Correlation Between Mastery of Music Theory, Solfegio, and Proficiency in Playing Primary Music Instruments at The Intermediate Level in Music Program, Universitas Negeri Surabaya

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Abstract

This research aimed to determine whether there is a significant correlation between mastery of music theory, solfegio, and skills in playing primary music instruments at the intermediate level in the Music Arts Study Program at the State University of Surabaya. The research employed quantitative method with correlational research design. Pearson product-moment correlation analysis was used as the correlational research technique. The prerequisite test indicated that the data followed a normal distribution and that the independent variable and the dependent variable exhibited a linear or symmetrical relationship. The research results revealed a very strong relationship, as evidenced by a Pearson correlation coefficient of 0.893** and 0.891**. The two-star sign (**) in the results indicates a significant correlation with a significance value of 0.000 and a two-tailed possibility. The positive correlation coefficient indicates a unidirectional relationship between the variables. Thus, the research results show a significant relationship between mastery of music theory, solfegio, and intermediate level playing skills on primary music instruments in the Music Arts Study Program at State University of Surabaya. This conclusion is supported by the significance value of 0.000 for both the mastery of music theory variable and the knowledge of solfegio variable in relation to the intermediate level playing skills on primary music instruments. The calculated significance value (sig o) was found to be less than 0.05 (0.01), confirming the statistical significance of the results.
INTRODUCTION

The Music Program is one of the study programs in the Faculty of Languages and Arts at Universitas Negeri Surabaya. In its activities, this program incorporates music education into its learning process. Music education is considered the cornerstone of arts education. This notion is supported by Plato's perspective (Djohan Salim 2005: 175), which highlights the unparalleled ability of music to deeply resonate with and accompany the human soul, surpassing the realms of rhythm and harmony. Consequently, the implementation of music education involves training and refining the sensitivity of perception through engaging in musical activities. This heightened sensitivity enables individuals to experience and appreciate the intricacies of harmony, rhythm, melody, and tempo while playing music.

The Music Program at Universitas Negeri Surabaya also incorporates training and development of sensory perception in musical activities. The program was established in 2015 and is supported by a faculty of 9 educators or lecturers. It has successfully graduated a significant number of students since 2019 and continues to do so.

This study program's presence is evident through numerous awards and achievements received by its students, both locally and internationally. In addition, its existence is further demonstrated by the growing number of prospective students who apply each year. It is worth noting that this music arts study program, which focuses on classical music as its core curriculum, is the sole program of its kind in East Java.

The curriculum used in this study program is the Merdeka Belajar Curriculum, which is tailored to the policies of the Ministry of Education, Culture, Research, and Technology. Within the curriculum structure, various practical and theoretical courses are offered to support the achievement of the program's vision, mission, and graduate profile.

The music arts study program offers a variety of theoretical courses, including music theory, solfeggio, harmony, music history, and more. In terms of practical courses, students can engage in marching band, choir/ensemble/orchestra, and primary instrument classes. The primary instrument classes are further divided into specialized categories such as string, wind, vocal, piano, guitar, and percussion. These instrument specializations are integrated into different levels of primary instrument classes, including introductory practical instrument, sensory level primary instrument, junior level primary instrument, intermediate level primary instrument, and senior level primary instrument classes. This curriculum structure is based on the Merdeka Belajar Curriculum.

The intermediate level primary instrument course is a practical course offered in the fourth semester. This course carries a credit load of 4 SKS (Credit Units) and has a duration of 200 minutes per class. It is conducted in a face-to-face format once a week.

Among the other theoretical courses are music theory and solfeggio. These two courses serve as foundational subjects, where students are expected to master them as a basis for further courses in subsequent semesters. Both courses are offered in the first semester. Each course carries a credit load of 2 SKS (Credit Units).
with a duration of 100 minutes per class. Both courses are conducted in-person once a week.

Based on the preliminary study conducted through observations in the intermediate level primary instrument classes for string, wind, vocal, piano, guitar, and percussion instruments, it is found that there are still numerous challenges and issues. Some of these challenges and issues include students' limited ability to interpret the repertoire of songs they perform. This is evident from their lack of proficiency in reading dynamic markings, expressive markings, and other symbols found in the musical score. As a result, students lack confidence and are unable to fully showcase their skills when playing a repertoire of songs.

One of the other challenges and issues encountered during the preliminary study is the tendency of students to sometimes inaccurately read the rhythm in song repertoire. These challenges and issues in the learning process have an impact on students' development and academic achievements. The development and academic achievements can be observed through three aspects: cognitive, affective, and psychomotor. This argument aligns with Bloom's viewpoint (Bloom 1956: 7) that learning outcomes and achievements can be categorized into three domains: cognitive, affective, and psychomotor. In addition, it is also stated by Cangelosi and S (1995: 7) that behavior constructs are conventionally classified into three domains: affective, cognitive, and psychomotor.

In this research, the intermediate level primary instrument course is a practical course that focuses on learning achievements in the psychomotor domain. The psychomotor domain refers to the abilities and skills of students in playing musical instruments. Therefore, the ability and skill in playing musical instruments are closely related to specific patterns and techniques. This argument is reinforced by the views of Allard and Starkes (Mornell 2012: 155) that movement skill techniques involve "movement patterns." Similarly, it is stated by (Heri 2012: 211) that motor skills refer to an individual's ability to perform a task or movement to the maximum extent of their capabilities.

The ability and skill of students to play musical instruments effectively and accurately is one of the objectives of the intermediate level primary instrument course. Therefore, the objectives of this course align with the broader goals of music education. This is supported by the views of Peters and Miller (Durrant and Welch 1995: 123) who state that the goals of music education include the development of psychomotor skills. In addition, Peters and Miller (Durrant and Welch 1995: 123) state that the psychomotor aspect involves improving coordination and skills in instrument selection, enhancing musical performance abilities, as well as fostering awareness to respond, coordinate, and participate in ensemble (group) playing. However, an individual's ability and skill in playing a musical instrument are also influenced by several factors during their musical activities. This argument is reinforced by the viewpoint of Mornell (Mornell 2012: 19) that achieving high-level musical performance skills requires hours of practice and skill refinement.

Based on the preliminary study conducted through observations and surveys as previously discussed, this research aimed to establish and investigate the correlation between
students’ understanding of music theory and solfeggio and their abilities and skills in playing musical instruments in the intermediate level primary instrument course. The objective of this study was to determine whether there is a significant correlation between students' mastery of music theory and solfeggio and their proficiency in playing intermediate level primary instruments in the music program at Universitas Negeri Surabaya.

**METHOD**

The research method employed was quantitative method with correlational research design. The specific type of correlational research used was Pearson's product-moment correlation analysis, which involved data measured on an interval scale. This argument is supported by Sugiyono's viewpoint (Sugiyono 2010: 228), stating that the product-moment correlation is utilized to examine the relationship and test the hypothesis between two variables when the data for both variables are in the form of interval or ratio scales and obtained from the same source.

The population of this study consisted of all students from the 2020 batch of the music arts program who were taking the courses in music theory, solfeggio, and intermediate level primary instrument, totaling 83 students. The sampling method used in this research was probability sampling with the technique of simple random sampling. Simple random sampling is a technique where each member of a population has an equal chance of being selected as a sample (Siregar and Syofian 2012: 145). The sample size was determined using the Slovin's formula, resulting in a sample size of 69 students with a margin of error of 5%.

The variables in this study were music theory, solfeggio, and intermediate level primary instrument. These variables consisted of three variables, namely two independent variables and one dependent variable. The independent variables were music theory (X1) and solfeggio (X2). On the other hand, the dependent variable was the skill of playing the intermediate level primary instrument (Y).

The data collection techniques used were tests, observations, and documentation. Observations were conducted by directly observing the research subjects during the study. In this study, documentation was used to support the data gathered from observations, research implementation, and activities during the tests of music theory, solfeggio, and intermediate level primary instrument skills. Meanwhile, tests of music theory, solfeggio, and intermediate level primary instrument skills were conducted on the research sample by examining the scores or grades in music theory, solfeggio, and intermediate level primary instrument skills during the course. The data collection instruments in this study included music theory tests, solfeggio tests, and tests of intermediate level primary instrument playing skills.

The data analysis technique used was the Pearson product-moment correlation test. Before applying the data analysis technique with the Pearson product-moment correlation test, several requirements were necessary for this study. These requirements included having normally distributed data and symmetrical independent variables (X1 and X2) with the dependent variable (Y).

In this study, data analysis was supplemented with descriptive
statistics. The presentation of descriptive statistical data included mean, median, mode, standard deviation, variance, minimum score, maximum score, range, and graphs. Meanwhile, inferential analysis consisted of prerequisite tests, such as normality test using the Kolmogorov-Smirnov method, and linearity test using the linearity test table of Anova by searching for the Deviation from Linearity value from the linear F test. After conducting descriptive analysis and inferential analysis, the next step was hypothesis testing. Hypothesis testing was performed using the Pearson product-moment correlation test.

RESULTS AND DISCUSSION
Description of Research Results

Data description is an overview of the data obtained to support and supplement the research findings and discussion. This research is conducted through theory music test, solfeggio test, and skill test in playing the intermediate level primary instrument. The three tests are carried out on the sixteenth meeting. These tests are conducted after the completion of learning from the first to the fifteenth meeting. The three tests are used to determine the scores or values of mastery in music theory, solfeggio knowledge, and skill in playing the intermediate level primary instrument. The data description provides an overview of the final condition of students' mastery in music theory, solfeggio knowledge, and skill in playing the intermediate level primary instrument after receiving instruction from the assigned lecturer from the first to the fifteenth meeting. The data description obtained from the theory music test, solfeggio test, and skill test in playing the intermediate level primary instrument is presented quantitatively, including measures such as mean, median, mode, standard deviation, variance, minimum score, maximum score, range, and graphs. The results of descriptive statistical analysis and hypothesis testing are presented and described as follows:

a. Descriptive Statistical Analysis Results

The data description consists of the results of the music theory test, solfeggio test, and skill test in playing the intermediate level instrument, in the form of quantitative data. These three tests were administered to the students of the 2020 batch of the music arts program, in a single session, specifically during the sixteenth meeting, following the completion of learning sessions from the first to the fifteenth meeting. The music theory test and solfeggio test were conducted in written form. The data was obtained from the students' mastery of the music theory and solfeggio materials. On the other hand, the skill test in playing the intermediate level instrument was conducted practically. The data was obtained from the students' abilities and skills in playing the instrument.

After obtaining the data, the next step was to analyze the data using descriptive statistics. The data description of the results of the music theory knowledge test, solfeggio knowledge test, and skill test in playing the intermediate level instrument is shown in Figure 1.
Figure 1 reveals that the highest score in the test of music theory mastery is 100, and the lowest score is 85. The highest score in the test of solfeggio mastery is 100, and the lowest score is 65. Meanwhile, the highest score in the test of proficiency in playing the intermediate-level primary instrument is 99, and the lowest score is 61.

The mean obtained in the test of mastery of music theory is 83.7478, the mean of the test of solfeggio knowledge is 84.7551, while the mean of proficiency test in playing the intermediate-level primary instrument is 84.7797. The mean values from the three tests conducted indicate that the highest mean score is found in the test of proficiency in playing the intermediate-level primary instrument.

The results of the music theory mastery test are indicated by a standard deviation of 8.12948, a median of 83.70, a mode of 80, a variance of 66.088, and a range of 35. The results of the solfeggio test are also indicated by a standard deviation of 8.92743, a median of 85, a mode of 85, a variance of 79.699, and a range of 34. Meanwhile, the results of the intermediate-level primary instrument playing skill test are also indicated by a standard deviation of 8.57924, a median of 84, a mode of 83.40, a variance of 73.603, and a range of 38.80.

The graph of the mean or average results of the music theory mastery test, solfeggio test, and intermediate-level primary instrument playing skill test is presented in Figure 2.

Figure 2. Mean Graph of the Three Tests

Figure 2 depicts that the highest mean value is found in the test of proficiency in playing the intermediate-level instrument. However, the range of averages does not indicate results with a significantly close or nearly equal range. This is shown by the mean values of 84.7551 for the test of music theory proficiency, 83.7478 for the test of solfeggio knowledge, and 84.7797 for the test of proficiency in playing the intermediate-level instrument. Based on this description, it can be concluded that the highest mean value is found in the test of proficiency in playing the intermediate-level instrument, followed by the music theory test, and the lowest mean value is found in the solfeggio test.

b. Hypothesis Testing Results

Inferential analysis was used to test the research hypothesis, which is whether there is a significant correlation between mastery of music theory and solfeggio with the skill in
playing the intermediate level instrument. The following are the steps of the inferential analysis:

1. Prerequisite Test Analysis

The prerequisite test analysis is conducted to determine whether the data used for the research is normally distributed and whether the independent variables (X1 and X2) and the dependent variable (Y) are symmetric. The prerequisite test analysis serves as a preliminary test conducted before analyzing the data in the hypothesis testing stage, specifically the Pearson product-moment correlation test. The prerequisite test analysis consists of the normality test and the linearity test. Both tests are described as follows:

1) Normality Test

The use of the normality test is intended to determine whether the data follows a normal distribution or not. In other words, the normality test is employed to assess whether the sample of 69 students from the 2020 music art program is normally distributed or not during the assessment of their mastery in music theory, solfeggio, and intermediate-level instrument playing skills. This aligns with the view of Suharsimi A (Arikunto 2013: 301), who states that the normality test is conducted to examine whether the data distribution to be analyzed is normal or not.

The normality test used in this study employed the Kolmogorov-Smirnov method. The decision criteria (Santoso 2015: 393) state that if the significance value (sig) is greater than 0.05, the data are normally distributed, whereas if the sig value is less than 0.05, the data are not normally distributed. The normality test was conducted using the SPSS software program.

The results of the normality test using the Kolmogorov-Smirnov method on a research sample of 69 music students during the tests of theoretical music knowledge, solfeggio, and proficiency in playing the intermediate-level primary instrument are shown in Figure 3.

![Figure 3. Normality Test Result](image)

Figure 3 shows the results of the Kolmogorov-Smirnov test on the research sample which indicate that the sig value for proficiency in playing the intermediate-level primary instrument is 0.200. The sig value for theoretical music knowledge is 0.098, while the sig value for solfeggio knowledge is 0.056. The normality test results for all three tests show that the sig values are greater than 0.05, indicating that the data follows a normal distribution. This is evidenced by the sig values of 0.200, 0.098, and 0.056 during the tests of theoretical music knowledge, solfeggio knowledge, and proficiency in playing the intermediate-level primary instrument.

2) Linearity Test

The linearity test is used to examine the symmetry of the independent variables (X1 and X2) with the dependent variable (Y). In other words, the linearity test is used to determine whether there is a linear relationship between the independent variables (X1 and X2) and the dependent variable (Y).

The linearity test in this study uses the ANOVA linearity test by
finding the value of Deviation from Linearity from the linear F test. Regarding the decision criteria, Hadi (1977: 14) states that if the significance coefficient value of Deviation from Linearity is greater than the alpha value of 0.05, then the relationship between variables is linear or symmetrical. The linearity test is performed with the assistance of SPSS software.

The results of the linearity test, based on the significance coefficient values of Deviation from Linearity, are shown in Figure 4.

The normality and linearity tests obtained indicate that the data distribution is normal, and the independent variables (X1 and X2) have a linear or symmetrical relationship with the dependent variable (Y). Next, hypothesis testing is conducted. The test used to analyze the research data and test the hypothesis is correlation analysis. This correlation test is used to determine if there is a significant correlation between the mastery of music theory and solfeggio with the skill of playing the intermediate level of the primary instrument in the music art program at Universitas Negeri Surabaya. The calculation of this correlation test uses the Pearson product-moment correlation and is computed using the SPSS software. The decision criterion (Sarwono 2015: 105-106) mentions that if the significance value is < 0.05, it can be concluded that there is a significant relationship between the independent variables and the dependent variable.

The Pearson product-moment correlation test is divided into three parts, which are interpreted as follows:

a) Interpretation of the relationship strength between variables

The first part of the interpretation of the output is to examine the strength of the relationship between the independent variables (X1 and X2) and the dependent variable (Y). The results of the calculation of the strength of the relationship between variables are shown in Figure 5.
the variable of intermediate level instrument playing skills). The magnitude of the correlation between these variables (Sarwono 2015: 105) indicates a very strong relationship as it approaches the value of 1. Meanwhile, the presence of two asterisks (**) in both results indicates that the correlations are significant at a significance level of 0.000 and have a possibility of two-way association (two-tailed).

b) Interpretation of the relationship significance between variables

The next part of the interpretation is to compare the calculated significance value with the criteria significance (alpha). The results of the significance calculation between variables are shown in Figure 6.

<table>
<thead>
<tr>
<th>Skill in Playing Music Instruments</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill in Playing Music Instruments</td>
<td>1</td>
<td>N</td>
</tr>
<tr>
<td>Knowledge of Music Theory</td>
<td>.893 **</td>
<td>.000</td>
</tr>
<tr>
<td>Knowledge of Solfeggio</td>
<td>.891 **</td>
<td>.000</td>
</tr>
</tbody>
</table>

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

Figure 6. Significance Results of the Relationship between Variables

Figure 6 shows that the calculated significance values are 0.000 (for the relationship between mastery of music theory and skills in playing the intermediate level primary instrument) and 0.000 (for the relationship between knowledge of solfeggio and skills in playing the intermediate level primary instrument). These values indicate that the calculated significance (sig o) is less than 0.05 (0.01). Therefore, it can be concluded that there is a significant relationship between mastery of music theory and skills in playing the intermediate level primary instrument. Another conclusion is that there is a significant relationship between knowledge of solfeggio and skills in playing the intermediate level primary instrument.

c) Interpretation of the correlation direction between Variables

The final part of the output interpretation involves examining the direction of correlation between variables. The direction of correlation can be determined by the sign of the correlation coefficient, indicating whether the result is positive or negative. The calculated direction of correlation between variables is shown in Figure 7.

<table>
<thead>
<tr>
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<td>.891 **</td>
<td>.000</td>
</tr>
</tbody>
</table>

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

Figure 7. Directional Results of the Correlation between Variables

Figure 7 shows that the correlation coefficient values are positive, namely 0.893 (between the variable of mastery of music theory and the variable of proficiency in playing the intermediate-level primary instrument) and 0.891 (between the variable of solfeggio knowledge and the variable of proficiency in playing the intermediate-level primary instrument). Therefore, it can be concluded that there is a positive correlation between the variables. In
other words, if the students have a high mastery of music theory, their proficiency in playing the intermediate-level primary instrument is also high. The same result is indicated when the students have a high knowledge of solfeggio, their proficiency in playing the intermediate-level primary instrument is also high.

As mentioned in the introduction, the purpose of this research is to determine the presence of a significant correlation between the mastery of music theory and solfeggio knowledge with the proficiency in playing the intermediate-level primary instrument in the music art program at the State University of Surabaya. Based on the data analysis conducted, it is found that there is a significant correlation between the mastery of music theory and the proficiency in playing the intermediate-level primary instrument. Furthermore, the results also indicate a significant correlation between knowledge of solfeggio and the proficiency in playing the intermediate-level primary instrument.

This conclusion is supported by the scores obtained from the significance values, which are 0.000 (for the relationship between the knowledge of music theory and the skill of playing the intermediate-level primary instrument) and 0.000 (for the relationship between knowledge of solfeggio and the skill of playing the intermediate-level primary instrument). These calculated significance values indicate that the computed significance value (sig 0) is less than 0.05 (0.01).

The results of the Pearson product-moment correlation test indicate a significant relationship between the mastery of music theory, solfeggio, and the skill of playing intermediate-level primary instruments in the Music Art Study Program at Universitas Negeri Surabaya. Therefore, instrument playing skills are considered as an aspect of the psychomotor domain that requires a foundation of material insights from previous learning. As stated by Peters and Miller (1982: 162), the psychomotor domain is crucial in various fields of education, including music and art, which require motor skills. Motor skills are an essential component of the learning process.

CONCLUSION

Based on the results of descriptive statistical analysis, it is found that the highest score in the music theory test is 100, and the lowest score is 85. The highest score in the solfeggio test is 100, and the lowest score is 65. Meanwhile, the highest score in the intermediate-level primary instrument playing skill test is 99, and the lowest score is 61.

The results of the music theory test are indicated by a standard deviation of 8.12948, a median of 83.70, a mode of 80, a variance of 66.088, and a range of 35. The results of the solfeggio test are also indicated by a standard deviation of 8.92743, a median of 85, a mode of 85, a variance of 79.699, and a range of 34. Meanwhile, the results of the intermediate-level primary instrument playing skill test are indicated by a standard deviation of 8.57924, a median of 84, a mode of 83.40, a variance of 73.603, and a range of 38.80. The average scores obtained in the music theory test are 83.7478, the average scores in the solfeggio test are 84.7551, while the average scores in the intermediate-level primary
instrument playing skill test are 84.7797.

Meanwhile, the linearity test results with a significance coefficient value of 0.215 from Deviation from Linearity indicate that the significance value is greater than 0.05. Therefore, it can be stated that the independent variables (X1 and X2) and the dependent variable (Y) have a linear or symmetrical relationship.

The research findings obtained using the Pearson product-moment correlation test and descriptive statistics reveal that there is a significant relationship between mastery of music theory and solfeggio with the skill of playing intermediate-level instruments in the Music Program at Universitas Negeri Surabaya. This conclusion is supported by the score obtained from the calculation of the significance value, which is 0.000 (for the correlation between mastery of music theory and the skill of playing intermediate-level instruments) and 0.000 (for the correlation between knowledge of solfeggio and the skill of playing intermediate-level instruments). These significance values indicate that the calculated significance value (sig o) is less than 0.05 (0.01).

Another interpretation of the output is indicated by the calculation of the Pearson correlation coefficients, which are 0.893** and 0.891**. The magnitude of these correlations indicates a very strong relationship as they approach the value of 1. Meanwhile, the presence of two asterisks (**) in both results can be interpreted as a significant correlation with a significance level of 0.000 and a possibility of two-tailed direction.

Meanwhile, the interpretation of the correlation coefficient yields positive results of 0.893 and 0.891. Therefore, it can be concluded that there is a positive correlation between the variables. In other words, when students have a high level of mastery in music theory, their proficiency in playing intermediate-level instruments is also high. The same holds true for students with a high level of knowledge of solfeggio, as their proficiency in playing intermediate-level instruments is also high.

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