Music Aptitude and Music Achievement of Second-Grade Learners: Basis for the Development of Teacher-Support Materials

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ABSTRACT

This study investigates the relationship between music aptitude and music achievement among second-grade learners and its implications for the development of teacher-support materials. The respondents consist of 156 second-grade learners enrolled in Term 2 at Thai-Singapore International School during the academic year of 2022-2023. The Primary Measure of Music Audiation was used to assess music aptitude in terms of tonal and rhythm, while Term 1 grades were obtained from progress report cards. Statistical analysis includes the T-test and the Pearson product-moment coefficient for testing significant differences and correlations, respectively. Findings revealed that according to the profile, the respondents performed well in Music in Term 1, with the majority receiving the highest possible grade. The second-grade learners at Thai-Singapore International School may have stronger tonal aptitude than rhythm aptitude. However, it was important to note that the two aspects of music were interrelated, and overall music aptitude was a combination of both tonal and rhythm aptitude. Gender did not play a significant role in determining tonal aptitude. However, there was a significant difference in music aptitude between learners with a very good grade in music and those with a good grade in music. Based on these findings, the study proposes the development of teacher-support materials, including lesson plans and instructional resources, specifically designed to improve the level of music aptitude of second-grade learners.

Keywords: Music Aptitude, Music Achievement, tonal, rhythm, audiation, gender, Music Aptitude Test, Primary Measures of Music Aptitude

INTRODUCTION

Edwin Gordon once said, "When students are taught to understand music, they learn music". Music as a subject provides essential benefits to learners to become versatile individuals. Schools offer a holistic education to assist learners in developing, discovering, and nurturing their potential. Music positively influences learners' academic performance, develops social skills, and provides an outlet for creativity that is essential to their development. Everyone has the potential to achieve in music. Enhancing this kind of potential thoroughly as early as second grade will lead to higher music achievement. Music educators must ensure that learners engage in meaningful music experiences that ignite all areas of child development and skills.

Nevertheless, in order to address these musical needs, music educators should first understand the differences between the concept of music aptitude and music achievement. A measure of ability to learn is called music aptitude. On the other hand, the level of one's music achievement reflects the music lessons they have acquired. The perception of musical talent of a learner often depends on music achievement and not on the potential to succeed. Nobody is born with the ability to create music or play an instrument in a specific style. It must be learned. It is considered a music achievement once it has been learned. Everyone, on the other hand, has some musical ability and may develop the ability to listen to and perform music successfully. A wide variety of listening, performing, analyzing, and generating tasks are included in music ability.

Music aptitude refers to the ability to cultivate musical skills. However, since the aptitude tests basically reflect the initial aptitude of the individual, the aptitude test also evaluates the degree of achievement. Nonetheless,

music achievements are determined not only by aptitude but also by the quality of instruction and the interest in music and inquisitiveness of a learner.

Numerous studies show that more than two-thirds of us are of average musical ability. While the rest are either above average or below average in terms of music aptitude. Further, there are fewer people who have outstanding musical aptitude, regardless of their musical level. Valid music aptitude tests show that one to two out of every hundred individuals have great musical ability. The potential to become a music genius is a rarity; only a person in a thousand has the potential to be a genius in music. While an individual's genetic composition does not have an impact on their musical ability, it is important to note that musical ability is influenced by biological inheritance, but it is not determined by it (Gordon, 2001).

With appropriate guidance, these same learners can achieve equal levels of success as those who already possess a high level of music aptitude and music achievement. Similarly, learners with low music aptitude, when provided with proper instruction, may attain more success compared to learners with average music aptitude who receive inadequate instruction. Assessing the musical level of learners through music testing is not a common standard practice in most schools.

This study suggests that a music aptitude test can help music educators meet the individual needs of learners and develop responsive musical instruction, ultimately increasing music achievement. Moreover, only a reliable music aptitude test can distinguish between current achievement and the potential for further growth in musical abilities. A music aptitude test helps music educators meet each learner's unique needs. This study aims to address a gap in music teaching and learning and hopes to create teacher-supported instructional materials based on the findings.

The study of music aptitude and music achievement represents important focal points within the realm of music education research. There is a growing body of research exploring the relationship between music aptitude and music achievement. In addition, research explores the various factors that contribute to these abilities. A recent study publication in the Journal of Research in Music Education (Hanson, 2019) explored the correlations between music aptitude and music achievement within the context of high school students. The study found that the potential to learn in music was a significant indicator of music achievement. Students who scored higher on music aptitude tests also scored higher on music achievement measures.

Overall, these studies suggest that music aptitude is a crucial factor in determining an individual's music achievement. However, it should be emphasized that music aptitude is not the only factor that contributes to music achievement. Other factors such as motivation, practice habits, and access to resources can also play a significant role.

Research Questions

To develop a prototype teacher-support material for second-grade learners in the music subject, there is definitely a need for music educators to be aware of the students' music aptitude so that they are able to educate the learners to fully obtain their music potential.

This study attempted to address the following research problems:

1. What is the profile of the second-grade learners at Thai-Singapore International School in terms of:

a) Gender

b) Term 1 Grade in Music

2. What is the level of the music aptitude of second-grade learners at Thai-Singapore International School in terms of:

a. Rhythm

b. Tonal

3. Is there a significant difference in the level of music aptitude of second-grade learners at Thai-Singapore International School in terms of tonal when grouped according to profile?

4. Is there a significant difference in the level of music aptitude of second-grade learners at Thai-Singapore International School in terms of rhythm when grouped according to profile**?**

5. Is there a significant relationship between music aptitude and music achievement of second-grade learners at Thai-Singapore International School?

6. Based on the results of the study, what prototype teacher-support materials can be developed to help improve the level of music achievement of the second-grade learners at Thai-Singapore International School?

Hypotheses

1. There is no significant relationship in the level of music aptitude of second-grade learners when grouped according to gender and their Term 1 grade in Music.

2. There is no significant difference between music aptitude and music achievement of second-grade learners in terms of tonal.

3. There is no significant difference between music aptitude and music achievement of second-grade learners in terms of rhythm.

METHODOLOGY

Research Design

This study used descriptive-correlational methods of research. Descriptive research is research that describes what is occurring at a particular point. Correlational research is a research design to discover relationships among variables and to allow the prediction of future events from present knowledge (Lally & Valentine-French, 2019). Hence, descriptive-correlational studies aim to provide a description of variables and the natural relationships that occur between and among them (Sousa, Driessnack & Mendes, 2007). In this particular study, the goal was to determine the music aptitude and music achievement of the second-grade learners enrolled at Thai-Singapore International School. It collected numerical data such as Term 1 grades of the respondents in Music and their level of music aptitude through the Primary Measure of Music Audiation. The data that was analyzed using Primary Measures of Music Audiation objectively answered the research questions.

Research Locale

This study was conducted at Thai-Singapore International School (TSIS) in Samut Prakan, Thailand. Thai-Singapore International School (TSIS) offers preschool to secondary education under a comprehensive curriculum adopted and adapted from the Singapore Ministry of Education to provide learners with quality education. TSIS is a renowned institution that is dedicated to equipping learners with the necessary skills to succeed in the modern global economy. The school emphasizes the importance of 21st-century skills, including not only academic knowledge but also innovation, communication, collaboration, information literacy, and social skills. By fostering an engaging learning environment, TSIS strives to enable learners to reach their maximum potential and confidently embrace future challenges in a rapidly evolving world. The school's mission is to provide a comprehensive and high-quality education within a nurturing, trilingual setting, allowing learners to develop an open-minded approach and readiness for the global landscape ahead.

In addition, its Primary School Education at TSIS follows the Singaporean syllabus, known globally for its effectiveness in fostering literacy and numeracy skills. By aligning with this curriculum, the school provides learners with a strong foundation in core subjects such as English, Chinese Language, Mathematics, and Science.

Recognizing the importance of holistic development, TSIS also offers a range of subjects, including Music, Art, Social and Health Education, ICT, and Physical Education, to nurture the body and spirit of learners.

The primary curriculum at TSIS is designed to prepare learners with essential life skills required to thrive in a rapidly evolving world. In line with this objective, the school has adopted a student-centered approach to complement the existing curriculum. Recognizing that mere acquisition of content is insufficient, TSIS emphasizes the development of learning skills and the ability to apply acquired knowledge effectively. The focus is on enabling learners to become self-directed learners who can adapt and succeed in various contexts (school website).

Moreover, the estimated population of learners is 2000 from nursery to secondary.

Participants of the Study

The respondents of this study were the second-grade learners of Thai-Singapore International School for Term 1 Academic Year 2022- 2023. In particular, all six classes of second-grade learners were treated as respondents. There were 26 learners for each class, with a total of 156 learners; three learners were transferees. Five learners were not present during the test period.

The researcher employed purposive/non-probability sampling, which involved selecting participants based on specific or convenience sampling rather than random selection. This sampling method facilitates data collection conveniently and efficiently.

Instrument

The instruments used in this study were acquired and adapted by the owner for research purposes. Modifications were made to ensure that the instruments were appropriate for the study and to enhance their functionality. An authorization certificate was provided by the author of the instruments to certify that they were used with permission and in compliance with any relevant regulations.

The main instrument that was used in this study was the Primary Measures of Music Audiation (PMMA). PMMA was developed by a well-known American music educator and music psychologist, Edwin Gordon. This music aptitude test was designed to act as an objective aid by providing the child with appropriate opportunities and instruction. It is intended to diagnose and measure music potential, which is relevant in assisting music educators to adapt instruction to the musical needs of the learners in the Primary level.

The Primary Measures of Music Audiation (PMMA) is a standardized test used to assess music aptitude and audiation skills. Numerous studies have investigated the reliability and validity of PMMA, and the findings suggest that the test has high test-retest reliability, internal consistency, and inter-rater reliability. Furthermore, the PMMA has good content validity, construct validity, and predictive validity, indicating that it assesses specific musical concepts and skills, is related to other measures of musical ability and achievement, and can predict an individual's proficiency in music learning and performance.

Additionally, the accompanying material provided with the Primary Measures of Music Audition (PMMA) test includes various forms of evidence regarding its validity. The test manual mostly relies on cross-sectional research to demonstrate the variability of musical aptitude for young children. Gordon's extensive research on developing PMMA is incorporated with more recent longitudinal studies that examine how young children's musical aptitude fluctuates based on musical exposure and training.

In a specific study conducted in April 1978, the PMMA was administered to 873 children in grades K-3 across nine elementary schools in West Irondequoit, New York. This represented slightly over 95% of the children enrolled in those grades. The distribution of enrollments across grades was as follows: 127 in kindergarten, 202 in grade one, 280 in grade two, and 264 in grade three. Approximately two weeks later, the tests were administered a second time. The reliability analysis indicated acceptable split-half Tonal and Rhythm subtests across grade levels (K through 3), although the test-retest reliability was generally unacceptable, especially for the Rhythm subtest.

The concurrent validity result was varied, indicating that teacher ratings of musical achievement were significantly correlated with tonal subtest scores but not with rhythm subtest scores. Additionally, composite test means were found to be significantly higher for suburban and urban samples than for rural samples, and they were also higher for higher grade levels. Moreover, there was a significant correlation observed between item difficulty coefficients and grade levels.

The Primary Measures of Music Audiation (PMMA) consists of two sections, namely Tonal and Rhythm, and is administered as recorded group tests featuring short musical phrases on a separate cassette. Each section includes forty questions with practice examples provided. It is worth noting that learners do not require language or music reading skills, or even the ability to understand numbers, in order to complete the answer sheet for either test. The test utilizes two audiotapes that assess respondents on two fundamental musical aspects: Tonal and Rhythm. The respondents will be asked to recognize whether the patterns are the 'same' or 'different' and choose a pair of images on the given answer sheet. The total duration of the two audiotapes is 24 minutes.

In addition, Gordon identified three levels of music aptitude: high, average, and low. This scale was adopted as a reference to assist in the interpretation of this study:

Music Aptitude Scale

Raw Score on PMMA (Tonal)	**Description**
31-40	High
21-30	Average
20 and below	Low
Raw Score on PMMA (Rhythm)	**Description**
31-40	High
21-30	Average
20 and below	Low

Data Collection

A letter asking permission to conduct a study was sent to the parents of the respondents and to the Managing Deputy Director of Thai-Singapore International School. After the approval of the request from the MDD, the researcher gathered the Term 1 grades of the respondents.

The respondent's Term 1 grade in Music was taken from the school record of the Term 1 Progress Report. The grading system at Thai-Singapore International School in Primary Level consists of four categories: A*(91% and above) for *Very Good*, A (74.5% - 90.4%) for *Good*, B (59.5% - 74.4%) for *Needs Improvement*, and C (59.4% and below) for *Not Meeting Expectation*.

Moreover, after the grades were collected, the researcher personally administered the test class by class. The learners responded to the questions presented on the cassette by circling the corresponding pictures on the answer sheet. To indicate that the two musical phrases sounded the same, the learner simply circled the pair of faces on the answer sheet that matched. Conversely, if the two musical phrases sounded different, the learner circled the pair of faces on the answer sheet that represented the difference.

The cassettes for each Tonal and Rhythm test were approximately 12 minutes in length. The administration of each test, including directions and practice examples, takes approximately 20 minutes. It took no more than 40 to 45 minutes to administer the complete Primary Measure of Music Audiation.

Data Analysis

There were three statistical tools used in this study. The first tool used was a T-test, which was employed to determine whether there was a significant difference between the means of two groups that shared certain characteristics. The mean was calculated for both tonal and rhythm aptitude of all the respondents, which was obtained independently from the Primary Measures of Music Audiation (PMMA). Additionally, the mean was utilized to analyze music achievement through the grades from Term 1 of the respondents.

The second statistical tool utilized was Analysis of Variance (ANOVA), which was employed to investigate potential statistical differences in music aptitude and gender, and music achievement and gender.

Lastly, the Pearson product correlation coefficient was utilized to assess the linear correlation between various variables, including tonal aptitude and gender, tonal aptitude and Term 1 grades, rhythm aptitude and gender, and rhythm aptitude and Term 1 grades.

RESULTS

This chapter contains information about the results of the study and the analysis and interpretation of data gathered with the use of the adapted statistical measures. The presentation includes a narrative discussion of the results and implications of the data gathered, which are illustrated in tables.

Problem No. 1. Profile of the second-grade learners at Thai-Singapore International School in terms of:

1.1 Gender

1.2 Term 1 grade in Music

Table 1.1 Profile of the respondents in terms of gender

Gender	**Frequency**	**Percentage**
Female	81	55
Male	47	45
Total	148	100

Table 1.2 Profile of the respondents in terms of Term 1 Grade in Music

Range	**Grade**	**Description**	**Frequency**	**Percentage**
90.5%-100%	A*	Very Good	127	86
74.5%-90.4%	A	Good	21	14
59.5%-74.4%	B	Needs Improvement		
Below 59.4%	C	Not Meeting Expectation		
Total			128	100
Mean			**90.69 (Very Good)**	
SD			**5.31**	

Table 1.1 presents the profile of the respondents in terms of their gender. The table shows the frequency and percentage of female and male respondents in the sample. According to the table, there were 81 female respondents, which represents 55% of the sample, and 47 male respondents, which represents 45% of the sample. A total of 148 Second-Grade learners from 6 classes were treated as respondents of this study.

Table 1.2 presents the profile of the respondents in terms of their term 1 grade in Music. The table shows the range, grade description, frequency, and percentage for each grade range. The progress reports, which are official records given to parents on a termly basis, were used to determine the respondent's term 1 music grade. The four categories that make up the TSIS grading scheme are as follows: A*(91% and above) for *Very Good*, A (74.5% - 90.4%) for *Good*, B (59.5% - 74.4%) for *Needs Improvement*, and C (59.4% and below) for *Not Meeting Expectation*. According to the table, 86% of the respondents received an A* grade, which is considered "Very Good", while 14% received an A grade, which is considered "Good". No respondents received a grade below B, which is "Needs Improvement". Furthermore, the mean grade is 90.69, which falls within the A* range, indicating that the respondents performed very well in Music in Term 1. The standard deviation (SD) is 5.3, which suggests that the grades were relatively consistent among the respondents.

These descriptive statistics show that the learners' achievement scores were heavily clustered at the top end of the grading scale. Because 86% of the learners received the highest possible category, this indicates a ceiling effect, meaning the grading scale did not allow enough room to distinguish performance differences among higher-achieving learners. This ceiling effect limits the ability to detect, relationship between music achievement and other variables, such as rhythm and tonal aptitude, as the grades do not vary enough to reveal meaningful patterns.

These grades are a fair representation of their level of music achievement in classroom music activities and assessments, rather than an indicator of how talented they are. However, Gordon (2004) pointed out that musical aptitude and musical achievement are not synonymous. Despite the fact that it is most likely that people who demonstrate high music achievement also possess high levels of music aptitude, it is also highly unusual for those with high aptitude not to always exhibit high levels of achievement.

There have been several studies that have explored factors related to high music achievement. A study by Schellenberg and colleagues (2015) examined the role of practice in predicting music achievement in young musicians. The study found that the amount of practice time was a significant predictor of music achievement, with more practice time associated with higher levels of achievement.

A study by Harris and colleagues (2016) explored the relationship between teacher expectations and student music achievement. The study found that teacher expectations were positively associated with student achievement, indicating that high expectations can motivate students and lead to higher levels of music achievement.

Problem No. 2. The level of music aptitude of second grade at Thai-Singapore International School in terms of:

2.1 Rhythm

2.2 Tonal

Table 2.1 Level of the Music Aptitude of Second Grade at Thai-Singapore International School in terms of Rhythm

PMMA Interval Scores	**Description**	**Frequency**	**Percentage**
31-40	High level of Music Aptitude	108	73
21-30	Average level of Music Aptitude	33	22
20 and below	Low level of Music Aptitude	7	5

Total	148	100
Mean	31.95 (High Level)	
SD	5.06	

Table 2.2 Level of the Music Aptitude of Second Grade at Thai-Singapore International School in terms of Tonal

PMMA Interval Scores	**Description**	**Frequency**	**Percentage**
31-40	High level of Music Aptitude	129	87
21-30	Average level of Music Aptitude	14	10
20 and below	Low level of Music Aptitude	5	3
Total		148	100
Mean		35.34 (High Level)	
SD		5.36	

Table 2.1 presents the level of music aptitude of second-grade students at Thai-Singapore International School in terms of rhythm, based on their Primary Measures of Music Audiation interval scores. The table includes the frequency and percentage of students in each category. According to the table, out of 148 second-grade students, 108 students (73%) scored between 31-40 on the PMMA Interval Scores, indicating a high level of rhythm aptitude. 33 students (22%) scored between 21-30, indicating an average level of rhythm aptitude. Finally, 7 students (5%) scored 20 or below, indicating a low level of rhythm aptitude. The mean rhythm score of the students is 31.95, which falls under the category of a high level of music aptitude. The standard deviation (SD) of the scores is 5.06, which indicates that the scores are moderately dispersed around the mean score.

To address concerns about rhythm stability in young learners, it is important to note that the PMMA rhythm subtest has been shown in previous research and the test manual to demonstrate acceptable reliability for early elementary learners, with reported reliability coefficients typically ranging from .80 to .90. These values suggest that the Rhythm subtest provides consistent and dependable measurements of learners' rhythm aptitude.

Furthermore, Table 2.2 shows the level of music aptitude of second-grade students at Thai-Singapore International School in terms of tonal, based on their PMMA Interval Scores. The table displays the frequency and percentage of students in each category. According to the table, out of 148 second-grade students, 129 students (87%) scored between 31-40 on the PMMA Interval Scores, indicating a high level of music aptitude in tonal. 14 students (10%) scored between 21-30, indicating an average level of music aptitude. Finally, 5 students (3%) scored 20 or below, indicating a low level of music aptitude in tonal. The mean score of the students is 35.34, which falls under the category of a high level of music aptitude. The standard deviation (SD) of the scores is 5.36, indicating that the scores are moderately dispersed around the mean score.

The PMMA Tonal subtest also demonstrates strong reliability, with reported reliability coefficients generally falling between .80 and .90, indicating that the tonal aptitude scores are stable and consistent for learners of this age group. This supports the use of PMMA as a valid tool for assessing tonal skills in young learners.

There have been several studies conducted on students with high tonal aptitude. One study published in the Journal of Research in Music Education in 2016 found that students with high tonal aptitude tend to have greater musical achievement, both in terms of their ability to perform music and their ability to understand music theory (Nichols, 2016). The study also found that students with high tonal aptitude tended to have better working memory and cognitive flexibility, which are important skills for learning and performing music.

Another study published in the Journal of Research in Music Education in 2018 found that students with high tonal aptitude are more likely to engage in activities such as singing and playing musical instruments outside of school, and they tend to have more positive attitudes towards music (Wolf & Kopiez, 2018).

Overall, these studies suggest that students with high tonal aptitude tend to have greater musical ability and enjoyment, and they may benefit from music education programs that focus on developing their tonal skills. However, it's important to note that musical aptitude is not the only factor that contributes to musical success, and with practice and training, anyone can improve their musical abilities regardless of their natural aptitude.

Problem No. 3. Difference in the level of music aptitude of second-grade learners at Thai-Singapore International School in terms of tonal when grouped according to profile.

Table 3 Difference in the Level of Music Aptitude of Second-Grade Learners at Thai-Singapore International School in Terms of Tonal when grouped According to Profile

Profile Variable	Mean	Computed T-test Value	p-value	Decision	Interpretation
Gender					
Female	35	-0.843	0.401	Do not Reject the Null Hypothesis	Not Significant
Male	35.75				
Grade in Music					
Very Good	35.71	2.095	0.038	Reject the Null Hypothesis	Significant

Note: p-value ≤ 0.05 – significant, p-value > 0.05 – not significant

The table presents the results of a study on the difference in the level of music aptitude of second-grade learners at a Thai-Singapore International School, in terms of tonal, when grouped according to gender and grade in music. For the gender variable, the mean level of music aptitude for females is 35, while for males it is 35.75. The computed t-test value is -0.843, and the p-value is 0.401. Since the p-value is greater than 0.05, the null hypothesis is not rejected, which means that there is no significant difference in the level of music aptitude between females and males. Furthermore, for the grade in music variable, the mean level of music aptitude for learners with a very good grade in music is 35.71, while for learners with a good grade in music, it is 33.10. The computed t-test value is 2.095, and the p-value is 0.038. Since the p-value is less than or equal to 0.05, the null hypothesis is rejected, which means that there is a significant difference in the level of music aptitude between learners with a very good grade in music and learners with a good grade in music.

In summary, the study found that there is no significant difference in the level of music aptitude between females and males, but there is a significant difference in the level of music aptitude between learners with a very good grade in music and learners with a good grade in music.

There have been several studies examining the relationship between music achievement and music aptitude. One such study, published in the Journal of Research in Music Education, found a significant difference in music aptitude between learners with different levels of music achievement. The study involved a sample of high school students who were divided into three groups based on their level of music achievement. The high achievement group included students who had received an A or A+ in music, the medium achievement group included students who had received a B or B+ in music, and the low achievement group included students who had received a C or lower in music. The researcher administered the Seashore Measures of Musical Talents, a widely used test of music aptitude, to all three groups of students. He found that the high achievement group scored significantly higher on the test than the medium and low achievement groups. The researcher suggested that this difference in music aptitude may be due to a number of factors, such as differences in motivation, practice habits,

and exposure to music. The researcher also noted that the high achievement group may have had innate musical abilities that allowed them to excel in music more easily than the other groups (Reynolds, 2000).

Overall, this study suggests that there may be a significant relationship between music achievement and music aptitude. However, it is important to remember that musical ability is complex and multifaceted, and that individual differences within each group are likely to be much greater than any differences between groups.

Problem No. 4. Difference in the level of music aptitude of second-grade learners at Thai-Singapore School in terms of rhythm when grouped according to profile.

Table 4 Difference in the Level of Music Aptitude of Second-Grade Learners at Thai-Singapore International School in Terms of Rhythm when grouped According to Profile

Profile Variable	Mean	Computed T-test Value	p-value	Decision	Interpretation
Gender					
Female	31.91	-0.845	0.932	Do not Reject the Null Hypothesis	Not Significant
Male	31.99				
Grade in Music					
Very Good	32.17	1.301	0.195	Do not Reject the Null Hypothesis	Not Significant

Note: p-value ≤ 0.05 – significant, p-value > 0.05 – not significant

The table presents the results of a study conducted on the difference in the level of music aptitude of second-grade pupils at Thai-Singapore School in terms of rhythm, when grouped according to two profile variables: gender and grade in music. In addition, for the gender variable, the mean score for females is 31.91, and for males is 31.99. The computed paired t-test value is -0.845, and the p-value is 0.932. The decision is not to reject the null hypothesis, and the interpretation is that there is no significant difference in the level of music aptitude of second-grade pupils in terms of rhythm between females and males. Moreover, for the grade in music profile, the mean music aptitude score for pupils with a very good grade in music was 32.17, and for those with a good grade, it was 30.62. The computed paired t-test value was 1.301, and the p-value was 0.195. Since the p-value is greater than the significance level of 0.05, the null hypothesis is not rejected. Therefore, the difference in the level of music aptitude between pupils with very good and good grades in music in terms of rhythm is not significant.

While there are many studies that suggest a positive relationship between rhythm aptitude and music achievement, there are also some studies that have found no significant correlation between the two variables. For example, a study by Pembrook and Mueller (2013) found that while rhythm aptitude was positively correlated with certain aspects of music performance, such as timing accuracy, it was not significantly related to overall music achievement. Another study by Hébert and Poulin-Charronnat (2016) found that rhythm aptitude was not a significant predictor of music achievement in a sample of undergraduate music students. However, it is important to note that these studies had different sample sizes, study designs, and measures of music achievement, which may have contributed to the varying results.

Overall, while there are some studies that suggest a weak or non-significant relationship between rhythm aptitude and music achievement, the majority of research supports the notion that rhythm aptitude plays an important role in musical development and achievement.

Problem No. 5. Relationship between music aptitude and music achievement of second-grade learners at Thai-Singapore International School.

Table 5 Relationship Between Music Aptitude (Tonal and Rhythm) and Music Achievement (Grade) at Thai-Singapore International School

Variable	Computed Person r Value	Description	p-value	Decision	Interpretation
Music Aptitude (Tonal) vs Music Achievement	0.290	Weak Correlation	0.001	Significant	Reject the Hypothesis
Music Aptitude (Rhythm) vs Music Achievement	0.228	Weak Correlation	0.005	Significant	Reject the Hypothesis

Note: p-value ≤ 0.05 – significant, p-value > 0.05 – not significant

Based on the data provided, there is a weak positive correlation between music aptitude (tonal) and music achievement, with a computed Pearson r value of 0.290 and a p-value of 0.001, which is significant. This means that as music aptitude (tonal) increases, there is a tendency for music achievement to increase as well. However, the correlation is weak, which suggests that other factors may also contribute to music achievement. Similarly, there is a weak positive correlation between music aptitude (rhythm) and music achievement, with a computed Pearson r value of 0.228 and a p-value of 0.005, which is also significant. This suggests that as music aptitude (rhythm) increases, there is a tendency for music achievement to increase as well. However, like the previous correlation, the correlation is weak, indicating that other factors may also play a role in music achievement. Overall, based on the computed Person r values and p-values, we can conclude that there is a significant but weak positive correlation between both music aptitude (tonal and rhythm) and music achievement at the Thai-Singapore International School. However, other factors, such as motivation, practice, and instruction, may also contribute to music achievement, which should be further investigated to gain a more comprehensive understanding.

Research has shown that there is a weak correlation between music aptitude and music achievement. Music aptitude refers to the potential a person has to learn and perform music, while music achievement refers to the level of skill and knowledge a person has in music.

Studies have found that while there is some correlation between music aptitude and music achievement, the relationship is not very strong. For example, a study conducted by Corrigall and Trainor (2011) found that while there was a correlation between music aptitude and music achievement, it was not strong enough to predict music achievement on its own. Other factors, such as motivation, practice habits, and environmental factors, were found to be more important in predicting music achievement.

Another study by McPherson, Davidson, and Faulkner (2012) found that while music aptitude was a good predictor of initial music achievement, it did not necessarily predict long-term achievement. According to their study, other factors like motivation, practice routines, and possibilities for musical engagement were more crucial in predicting long-term music achievement.

Overall, even though there is a correlation between music aptitude and music achievement, it is not sufficient to predict success in music on its own. In addition to them, motivation, practice habits, and environmental factors are significant predictors of music achievement.

Problem No. 6: Prototype teacher-support materials developed and validated to help improve the level of music achievement of the second-grade learners at Thai-Singapore International School

Title: Prototype Teacher-Support Materials

Rationale: To develop a prototype teacher-support material for second-grade learners in the music subject, there is definitely a need for music educators to be aware of the students' music aptitude so that they are able to educate the learners to fully obtain their music potential. Addressing the needs of high-aptitude learners: Second-grade learners with a high level of music aptitude in terms of tonal and rhythm require differentiated instruction to ensure their needs are being met. The development of teacher-support materials specifically designed to target their needs can help these learners reach their full potential.

- Enhancing teaching quality: Providing teachers with additional support and resources can enhance their teaching quality and ultimately benefit all students, not just those with high music aptitude. When teachers have access to materials that have been validated through research, they can be more confident in their instruction and feel better equipped to meet the needs of all learners.

- Improving student outcomes: Developing and validating prototype teacher-support materials can lead to improved student outcomes in music achievement. When teachers have access to materials that have been designed to meet the needs of high-aptitude learners, they can create more effective lesson plans and deliver instruction that is engaging and challenging. This can lead to improved student motivation, participation, and ultimately achievement in music.

- Promoting innovation: Developing and validating prototype teacher-support materials is a creative and innovative approach to improving student outcomes. This approach encourages teachers to think outside the box and develop new strategies to meet the needs of high-aptitude learners. This can lead to the development of new teaching techniques and approaches that can benefit all students in the long run.

- Enhancing school reputation: Thai-Singapore International School can enhance its reputation as an institution that values and supports high-aptitude learners by investing in the development and validation of prototype teacher-support materials. This can help the school attract and retain high-aptitude students and foster a positive learning environment for all learners.

Implementing Guidelines:

Specific Objectives	**Activity**	**Definition**
1. Develop differentiated lesson plans that provide more challenging activities and assessments for students with a high level of tonal aptitude and scaffolded support for students with average rhythm aptitude.	Differentiated Lesson Plans	● These plans should include opportunities for students to explore more complex tonal structures while working on rhythm skills. (see appendices)
● Develop activities that specifically focus on rhythm skills, such as clapping exercises and drumming activities.	Rhythm-focused activities	● These activities should be engaging and age-appropriate and should provide opportunities for students to practice and develop their rhythm skills.
● Develop assessment tools that measure both tonal and rhythm skills separately, as well as together.	Assessment tools	● These tools should be aligned with the lesson plans and should measure students' understanding of both tonal and rhythm concepts.
● Provide audio and visual aids that support both the tonal and rhythm aspects of the lesson plans.	Audio and visual aids:	● These aids should be high-quality and should be used to enhance students' understanding of musical concepts.

DISCUSSION

Among the important findings of this research were:

1. The profile of the second-grade learners in terms of gender and term 1 grade in Music.

86% of the respondents received a grade of A*, which corresponds to a description of "Very Good." 14% of the respondents received a grade of A, which corresponds to a description of "Good." None of the respondents received a grade lower than B, which corresponds to a description of "Needs Improvement."

2. The level of music aptitude of second-grade learners in terms of tonal and rhythm.

Out of 148 respondents who took PMMA in terms of rhythm aptitude, 73% scored in the range of 31-40, which indicates a high level of music aptitude. 22% of the respondents scored in the range of 21-30, indicating an average level of music aptitude. Only 5% of the respondents scored 20 or below, indicating a low level of music aptitude. In addition, out of 148 respondents who took PMMA in terms of tonal aptitude, 87% scored in the range of 31-40, indicating a high level of music aptitude. 10% of the respondents scored in the range of 21-30, indicating an average level of music aptitude. Only 3% of the respondents scored 20 or below, indicating a low level of music aptitude.

3. The significant difference in the level of music aptitude of second-grade learners in terms of tonal when grouped according to profile.

There is no significant difference in the level of music aptitude between, but there is significant difference in the level of music aptitude between learners with a very good grade in music and learners with a good grade in music. The results of two t-tests were conducted to compare the mean level of tonal aptitude between the profiles of the respondents. The first t-test compares the mean level of tonal aptitude between genders. The computed t-test value is –0.843, and the p-value is 0,401. The null hypothesis is not rejected since the p-value is greater than 0.05, which means that there is no significant difference in the level of music aptitude between females and males. Moreover, the second t-test compares the mean level of tonal aptitude between Term 1 grades in music. The computed t-test value. Is 2.095, and the p-value is 0.038. The null hypothesis is rejected, which means that there is a significant difference in the level of music aptitude between learners with a very good grade in music and learners with a good grade in music.

4. The significant difference in the level of music aptitude of second-grade learners in terms of rhythm when grouped according to profile.

The study found that there is no significant difference in the level of music aptitude between females and males, based on the results of a paired t-test with a p-value of 0.932. This means that there is not enough evidence to conclude that gender plays a significant role in determining rhythm aptitude. However, there is a significant difference in the level of rhythm aptitude between learners with a very good grade in music and learners with a good grade in music. The results of a paired t-test with a p-value of 0.195 indicate that there is not enough evidence to reject the null hypothesis, suggesting that music achievement may be a more important factor in determining rhythm aptitude than gender.

5. The significant relationship between music aptitude and music achievement of second-grade learners at Thai-Singapore International School.

The study found that there is a weak positive correlation between music aptitude and music achievement at the Thai-Singapore International School. The computed Person r values of 0.290 and 0.228 for tonal and rhythm, respectively, indicate that as music aptitude increases, there is a tendency for music achievement to increase as well. The p-values of 0.001 and 0.005 for tonal and rhythm, respectively, indicate that these correlations are significant.

6. Prototype teacher-support materials were developed and validated to help improve the level of music achievement of the second-grade learners at Thai-Singapore International School

To develop prototype teacher-support materials for second-grade music learners, it is essential to consider students' tonal and rhythm aptitude, as the study found that while most learners demonstrated high aptitude, a meaningful portion showed average rhythm skills. These findings highlight the need for differentiated rhythm instruction, which is addressed in the materials through activities such as clapping and echo-pattern exercises, layered percussion tasks, movement-based rhythm games, and guided rhythm improvisation. By providing educators with these research-informed resources, they can more effectively challenge high-aptitude learners while supporting those still developing their skills, thereby enhancing teaching quality, promoting learner engagement and achievement, and fostering innovative instructional approaches that meet the diverse needs of all learners.

CONCLUSIONS

Based on the foregoing findings, the following conclusions were drawn:

1. The profile of the students suggests that the respondents performed well in Music in Term 1, with the majority receiving the highest possible grade. This information can be used to make decisions about future music programs, identify areas for improvement, and track progress over time.

2. The study suggests that the second-grade learners at Thai-Singapore International School may have stronger tonal aptitude than rhythm aptitude. However, it is important to note that the two aspects of music are interrelated, and overall music aptitude is a combination of both tonal and rhythm aptitude.

3. The findings of this study showed that gender does not play a significant role in determining tonal aptitude. However, there is a significant difference in music aptitude between learners with a very good grade in music and those with a good grade in music. This suggests that music achievement may be a more important factor in determining tonal aptitude than gender. It is important to note that further research may be needed to fully understand the relationship between music aptitude and music achievement, as well as the potential impact of other factors such as socio-economic status or musical training.

4. The findings of this study concluded that there is no significant difference in the level of rhythm aptitude between females and males, as there was no significant difference in the rhythm aptitude scores between the two groups. Additionally, the study found no significant difference in the level of music aptitude in terms of rhythm between learners with very good and good grades in music. Therefore, music achievement, at least in terms of rhythm, may not be a significant factor in determining music aptitude.

5. The study found a significant but weak positive correlation between music aptitude and music achievement at the Thai-Singapore International School, suggesting that while higher aptitude is somewhat associated with better achievement, it is not the sole factor influencing student performance. The weak correlation highlights the practical implication that music achievement depends on multiple factors beyond aptitude, including motivation, practice, instructional quality, and classroom environment. Therefore, teacher-support materials and instructional strategies should be designed to address the diverse needs of learners, rather than relying solely on aptitude levels. Additionally, because the study was conducted in a single private international school with a specialized curriculum and abundant resources, the findings may not be fully generalizable to other educational contexts with different curricula, class sizes, or resource availability. Nonetheless, these results provide useful guidance for future research and for the development of differentiated music education programs that support both tonal and rhythm skill development across a range of learners.

RECOMMENDATIONS

In light of the conclusions drawn from the study, the following are hereby recommended:

1. It is recommended to create a prototype teacher-support material that is specifically designed to elevate the level of music aptitude among second-grade learners. This will likely result in an improvement in their music achievement, which can be observed in their music grades at the end of each term.

2. There is a need for music educators who conduct music aptitude tests with learners and evaluate the results more systematically. The musical progress of a learner should be recorded for easy reference. The music achievement of a learner should be tracked, and parents must also be kept informed for they to see how their children are progressing in their music lessons. This provides both music educators and parents with objective guidance to help primary school learners develop and maximize their music aptitude through appropriate music instruction and opportunities.

3. Thai-Singapore International School may consider organizing more music-related activities and initiatives, such as establishing a children`s choir in the lower primary level to provide an excellent platform for children to perform and experience music in a hands-on setting outside of music classes.

4. The prototype teacher-support materials developed by the researcher should be validated in the school, approved by the school head, and used in the school.

5. Future researchers may consider conducting a similar study using another group of respondents from other international and local schools to compare results. Other variables can be explored to find out possible significant relationships, as well as other factors predicting music aptitude.

Compliance with Ethical Standards

The researcher ensures honesty and integrity by not misleading anyone with the data gathered and used in the study for future reference. Objectivity was maintained in all aspects of the study, including design, data analysis, interpretation, and peer review. Any personal or financial interests that may influence the study were disclosed. The researcher also acknowledges the works of the authors and ensures that there is no plagiarism in the study by properly citing all literature and studies. In addition, confidentiality and human subjects' protection were prioritized. The personal information of the respondents was treated with confidentiality, and their right to privacy and autonomy was respected. Parents were informed and approached for their consent through a letter stating that their child had been chosen for the study.

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