, Selaparang District, Mataram City. Involved observations were carried out to explain the phenomena that occurred from the perspective of the Bhavana Ethnic group. Detailed, in-depth and easier to understand descriptions are an effort to understand changes in the context of innovation that occurs [7], [8]. The aim of this research is to explain the implications of innovation on the creative (musical) process. Seeing how the Bhavana Ethnic group's perspective understands the reality of tradition in *gangsa* instruments, the idea emerged to change the composition and tone configuration in an effort to meet the aesthetic needs in the work. In form, what is happening is a form of breakthrough or innovation in music as well as an offer related to the management of traditional music in the future. The exploration carried out by Bhavana Ethnic in this case is a 'courage', considering that the reality of traditional music is full of standard arrangements (*pakem*)[9].

This research has never been carried out before, whether related to formal objects or material objects. Studies regarding changes in scales have previously been carried out on angklung instruments [10]–[12], discussing the process of changing scales as a form of innovation and cultural preservation strategy [13]. The comparative study of the two scales that has been carried out only attempts to see the differences and characteristics of the use of the two scales [14]. There is currently not enough research that specifically discusses *gangsa* instruments. *Gangsa* is always discussed as part of discussions about *gong kebyar* ensembles. The research stages were carried out through data collection by documenting and interviewing sources [15]. The data collection techniques used by researchers in conducting this research were observation or participant observation, in-depth interviews, and literature study. This data collection technique was chosen because researchers need a fairly extensive explanation from informants who have a direct connection with the innovation process in music.

3. Results and Discussion

Understanding the changes in the organological aspects of bronze instruments in the Bhavana Ethnic group is a step to see the changes that occur in the innovation process that occurs. As stated by Mantle Hood, this effort is made by looking at physical aspects and other elements such as techniques or playing patterns of instruments in an ensemble, being an effort to look at the function of instruments, musical functions, decorative techniques, and aspects of their context [16]. Organology is intended to look at aspects of the shape and construction of an instrument in producing sound [17]. In terms of form (physical), the bronze instruments used in Bhavana Ethnic musical compositions are still quite common. It is as if nothing has changed, because the group is trying to maintain its traditional form. The blade used is still made of metal (iron) with a frame made of wood. Although in traditional *gamelan* instruments, blades also use basic materials in the form of bronze and brass, the choice of iron in the Bhavana Ethnic group is more due to the price factor. Where blades made of iron are considered cheaper compared to bronze or brass. It is as if nothing has changed, because the shape or form of the traditional *gangsa* is maintained to construct an 'ethnic' impression on the ensemble elements.

The *gangsa* instrument adopted by the Bhavana Ethnic group is the *gangsa kanthil* instrument found in the traditional Balinese *Gong Kebyar* ensemble. Instruments that previously had *pelog* tunings were changed to instruments with diatonic scales. During the research, it was found that changes to the tone system and scales on *gangsa* instruments had consequences for several aspects and elements of the instrument, although not completely. There are still several elements that are still maintained or remain unchanged. As mentioned organologically, the shape of the instrument and its basic materials have not changed. Another element that is maintained is the use of drumming techniques in the game. The changes as a result of the process of innovation from traditional *gangsa* to modern *gangsa* can be seen from the following Table 1.

Table 1. Changes in innovation from traditional *gangsa* to modern *gangsa*

Indicator	Tradition (pentatonic)	Bhavana Ethnic (diatonic)	Information
Number of Blades	10 Blades	13 Blades	Changed
Number of Tones	5 *Pelog* Tones	12 Chromatic diatonic notes	Changed
Tone Range	2 Octaves	1 Octave	Changed
Rules for Playing	Bound by *Pakem*	Not bound	Changed
Number of Wasp Techniques	2 (*Polos* and *Sangsih*)	2 (*Polos* and *Sangsih*)	Still
Melody Pattern System	10 Patterns	4 Traditional Patterns & 2 Additional Patterns	Changed
Functions in Ensembles	*Gending* Song Presenter	As song content	Changed

The musical innovation carried out by Bhavana Ethnic is an effort to adopt traditional instruments and change the tone system and scales to make it easier to compose music. The convenience aspect in question is to make the instrument more flexible and easier to combine with combo (modern) instrument groups that have a diatonic scale system. The main innovation aspect of the instrument is the change in the tone system and scale configuration. The tone which previously only consisted of five *pelog* (pentatonic) notes arranged in 10 tone bars, changed to 12 diatonic (chromatic) notes in 13 bar arrangements. Changes in the arrangement of the blades on both instruments can be seen Fig. 1.

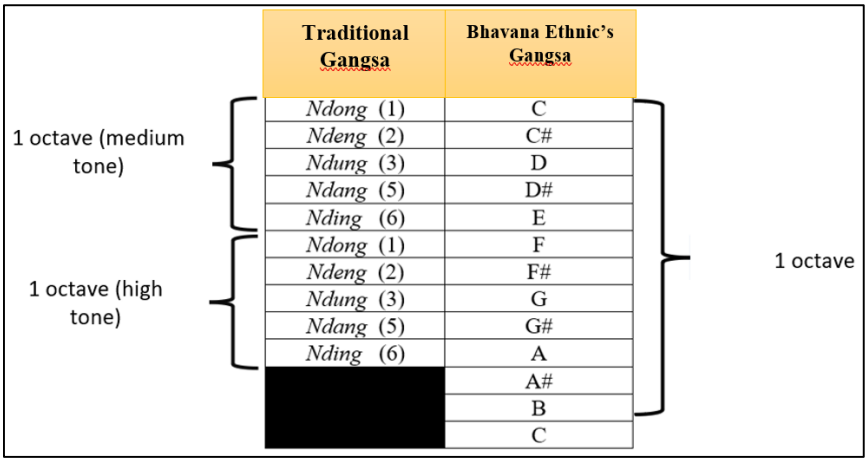

Fig. 1. Comparison of Traditional Bronze Tone Bar Arrangements and Ethnic Bhavana

In Fig. 1, there appears to be a significant change as an implication of the change in scale. In terms of blade arrangement, previously there were only 10 blades, which have changed to 13 blades. At first glance, the shape of the traditional *gangsa* instrument is not much different from the instruments of the Bhavana Ethnic group. Organologically, no part of the instrument appears to have changed. The change from 10 blades to 13 blades has implications for the density of the blade arrangement on the instrument. Where the arrangement of the blades on the bronze instruments of the Bhavana Ethnic group tends to be tighter than the original instruments. The increase in the number of blades from 10 to 13 does not mean that the range of notes produced is higher than on traditional bronze instruments. In the observation and seen in the picture above, the range of notes on the Bhavana Ethnic group's *gangsa* instruments is lower or fewer, or appears to be reduced when compared to traditional *gangsa* instruments. On the traditional 10-bar instrument, the *gangsa* instrument has a composition of low notes and high notes. Based on their arrangement, the ten tone bars in traditional *gangsa* can span as many as two octaves from low 1st note (*ndong*) to high 6th note (*nding*) as seen in Fig. 1. Meanwhile, the Bhavana Ethnic group's *gangsa* instruments appear to only be able to cover one octave consisting of just one scale arrangement, Fig. 2 is a Photo of the *Gangsa* Bhavana Ethnic Instrument. This is different from traditional instruments, where the drummer (player) will always be bound by the rules in playing the *gangsa* instrument. The rules in question are the standards that have been established in playing an instrument. Like every bronze instrument, it can only be played by one player or drummer in one ensemble group. Then the layout or game patterns already

have standard rules that must be obeyed by the players. When playing bronze instruments in the Bhavana Ethnic group, players are not bound by the traditional standards of the instrument they come from. Players are free to explore existing bronze instruments. This is because the *gangsa* instruments of this group are no longer part of the community's traditions. Rather, it has become an entity belonging to the community, which will live in accordance with community agreements.

Fig. 2. Photo of *Gangsa* Bhavana Ethnic Instrument

Another implication of the changes that occur is a change or shift in the function of the instruments in the ensemble group. *Gangsa Kantil* in the traditional *gong kebyar* ensemble is used to work on pieces with various kinds of *cengkok* [4], [18]. The instrument in the presentation displays the melodic elements of the main song in the composition of the piece. Through the chanting of the notes on the instrument, a person can identify and interpret the piece or song that is being played. This function then experienced a shift when the instrument was adopted by the Bhavana Ethnic group in composing their songs. The bronze instrument in the Bhavana Ethnic group is no longer a main part of a musical performance or song as is the case with traditional instruments. In the game, the *gangsa* in this group no longer plays the melody or song in its entirety for each musical composition presented. *Gangsa* is no longer the main or main part in the production of each song. Bronze in the Bhavana Ethnic group is only used as filling in song composition. This instrument is not played from the beginning to the end of the performance, or even used to interpret the course of the piece. The function of the *gangsa* instrument in the Bhavana Ethnic group is limited to 'song filling', namely to fill several parts of the song composition, such as the intro, chorus and outro of the song. *Gangsa* is played according to the taste of the composer in constructing each song or musical work. In each song that is composed, the portion of the *gangsa* game looks different. In one song, perhaps the *gangsa* playing will seem dominant, but in other songs it can be played in relatively small portions. This is closely related to the idea of creating each work and adapting it to the performer's needs in constructing sound. The impression or image of tradition is one of the main goals in playing the bronze instrument in the Bhavana Ethnic group. The characteristics of traditional ensembles which tend to be unison are clearly different from the 'modern' interpretation of the Bhavana Ethnic group in constructing polyphonic music. The emergence of a traditional image in the Bhavana Ethnic group is displayed through several instrumental elements. The first is the visual element, where visually the shape of the instruments in the Bhavana Ethnic group is deliberately maintained to construct this image. Through this element, the Bhavana Ethnic group stimulates its audience's perception of the reality of the traditions promoted in each performance. Through these visual elements, a dialogue will emerge about the process of mixing modern and ethnic or traditional for the audience.

The construction of a traditional image is also built through the unique characteristics of the sound of metal *gamelan*. People in general quite understand the character of the sounds that emerge from Balinese *gamelan* instruments (*gong kebyar*). In general, the people of West Nusa Tenggara who are the main fans of the music offerings of the Bhavana Ethnic group are quite unfamiliar with the sound of *gamelan*. Building an 'ethnic' image is also created through the use

of percussion techniques (*polos* and *sangsih*). Some of these elements appear to be maintained from the reality of tradition in the construction of the 'ethnic' image presented. This is the main basis for the Bhavana Ethnic group in maintaining the use of materials in adopting traditional *gangsa* instruments. Through the distinctive character of the metal sound, it becomes a stimulant for the audience or listeners to imagine the presence of traditional bronze instruments in the sound presentation presented by the Bhavana Ethnic group. This is also supported by efforts to maintain drumming techniques in the game. Where the Bhavana Ethnic group still uses two drumming techniques, namely *polos* and *sangsih*, as is the case with traditional instruments. *Gangsa* in the Bhavana Ethnic group is only played by two musicians. This is different from the reality in traditional rooms where more than two musicians can play. If in the traditional ensemble each *gangsa* instrument is only played by one person, in the Bhavana Ethnic group one *gangsa* instrument is played by two people. Even though they still maintain the two drumming techniques found in traditional reality, in their implementation each musician plays each technique on one instrument only. This is different from traditional ensemble performances, where each technique is played on a different instrument. In the Bhavana Ethnic group, the two players divide the blade area to be able to play each technique, both *polos* and *sangsih*. The area in question is the arrangement of notes from the lowest note to the middle note (C – F) and (F# – C). The two players face each other in playing each region, in contrast to traditional ensemble groups where each player has a designated position on a different instrument. The results of the musical innovation process carried out by Bhavana Ethnic also show a tendency for interval patterns in the selection of notes in each creation process, see Fig. 3. Even though the *gangsa* instrument has been changed to a diatonic instrument, in its playing Bhavana Ethnic tends to only play five notes with different patterns.

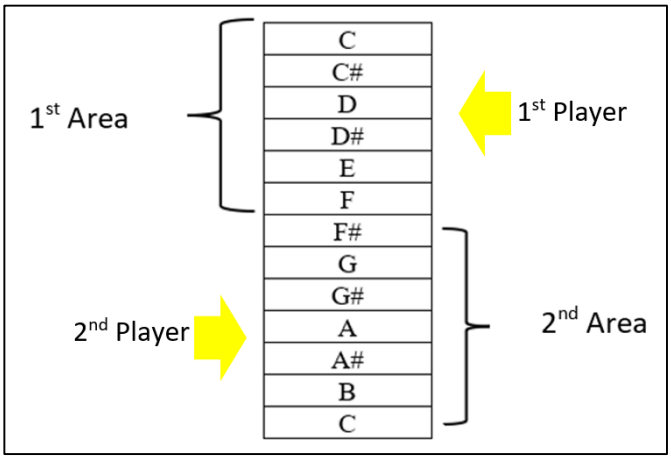

Fig. 3. The position of the player and the division of the area of notes played

The five tones in question were chosen based on the suitability of the sound to the use of basic tones in each song presentation that was composed. The tendencies for interval patterns in question include the 2- ½ -1- 2 -½ pattern on the major scale, and 1-1- 1½ -1 -1½ on the minor scale. If in the Bhavana Ethnic scale group we found a pattern like the one above to divide games based on the use of scales between major and minor, in other research the same thing was also shown to explain the application of the pentatonic scale based on the chord between *pelog* and slendro (Rubiono 2012). In the *pelog* tuning application on a piano or keyboard instrument, the only notes played are notes *1 (do), 3 (mi), 4 (fa), 5 (sol),* and *7 (si*). If you calculate the interval distance for each note, it will also be similar to the interval pattern of Bhavana Ethnic *gangsa* playing on the major scale, namely 2- ½ -1- 2 - ½. The application of the slendro barrel on a piano or keyboard instrument is similar to the selection of notes used by Bhavana Ethnic in the minor scale which has an interval of 1-1-1½ -1 -1½ which includes notes *1 (do), 2 (re), 3 (mi), 5 (sol),* and *6 (la).* However, these findings cannot be concluded to find similarities between the major and *pelog* scales or the minor and slendro scales. Because in other cases, in measurements carried out on *gamelan slendro*, one of them was that there was a tendency for

intervals of almost the same length between one note and another [19]–[21]. One of them is the measurement carried out on the *gamelan slendro Ki Udreka* which has intervals between notes in cents of *217, 195, 276, 189, 258*. Looking at the composition, it actually appears that the distance between the 3rd note and the 4th and 5th note and 1st tends to be wider. Almost similar to the interval pattern that the Bhavana Ethnic group appears in the minor scale, where the distance between the 3rd and 4th notes and the 5th and 1st notes also looks wider. Although it also appears that in the slendro *gamelan* tunings, the intervals between the notes do not give rise to similar numbers considering that there are no particular standards in *gamelan* tuning. A similar problem also appears in efforts to compare the interval distance between notes in the *pelog* barrel with the choice of playing notes in the major scale in the Bhavana Ethnic group.

The main problem is of course not the interval distance between notes when looking at the problem of tone selection. Even though in the process certain pattern tendencies emerge, this cannot yet be a conclusion to justify the similarity between the *pelog* tuning with the major scale and the slendro tuning with the minor scale. However, along the way, it is necessary to carry out a more in-depth study to find the right formulation for creating special standards that can be useful in the learning process. *Gamelan*, as one of Indonesia's cultural treasures, does not have specific standards regarding the exact size of the notes or the distance between the notes. It could even be said that each instrument or ensemble has its own differences and uniqueness. The issue of standardization may be considered inappropriate because it will eliminate the uniqueness of each *gamelan* instrument in Indonesia. However, this also needs to be done in a learning context. Where efforts to find uniformity can become a medium or means in the learning process for society. Through these efforts, people will be helped enough to learn the tones in *gamelan* by using other musical instruments with diatonic scales. *Gamelan* instruments are quite expensive to own and use in the learning process. This is one of the causes of people's reluctance to learn about the rich traditions of the Indonesian nation. This is certainly a threat to the preservation of traditional *gamelan* music itself. Although this discourse on standardizing tones and intervals between tones is not something new, it is an important suggestion in this research. Just like what Bhavana Ethnic has done, by changing the tone and scale configuration on the *gangsa* instrument, it is basically just a stimulant for people to realize the rich traditions they have regarding music. In connection with this research suggestion, further efforts are needed to compare trends in interval patterns in the presentation of traditional instruments. This was done to see how this pattern could form. The next test is to prove that the interval distance formula can be standardized, so that a standard interval standard can be developed as a means to make it easier to learn traditional music using diatonic or modern instruments. Apart from that, testing and proving can become a standard in the creation of new instruments that can be used and utilized in a work process in the field of music.

4. Conclusion

Changes in aspects of the instrument's pitch configuration have implications for changes in the number of notes, pitch range, rules, melodic pattern system, and instrument function in the ensemble. The number of notes on a traditional instrument, which was six notes, has changed to 12 notes. The pitch range which previously reached two octaves, has changed to only one octave. As an innovation, the bronze instrument in the Bhavana Ethnic group is no longer bound by *pakem* (traditional rules). The function of the instrument is no longer the main part (song presenter) but has changed to become a song performer. Apart from the things above, the results of the musical innovation process carried out by Bhavana Ethnic also show a tendency for interval patterns in the selection of tones in each creation process. Even though the *gangsa* instrument has been changed to a diatonic instrument, in its playing Bhavana Ethnic tends to only play 5 notes with different patterns. The five tones in question were chosen based on the suitability of the sound to the use of basic tones in each song presentation that was composed. The tendencies for interval patterns in question include the 2- ½ -1- 2 -½ pattern on the major scale, and 1-1- 1½ -1 -1½ on the minor scale. However, these findings cannot yet be concluded to become a standard theory, because there is a need for further in-depth, testing and proof as an effort to create standardization for learning purposes.

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