# Effects Of Musical Instrument Engagement in The Motor Skills Enhancement of The Learners With Exceptionalities

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*Abstract* — This study evaluated the effects of musical instrument engagement on the motor skills of learners with exceptionalities from Ormoc City Special Education Integrated School in Leyte, Philippines during the 2022-2023 school year. The research aimed to address sub-problems related to learners' profiles, level of engagement, extent of motor skill enhancement, and potential differences in evaluation by SpEd teachers and parents/guardians. The study employed a descriptive-correlation design, adopted a questionnaire, and used purposive sampling. Only 79 out of 152 Learners with Exceptionalities (LEs) were sampled, along with their respective parents and SpEd Teachers as respondent groups. Data were analyzed using simple percentage, weighted mean, regression analysis, and correlation coefficient.

The results showed that most LEs belonged to the Latent and Early Adolescence stages, and more males were sampled than females. Additionally, LEs' engagement in musical instruments was rated as "moderate," with more interest in drumming. The motor skills of LEs were appraised as "fairly enhanced," with significant differences between the evaluations of parents/guardians and SpEd teachers. The study found that musical instrument engagement had a highly statistically significant effect on enhancing LEs' motor skills. The study recommends the use of a Sustainable Musical Instrument Training Plan and further investigation of confounding variables that may hinder or facilitate the development of motor skills in LEs. Overall, the study highlights the importance of incorporating musical instrument engagement as a means to enhance motor skills in LEs.

***Keywords — Learners with Exceptionalities, Musical Instrument Engagement Motor Skills Development, Descriptive-Correlation Design, Ormoc City, Philippines***

## I. Introduction

Every student, whether with exceptionalities or not, can similarly learn the basic concepts but may vary on the ways how these ideas shall be acquired. Some of them may take a longer time to grasp the concepts. This condition is so vital to note among the Special Education (SpEd) teachers particularly in facilitating the most essential competencies among the Learners with Exceptionalities (LEs). With various concerns on how to effectively management an instruction, SpEd teachers are tempted to conventionally facilitate the lessons. It should be reflected that there are other crucial matters that should be equally looked into to accordingly respond to the special needs of these LEs while inside the classroom.

The unavailability of service providers (e.g. Speech Pathologist, Occupational Therapist and Physical Therapist) at school to intervene the motor skills enhancement among these Les is a concern. In fact, a large class size and lack of classroom facilities (e.g. manipulatives, sensory and digital tools, etc) are also adding up to the earlier identified issue aside from the inadequate training among SpEd teachers. The limited understanding on how to utilize the Individualized Education Plan (IEP) in carrying out the lessons and tasks has likewise make things more challenging when addressing the motors skills enhancement.

Indeed, enriching the LEs' motor skills is a salient aspect that must be taken into consideration to ensure that the intended outcomes involving such matter, which were established in the curriculum guide, are met. As observed, some SpEd teachers in the researcher's home country focused on the cognitive formation of the LEs than in their motor skills development. The latter aim, to some extent, has been missed out or had not been given full attention yet during or after the actual holding of classes. As noticed, academic evaluations were often done in a pencil and pen test than having the performance tests, which could appraise the psychomotor domain of these LEs.

For many years in teaching the LEs in the Philippines, not in many instances that SpEd teachers work on the motor skills development due to the earlier mentioned factors. These identified limitations disclose a parallel scenario, too, among the other public and private schools that have offered a special education program. The absence of needed facilities, tools and specialized training have affected the dynamics of instruction and the achievement of the outlined objectives and tasks set therein. Hence, this impels one to embrace creativity to scholastically intervene the development of the LEs motor skills.

With actual training in music, exposures to instrument and related arts, the researcher decided to introduce these LEs in the utilization of musical instruments (e.g. guitar, drums, and violin) to hopefully develop their motor skills. At the preliminary stage of this alternative instruction, although the challenge was high, a positive outcome was observed among those LEs, who have engaged in such dynamics. Their interest, while engaging in the utilization of these musical instruments, is noticeably better that when they were just taking the class works and their

self-confidence was built up to an acceptable extent even with such disabilities. In fact, some of these LEs join and became choir members as well as participated in the singing contests.

The foregoing, indeed, has triggered a choice to empirically scrutinize the effect of musical instrument engagement among these LEs in the enhancement of their motor skills. It is, also, the aim of the recent study to formulate a particular intervention plan, whether the engagement has influenced or not on the enhancement of their motor skills for eventual sharing to scientific community.

This research evaluated the effects of musical instrument engagement in the motor skills enhancement of the learners with exceptionalities from Ormoc City Special Education Integrated School in the western part of Leyte, Philippines during the school year 2022– 2023 as basis for a Sustainable Musical Instrument Training Plan.

It specifically sought to answer the following sub-problems, namely:

1. What is the profile of the subjects as to the following:

    1.1 age and gender,

    1.2 categories of exceptionalities, and

    1.3 types of musical instrument engagement?

2. What is the level of engagement that the subjects have with a musical instrument as perceived by the SpEd teachers and their parents or guardians?

3. To what extent are the motor skills of the subjects who engage in a musical instrument enhanced as evaluated by the SpEd teachers and their parents or guardians?

4. Is there a significant effect in the level of engagement of the subjects in musical instrument and the extent of enhancement in their motor skills?

5. Is there a significant difference between the evaluations made by the SpEd teachers and parents or guardians as to the level of engagement in musical instruments and the extent of enhancement in the motor skills of the LEs?

6. Based on the findings of the study, what Sustainable Musical Instrument Training Plan has been formulated?

Statement of Hypothesis

Ho1: There is no significant effect in the level of engagement of the respondents in musical instrument and the extent of enhancement on their motor skills.

Ho2: There is no significant difference between the evaluations made by the SpEd teachers and parents or guardians as to the level of engagement in musical instruments and the extent of enhancement in the motor skills of the LEs?

## II. Methodology

***Design.*** This part discussed the research design appropriate for such scientific intent, the flow of the study, chosen locale, respondents, and research instruments to be used. Included in this portion was the data gathering procedures, statistical treatment and scoring procedures. This study employed a descriptive-correlation design which utilizes a survey method in gathering the needed information from the respondents. Such design is appropriate for use since the established research problem points to its intent to establish a possible association between the engagement of the LEs in musical instrument and the extent of enhancement on their motor skills. The use of this design appropriates such intent to infer the research variables since it describes either their association or difference which occurs naturally between them (Bakar, 2018). An Input-Process-Output (IPO) model was adopted in this empirical work as it will subject those important information or data to undergo technical processing in order to come up a proposal as an output that will correspondingly acts on those areas with concern. The Input box reflected in the profile of the SpEd teacher-respondents, level of engagement in musical instrument, the extent of enhancement on the motor skills of these LEs and the test of significance on the effect of the engagement of musical instrument and the extent of enhancement in the motor skills. Additionally, the Process box laid down the things to be done prior, during and after these warranted details are taken in. At the same time, the gathered information underwent procedural inferences to derive the results. With the results, the Output box therefore displayed the possible proposal, formulation and the like.

***Sampling***. With respect to the intelligence of the LEs, somehow, the researcher so chose the SpEd teachers to participate as respondents to the recent study since they are in better position to technically assess the level of engagement of the LEs in musical instrument. Guided by the survey indicators and established pointers from their formal education, expanded training, and relevant references, these SpEd teachers were also the appropriate persons to evaluate the extent of enhancement in their motor skills. For this part, the purposive sampling was considered in taking in the needed samples from the 152 LEs as respondents to the current study. There were 57 males and 22 females with a total of 79 respondents, and the primary means of reach is during the actual conduct of the study as well as during the gathering of data in the school where the study was conducted.. Another way of contacting them are through cell phones of their respective parents.

***Research Procedure***. Preliminary Stage. Prior to the actual conduct of the survey in the identified locale, the letter of request was sent to the Schools Division Superintendent of the Department of Education from East Visayas through the Office of District 1 to seek approval to undertake the scientific study. As a protocol, a letter of request has been transmitted to the Principal of Ormoc City SpEd Integrated School through the Master Teacher of the SpEd Program, this time

asking for their consent to allow the conduct of the study in such locale and the administration of the survey questionnaire among the identified respondents – the SpEd teachers.

Data Gathering Stage. Once the concerned letters were all approved, the conduct of survey shall commence. During the actual administration of the questionnaire, the researcher ensured that Informed Consents are duly signed by the respondents and the parents or guardians of these LEs. This is made to fundamentally observe the established ethical standards in the administration of any survey. After such verifications that these consents are now signed, briefing the respondents on how to accomplish the questionnaire and the duration that the survey may take has followed.

Included in this part was the assurance that the provisions stipulated in the Data Privacy Act have been fully observed particularly in that part that all information shared by the respondents had been treated with utmost confidentiality. Additionally, crucial information related to the LEs must be carefully and tactfully disclosed in the entirety of the process to guard their privacy. Thus, it very vital that the respondents, parents or guardians and the concerned LEs should be notified, as part of an ethical protocol, that no risks or dangers are involved in the current undertaking.

Post Data Gathering Stage. Upon completion of the foregoing, the raw data have been retrieved, collated, tabulated before they were statistically treated. From such processes, once the scientific results are obtained they were analyzed and interpreted before their presentation.

***Ethical Issues***. The right to conduct the study was strictly adhered through the approval of the principal, approval of the Superintendent of the Division. Orientation of the respondents both the learners and the teachers including the School Principal was done.

***Treatment of Data***. Prior to data analysis, the gathered information from the survey had been treated using the appropriate statistical tools to provide the needed scientific results. Hence, the following were the tools to be utilized, namely:

Simple percentage. This is a fundamental mathematical tool was used to derive the computed proportion in the respondents' profile (e.g. age and gender, categories of exceptionalities and types of musical instrument).

Frequency Count. Such inventory refers to the process of counting the number of times a particular item or even occurs in a given set of data or population. Such recording was utilized in all data gathered from the survey that were tabulated.

Likert Scale. This tool is a commonly used psychometric rating scale that measures attitudes, opinions, or perceptions on a range of response options, typically ranging from strongly agree to strongly disagree. However, for the recent work, it was used for survey taking on the questionnaires provided to the respondents.

Weighted Mean. For those scaled interval data which shall be taken from the responses in a survey for both sub-variables on the level of engagement in musical instrument and extent of

motor skills enhancement, this tool is proper. Average Weighted Mean. This refers to the average computation of the weighted means for all concerned indicators of a given survey for such research variables under scrutiny (e.g. level of engagement in musical instrument and extent of motor skills enhancement).

Regression Analysis. This test looks for the cause-and-effect relationship for one or more continuous variables on another variable. With the intent to test if there is significant effect in the LEs level of engagement in musical instrument on the extent of their motor skills enhancement, the use of this statistical tool was right.

t – test for Two Independent Sample. This tool is used to compare the means of two respondent-groups that are not related to each other, namely the SpEd Teachers and the parents or guardians of the LEs. It is often used to determine if there is significant difference between two groups' evaluations on the identified sub-variables in the current study.

## III. Results and Discussion

**Table 2**
**Age and Gender of the Respondents (n=79)**

| Age (in years) | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % |
| 25 & above | 1 | 1.27 | 1 | 1.27 | 2 | 2.54 |
| 20 – 24 | 2 | 2.53 | 5 | 6.33 | 7 | 8.86 |
| 15 – 19 | 12 | 15.19 | 2 | 2.53 | 14 | 17.72 |
| 10 – 14 | 11 | 13.92 | 8 | 10.13 | 19 | 24.05 |
| 5 – 9 | 31 | 39.24 | 6 | 7.59 | 27 | 46.83 |
| Sub-total | **57** | **72.15** | **22** | **27.85** | **79** | **100.00** |

The table shows the distribution of age and gender among the respondents. The total number of respondents is 79, with 57 (72.15%) males and 22 (27.85%) females. The age of the respondents ranges from 5 to above 25 years old. The age distribution shows that the majority of the participants fall within the age range of 5-14 years old, with 46.83% of the respondents belonging to this age group. This age range is critical in the development of motor skills, and the study may have significant implications for learners with exceptionalities within this age group.

The gender distribution shows that there are more male participants (72.15%) than female participants (27.85%). While this may limit the generalizability of the findings to females, it is essential to note that the study aims to examine the effects of musical instrument engagement on motor skill enhancement, regardless of gender. Hence, the analysis of the age and gender distribution among the respondents suggests that the study may provide valuable insights into the effects of musical instrument engagement on the motor skills enhancement of learners with exceptionalities within the age range of 5-14 years old, regardless of gender.

Age and gender are crucial variables in the recent study because they can influence the results of the research. Age can affect motor skill development, with younger individuals having more plasticity and adaptability in their motor abilities. Moreover, older individuals may have more difficulties in learning new motor skills due to age-related changes in the brain and body. In the context of learners with exceptionalities, age may also affect the severity and type of exceptionalities, which can affect their motor skill development (Benda et al., 2021). Therefore, age should be considered as a variable in the research study to determine the age range where musical instrument engagement can be most effective in enhancing motor skills of learners with exceptionalities.

Gender is another important variable in the research study as it may affect the way individuals engage in musical activities and develop motor skills. Studies have shown that gender differences exist in the development of fine motor skills, with females having more precise and coordinated fine motor movements than males. Additionally, gender stereotypes may influence the type of musical instruments learners with exceptionalities are interested in and the level of engagement they have in musical activities (Rose et al., 2019). Thus, gender should be considered in the research study to understand the potential gender-specific effects of musical instrument engagement on motor skill enhancement of learners with exceptionalities.

Categories of Exceptionalities

Understanding the categories of exceptionalities is essential for conducting effective and ethical research on interventions for learners with special needs, particularly in the area of motor skill enhancement. By considering the unique needs of each category, researchers can tailor their interventions to meet the specific needs of learners, establish valid control groups, ensure ethical practices, and generalize their findings to a broader population. Thus, the table exhibits the various exceptionalities for such intent.

**Table 3**
**Categories of Exceptionalities**

| Categories | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % |
| ASD Level 1 | 19 | 24.051 | 2 | 2.532 | 21 | 26.583 |
| ASD Level 2 | 4 | 5.063 | 1 | 1.266 | 5 | 6.329 |
| ID Level 1 | 14 | 17.722 | 4 | 5.063 | 18 | 22.785 |
| ID Level 2 | 8 | 10.127 | 6 | 7.595 | 14 | 17.722 |
| Trans Acad. | 4 | 5.063 | 4 | 5.063 | 8 | 10.126 |
| Trans Indep. | 4 | 5.063 | 3 | 3.797 | 7 | 8.860 |
| Visual Imprd. | 4 | 5.063 | 2 | 2.532 | 6 | 7.595 |
| Sub-total | **57** | **72.152** | **22** | **27.848** | **79** | **100.00** |

Legend: **ASD** refers to Autism Spectrum Disorder; **ID** shall mean Intellectual Disability; **Trans Acad.** refers to Transition Academic; **Trans Indep** means Transition Independent Living; **Visual Imprd** refers to Visually Impaired.

The data presented in Table 3 can be analyzed in several ways to investigate the effects of musical instrument engagement in the motor skills enhancement of learners with exceptionalities. One way is to examine the relationship between the type of exceptionality and the gender of the learners. Another way is to explore the distribution of the different categories of exceptionalities among the participants.

First, we can observe that there were 57 male learners (72.152%) and 22 female learners (27.848%) in the study. This gender imbalance should be taken into consideration when interpreting the results. For example, if there is a significant difference between male and female learners in terms of the effects of musical instrument engagement on motor skills enhancement, it could be due to the unequal sample size.

Next, we can examine the distribution of the different categories of exceptionalities among the participants. The highest number of learners were in the ASD Level 1 category, with 21 learners (26.583%). This was followed by the ID Level 1 category, with 18 learners (22.785%). The lowest number of learners were in the Visual Imprd. category, with only 6 learners (7.595%). This distribution indicates that the majority of the participants had ASD or ID, which could influence the generalizability of the findings to other exceptionalities.

The categories of exceptionalities play a critical role in determining the effectiveness of interventions for learners with special needs, particularly in the area of motor skill enhancement. By understanding the different categories of exceptionalities, researchers can tailor their

interventions to meet the specific needs of learners, resulting in more successful outcomes (Patel et al., 2022). For example, learners with physical disabilities require different interventions than those with developmental or intellectual disabilities.

In the context of this current study, understanding the categories of exceptionalities is particularly important because it can help researchers identify which learners are most likely to benefit from musical instrument engagement. Learners with exceptionalities can be grouped into categories such as autism spectrum disorder, cerebral palsy, Down syndrome, and more. Each category requires a specific approach to intervention, and musical instrument engagement may be more effective for certain categories than others (Freer, 2021).

Furthermore, understanding the categories of exceptionalities is critical for ensuring ethical research practices. Researchers must consider the potential risks and benefits of their interventions for each category of exceptionalities. For example, some learners with exceptionalities may be more vulnerable to harm from certain interventions, and researchers must take steps to mitigate these risks. By understanding the categories of exceptionalities, researchers can ensure that their interventions are both effective and safe for all learners (Lambert, 2021).

Lastly, knowledge of the categories of exceptionalities is crucial for generalizing research findings to a broader population. By understanding the different categories and their unique needs, researchers can design interventions that are applicable to a wider range of learners with exceptionalities. This can help ensure that the benefits of musical instrument engagement are available to all learners, regardless of their specific exceptionalities (Fontil et al., 2020). Indeed, the foregoing disclosure vital in the quest of understanding the various exceptionalities for their appropriate approaches for motor skills interventions.

Type of Musical Instrument Engagement

Including the type of musical instrument in the current research is vital as it provides essential information on a specific intervention to be employed. Knowingly, different musical instruments require varying degrees of fine and gross motor skills, and the type of instrument used can impact the motor skills development of special education students differently. Therefore, including the type of musical instrument ensures that the study's focus is clear and specific, allowing for more accurate and relevant research outcomes. Hence, the table reveals the different musical instruments that the Subjects were exposed to.

**Table 4**
**Test of Difference Between the Scores in the Pre-test and Post-test of Grade 8 Students in Control and Experimental Group**

| Type of Instruments | Observed by SpEd Teachers | | Observed by Parents/Guardians | | Total | |
|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % |
| Guitar | 13 | 7.14 | 13 | 7.14 | 26 | 14.28 |
| Drum | 61 | 33.52 | 61 | 33.52 | 122 | 67.04 |
| Violin | 1 | 0.55 | 1 | 0.55 | 2 | 1.10 |
| Others* | 16 | 8.79 | 16 | 8.79 | 36 | 17.58 |
| Subtotal | **91** | **50.00** | **91** | **50.00** | **182** | **100.00** |

Legend: Others* shall refer to tambourine, maracas and keyboards

The table presents data on the types of musical instrument engagement observed by special education (SpEd) teachers and parents/guardians of learners with exceptionalities. The total number of learners observed was 182, with an equal percentage (50%) of observations made by SpEd teachers and parents/guardians. The data reveals that drum engagement was the most popular among the observed learners, with a frequency of 122 (67.04%) out of the total observations. Guitar engagement was observed in 26 learners (14.28%), followed by other instruments with a frequency of 36 (17.58%). The least observed instrument was violin with only two learners (1.10%) engaging with it.

The high frequency of drumming engagement observed by both SpEd teachers and parents/guardians indicates its popularity and effectiveness. Drumming requires the synchronization of body movements with rhythm, thus improving coordination and motor skills. Learners who engage in drumming may also benefit from the physical exercise involved, which can enhance their physical fitness and overall health (Lowry et al., 2019).

On the other hand, the relatively low frequency of guitar and violin engagement in this study may suggest that these instruments are less effective in enhancing motor skills among learners with exceptionalities. However, it is important to note that these instruments require a different set of motor skills compared to drumming, such as finger dexterity and hand-eye coordination. Learners who engage in guitar or violin playing may benefit from these specific motor skills, which can enhance their fine motor skills and hand-eye coordination (Kelly, 2020).

The scientific results from this table have important implications for educators, parents, and therapists working with learners with exceptionalities. The popularity and effectiveness of drumming engagement suggest that it can be a valuable tool for enhancing motor skills among these learners (Lowry et al., 2019). Educators, parents, and therapists should consider

incorporating drumming activities into their teaching and therapy programs. However, it is important to note that each learner is unique and may benefit from different types of musical instrument engagement. Therefore, educators, parents, and therapists should assess the individual needs and preferences of each learner and tailor their engagement accordingly.

Additionally, the results of this study provide evidence that musical instrument engagement, specifically drumming, can be an effective tool for enhancing motor skills among learners with exceptionalities. The popularity and effectiveness of drumming engagement observed in this study suggest that it should be considered as a valuable tool for educators, parents, and therapists working with learners with exceptionalities. However, the individual needs and preferences of each learner should be taken into consideration when selecting the type of musical instrument engagement (Cibrian et al., 2020).

**Table 5**
**Level of Engagement that the Subjects have with a Musical Instrument as evaluated by the SpEd Teachers and their Parents of Guardians**

| No. | Indicators | Teachers | | Parents | |
|---|---|---|---|---|---|
| | | x | VI | X | VI |
| 1 | Learners show interest while performing their respective musical instrument during training and/or practice. | 3.6 | H | 3.3 | M |
| 2 | Learners participate in many ways in the planning of activities (e.g. instrument and singing practices, etc.). | 3.1 | M | 2.9 | M |
| 3 | Learners learn how to play the instruments (e.g. guitar, drum, violin, etc.) in flourishing manner when in our group. | 2.9 | M | 2.8 | M |
| 4 | Learners' engagement in the use of instrument and play music is an important aspect in their everyday affairs. | 3.1 | M | 3.0 | M |
| 5 | Learners have been given possibilities or opportunities to join group-based events/activities (e.g. choir singing, etc.) | 3.3 | M | 3.1 | M |
| 6 | Learners' preference of a particular musical instrument is the starting point in their engagement activities | 3.1 | M | 3.0 | M |
| 7 | Learners develop their playing of instrument(s) and motor skills after few weeks of their engagement. | 3.0 | M | 2.9 | M |
| 8 | Learners can well identify the inventory of musical instrument within the practice hall. | 2.7 | M | 2.7 | M |
| 9 | The learner can perform the assigned musical instrument alone or even without the supervision of a coach. | 2.6 | M | 2.5 | L |
| 10 | Learners definitely interact among themselves as to the aspects of musicality during and after a scheduled session. | 2.8 | M | 2.7 | M |
| | **Average** | **3.0** | **M** | **2.9** | **M** |

*Legend: 4.20-5.00 Extremely High (EH); 3.40-4.19 High (H); 2.60-3.39 Moderate (M); 1.80-2.59 Low (L); 1.00-1.79 Extremely Low (EL)*

The table above presents the results of the evaluation of the level of engagement that the subjects have with a musical instrument, as rated by their special education (SpEd) teachers and parents/guardians. The evaluation is composed of ten indicators, such as learners' interest, participation in planning activities, and motor skill development. The average ratings for both groups are moderate, with the teachers' average slightly higher than the parents' average. These results suggest that learners with exceptionalities show some interest and engagement in playing musical instruments, but there is still room for improvement.

Indicators 3 and 7 are particularly relevant. These indicators suggest that learners develop their playing of instruments and motor skills after a few weeks of engagement, and they learn how to play the instruments in a flourishing manner when in a group. These results support the thesis that musical instrument engagement can have a positive effect on motor skill enhancement among learners with exceptionalities. Also, Indicator 1, which measures learners' interest in playing their musical instruments during training and practice, is also relevant. The rating of 3.6 by the teachers and 3.3 by the parents indicates that learners have some interest in playing their instruments. However, this interest may not be sufficient to sustain their engagement in the long term, and more motivation may need to be provided to encourage continued engagement.

Moreover, Indicators 2, 4, 5, 6, and 10 are related to learners' participation in planning and group-based activities. These indicators suggest that learners have some level of engagement in group activities related to music, but the ratings are only moderate. This implies that there is potential for improvement in learners' engagement and participation in group activities related to music, which could also have a positive impact on their motor skill enhancement. Furthermore, Indicators 8 and 9, which measure learners' ability to identify musical instruments and perform them alone, although these indicators may seem less relevant to the current study, however, they are still important for learners' overall musical development.

Thus, the scientific results from Table 5 suggests that learners with exceptionalities show some interest and engagement in playing musical instruments. However, there is still room for improvement in their engagement and participation in group activities related to music. The results also support the thesis that musical instrument engagement can have a positive effect on motor skill enhancement among learners with exceptionalities. Indicators 3 and 7 in particular suggest that learners can develop their playing of instruments and motor skills after a few weeks of engagement. Overall, these results provide insights into the potential benefits of musical instrument engagement for learners with exceptionalities and highlight areas for further improvement (Burland, 2020).

Learners with exceptionalities, such as those with physical or cognitive disabilities, often struggle with fine and gross motor skills development. Engaging in musical instrument training can significantly enhance their motor skills, providing numerous advantages that can improve their daily lives (Gustavson et al., 2021). The advantage of musical instrument training for learners with exceptionalities is the development of hand-eye coordination. Many instruments require the use of

both hands in playing. Learning to play an instrument involves coordinated movements of both hands, which, with practice, leads to improved hand-eye coordination. This coordination can translate to other activities, such as writing, typing, and manipulating objects, which are essential daily living skills. Engaging in musical instrument training enhances finger dexterity, which is essential in playing many instruments. Learners with exceptionalities, such as those with physical disabilities, can benefit greatly from finger dexterity training, which can improve their ability to handle objects and engage in fine motor activities (Gustavson et al., 2021). The repetitive movements required to play musical instruments can strengthen the fingers and improve their dexterity, leading to better fine motor control.

Learning to play a musical instrument can improve balance and coordination. Some instruments, such as drums, require the use of the feet in addition to the hands, promoting balance and coordination. Engaging in musical instrument training can improve learners' balance and coordination, leading to better control of their bodies and improved daily living skills. Additionally, musical instrument training can help learners with exceptionalities develop a sense of rhythm, which is essential for many instruments' playing. Rhythm training can also improve gross motor skills, such as dancing and walking, as learners develop a better sense of timing and coordination (Alegrado & Winsler, 2020).

Musical instrument training can be an enjoyable and fulfilling activity for learners with exceptionalities. Engaging in musical activities can boost their self-esteem and confidence as they develop new skills and improve existing ones. The sense of accomplishment that comes with mastering an instrument can positively impact learners' motivation and inspire them to engage in other activities that promote their overall well-being. Indeed, learners with exceptionalities can benefit significantly from engaging in musical instrument training. The development of hand-eye coordination, finger dexterity, balance, coordination, and rhythm can improve their motor skills and enhance their daily living skills. Additionally, musical instrument training can be an enjoyable and fulfilling activity that boosts learners' self-esteem and motivation (Lense, & Camarata, 2020). Apparently, this condition has truly been noticed by the researcher at her previous work station while she is still employed in her home country many years ago. This drives her to have the recent study investigated.

**TABLE 6**
**Extent of motor skills of the Subjects who engaged in a Musical Instrument are enhanced as evaluated by the SpEd Teachers and their Parents of Guardians**

| No. | Indicators | Teachers | | Parents | |
|---|---|---|---|---|---|
| | | X | VI | x | VI |
| 1 | Grasp or hold the drum stick | 2.9 | ME | 2.1 | FaE |
| 2 | Hit or bang the drum to a beat or 2/3 | 2.6 | ME | 2.1 | FaE |
| 3 | Strum the strings | 2.5 | ME | 1.9 | FaE |
| 4 | Enhance hand-eye coordination | 2.6 | ME | 2.0 | FaE |
| 5 | Become familiar with rhythm or beat | 2.2 | FaE | 1.8 | FaE |
| 6 | Become acquainted with melody | 2.2 | FaE | 1.9 | FaE |
| 7 | Improves coordination or dexterity | 2.3 | FaE | 1.8 | FaE |
| 8 | Improves timing | 2.3 | FaE | 1.8 | FaE |
| 9 | Improves concentration | 2.4 | FaE | 1.7 | NE |
| 10 | Hold the bow accurately (violin) | 1.8 | FaE | 1.5 | NE |
| 11 | Pluck the strings (guitar) | 2.0 | FaE | 1.6 | NE |
| 12 | Control his/her movements | 2.4 | FaE | 1.8 | FaE |
| | **Average** | **2.4** | **FaE** | **1.8** | **FaE** |

Legend: 3.25-4.00 Fully Enhanced (FuE); 2.50-3.24 Moderately Enhanced (ME); 1.75-2.49 Fairly Enhanced (FaE); 1.00-1.74 Not Enhanced (NE)

Table 6 shows the results of an evaluation of the motor skills enhancement of subjects who engaged in a musical instrument as evaluated by special education (SpEd) teachers and their parents or guardians. The indicators in the table relate to specific skills such as grasping or holding drum sticks, hitting or banging drums to a beat, and strumming guitar strings, among others.

The results show that the average rating for all indicators was higher for parents than for SpEd teachers. However, both groups rated the enhancement of motor skills as moderate to fairly enhanced. The highest rated indicators were "grasp or hold the drum stick" and "hit or bang the drum to a beat or 2/3," both of which were rated as moderately enhanced by SpEd teachers and parents. The table also shows that some indicators were rated differently by SpEd teachers and parents. For instance, "become familiar with rhythm or beat," "become acquainted with melody,"

and "improves coordination or dexterity" were rated as FaE by parents but rated as not enhanced by SpEd teachers. In contrast, "hold the bow accurately (violin)" and "pluck the strings (guitar)" were rated as not enhanced by parents but rated as FaE by SpEd teachers.

The involvement of learners with exceptionalities in musical instrument engagement can benefit from the data analysis of Table 6. The results suggest that engaging in musical instrument playing can help develop motor skills such as hand-eye coordination, timing, and control of movements. However, there is variability in the enhancement of motor skills among different instruments and among different raters. Therefore, educators and parents should carefully choose the instrument to be used and consider the individual needs and abilities of learners with exceptionalities (Ku et al., 2020).

Moreover, the table highlights the importance of using multiple sources of evaluation, such as both SpEd teachers and parents or guardians, to provide a more comprehensive understanding of the learner's progress. This information can be used to develop personalized goals and strategies for learners with exceptionalities, which can help maximize their potential and enjoyment of musical instrument engagement. Moreover, the table highlights the importance of using multiple sources of evaluation, such as both SpEd teachers and parents or guardians, to provide a more comprehensive understanding of the learner's progress. Somehow, this information can be utilized to develop personalized goals and strategies for learners with exceptionalities, which can definitely help maximize their potential and enjoyment of musical instrument engagement (Murphy & Risser, 2022).

The development of motor skills is essential for individuals with exceptionalities (e.g. those with intellectual or developmental disabilities) because it enables them to perform daily activities independently. Motor skills include fine motor skills, such as the ability to hold a pencil and write, and gross motor skills, such as walking, running, and jumping. For individuals with exceptionalities, motor skill development is often more challenging, but it is crucial to their overall development and independence (Ketcheson et al., 2021).

Motor skill development can enhance an individual's physical and mental health. Regular physical activity through motor skill development can reduce the risk of obesity and related health issues, such as heart disease and diabetes. Additionally, physical activity can improve mental health by reducing stress, anxiety, and depression. For individuals with exceptionalities, motor skill development can also improve their confidence and self-esteem by allowing them to engage in physical activities alongside their peers (Ketcheson et al., 2021).

Additionally, motor skill development can also enhance an individual's academic performance. Fine motor skills are essential for writing, drawing, and manipulating small objects, which are necessary for academic success. Gross motor skills, such as coordination and balance, can improve an individual's ability to focus, sit still, and concentrate in the classroom. Furthermore,

physical activity can improve brain function and memory, which can positively impact academic performance (Murphy & Risser, 2022).

Moreover, motor skill development can also improve an individual's social skills. Physical activity provides opportunities for individuals with exceptionalities to interact with their peers in a structured environment. Group physical activities, such as sports and games, promote teamwork, communication, and cooperation. These social skills are essential for individuals with exceptionalities to build relationships and develop a sense of belonging within their community (Ku et al., 2020).

Thus, the development of motor skills is critical for individuals with exceptionalities. It improves their physical and mental health, academic performance, and social skills. Motor skill development can empower individuals with exceptionalities to be more independent, confident, and active members of their community. Therefore, it is essential to prioritize motor skill development for individuals with exceptionalities to promote their overall well-being and success. The researcher shares the same thoughts with the foregoing assertions by those authorities in such field and further posits the essentiality of educative focus on such matters.

**TABLE 7**
**Test of Significance on the Effect of Level of Engagement of the Subjects in Musical Instrument and the Extent of Enhancement in their Motor Skills**

| Variables under Inference | df | Comp. R | Comp. $R^2$ | Comp. F-value | *p*-value | Results | Decision |
|---|---|---|---|---|---|---|---|
| (*a*) Engagement of Instrument and its effects on the (*b*) LEs Motor Skills Enhancement of the LEs | 78 | 0.721 | 0.521 | 83.604 | $0.000^a$ | The result is highly statistically significant | Accept Ha |

Legend: The "*a*" shall be the predictor (Constant) while "*b*" is the dependent variable.

The scientific results from the table concerning the use of regression analysis appears to be a statistically significant effect of the predictor variable on the dependent variable. The total degree of freedom (df) of 78 indicates the number of observations that were used in the regression analysis and the number of predictors that were included in the model which explains that a higher df can provide a more reliable results of the analysis.

Accordingly, the R-value of 0.721 indicates a moderate to strong positive correlation between the predictor and dependent variable. This entails that as the predictor variable increases, the dependent variable tends to increase as well. Likewise, the R-square value of 0.521 indicates that 52.1% of the variation in the dependent variable can be explained by the predictor. In other words, the predictor has some degree of explanatory power over the dependent variable, but there is still a significant amount of variation in the dependent variable that is not accounted for by the predictor. This is a relatively high value, which suggests that the predictor (i.e. engagement of the LEs in musical instrument) is a good predictor of the dependent variable (i.e. extent of enhancement on the motor skills of the LEs).

On the other hand, the F-ratio of 83.604 indicates that the regression model is significant, which means that there is a significant effect of the predictor (i.e. engagement of the LEs in musical instrument) on the dependent variable (i.e. extent of enhancement on the motor skills of the LEs). The p-value of 0.0000 is very low and indicates that the effect of the predictor variable on the dependent variable is statistically significant.

Previous studies had consistently shown that musical engagement can significantly enhance the motor skills of learners with exceptionalities. This is particularly true for individuals with Autism Spectrum Disorder (ASD) who often struggle with motor coordination and fine motor skills. Studies have found that regular musical engagement, such as playing an instrument or participating in a music therapy program, can lead to improvements in hand-eye coordination, finger dexterity, and overall motor planning abilities (Ekins et al., 2019).

One reason why music has such a positive impact on motor skills is due to the rhythmic nature of music. Studies have shown that exposure to rhythm can improve motor planning abilities and enhance motor synchronization. This is particularly beneficial for learners with exceptionalities who struggle with movement coordination. Through musical engagement, individuals can improve their ability to time and coordinate movements, which can have a positive impact on daily life activities, such as dressing or eating (Shukla et al., 2022).

Empirical works that were previously done had also shown that musical engagement can improve emotional regulation in learners with exceptionalities. Emotional regulation is an essential skill that allows individuals to manage their emotions in a healthy and effective manner. Individuals with ASD often struggle with emotional regulation, and music can be an effective tool to help regulate emotions. Studies have found that music therapy sessions can improve emotional regulation, reduce anxiety, and increase overall well-being in learners with exceptionalities (Rose et al., 2019).

Additionally, musical engagement can also have a positive impact on social skills development in learners with exceptionalities. Studies have found that musical activities, such as group singing or playing instruments in an ensemble, can improve social communication and interaction. For individuals with ASD, who often struggle with social communication, music can

provide a safe and enjoyable way to interact with others. Through musical engagement, learners can develop social skills, such as turn-taking, listening, and following directions, which can be transferred to other areas of their life (Rose et al., 2019).

**TABLE 8**
**Test of Significance on the Difference between the evaluations made by the SpEd Teachers and Parents or Guardians as to the Level of Engagement in Musical Instrument and the Extent of Enhancement in the Motor Skills of the Les**

| Evaluations between SpEd Teachers and Parents | x | df | Comp. t -value | *p*-value | Results | Decision |
|---|---|---|---|---|---|---|
| Level of Engagement in Musical Instrument | $x_t = 3.0$<br>$x_p = 2.9$ | 9<br>9 | 1.1053 | 0.141793 | The result is not significant | Accept Ho |
| Extent of Enhancement in the Motor Skills of the LEs | $x_t = 2.4$<br>$x_p = 1.8$ | 11<br>11 | 5.21295 | 0.000016 | The result is highly significant | Reject Ho |

The data in Table 8 shows the results of a t-test conducted to determine if there is a significant difference between the evaluations made by Special Education (SpEd) teachers and parents/guardians in terms of the level of engagement in musical instruments and the extent of enhancement in the motor skills of learners with exceptionalities (LEs). The null hypothesis (Ho) states that there is no significant difference between the two groups' evaluations, while the alternative hypothesis (Ha) suggests that there is a significant difference.

For the level of engagement in musical instruments, the SpEd teachers' mean evaluation was 3.0, while that of parents/guardians was 2.9. The computed t-value was 1.1053, with a corresponding p-value of 0.141793. Since the p-value is greater than the alpha level of 0.05, the result is not statistically significant, and the null hypothesis is accepted. Therefore, it can be concluded that there is no significant difference between SpEd teachers' and parents/guardians' evaluations of the level of engagement in musical instruments.

On the other hand, for the extent of enhancement in the motor skills of LEs, the SpEd teachers' mean evaluation was 2.4, while that of parents/guardians was 1.8. The computed t-value was 5.21295, with a corresponding p-value of 0.000016. Since the p-value is less than the alpha level of 0.05, the result is statistically significant, and the null hypothesis is rejected. Therefore, it can be concluded that there is a significant difference between SpEd teachers' and parents/guardians' evaluations of the extent of enhancement in the motor skills of LEs. The results of this study suggest that SpEd teachers and parents/guardians may have different perceptions of the extent of enhancement in the motor skills of LEs. Further investigation may be needed to determine the reasons for this difference in perception and how it can be addressed to ensure that the needs of the learners are met effectively. Particularly during the Covid-19 pandemic, where physical meet is restrained, the actual involvement of the young learners with exceptionalities in musical instrument training is stalled. In fact, both parents and teachers viewed differently the situation for reasons that are distinct from one to the other. It can be gleaned here that the viewpoints of both groups could indeed differ. Hence, learning the musical instrument at home may be viewed differently by parents from having it done in school (Bubb & Jones, 2020). Hence, this case asserts the necessity to derive the possible disparity of evaluation between the two groups on such matter.

Such data analysis of Table 8 indicates that there is no significant difference between SpEd teachers' and parents/guardians' evaluations of the level of engagement in musical instruments, while there is a significant difference in their evaluations of the extent of enhancement in the motor skills of LEs. These findings have important implications for the education and support of LEs, and further research may be needed to explore these differences further.

Statistically, this type of test helps determine whether the difference in evaluations made by SpEd teachers and parents or guardians is significant or not. If the difference is not significant, it implies that both groups share similar perceptions about the engagement level and motor skill enhancement of LEs. On the other hand, if the difference is significant, it suggests that one group's evaluation is significantly different from the other group's evaluation, indicating the need for further investigation. Also, this test identifies the source of the difference between the evaluations made by SpEd teachers and parents or guardians. It could be due to the different perspectives, experiences, or expectations of the two groups. However, the full support and resiliency of the parents to the educational undertaking of their respective kids with special needs is a factor to reckon (Karaman et al., 2019).

Somehow, such test can assist in pointing out the factors that contribute to the difference and provide insights into how to bridge the gap between the evaluations of the two groups. In particular, t-test offers the avenue to have better decision-making about the interventions to be done when the evaluation of both respondent-groups raised the same concern as to how the musical engagement of the LEs affect their motor skills enhancement. Hence, the employment of t-test in

inferring the possible disparity of evaluation made by the SpEd Teachers and parents/guardians of the LEs is appropriate under the recent study.

After presenting, analyzing, and interpreting the scientific results, it is believed that the readers of this manuscript have at least grasped the most vital information regarding the higher probability of LEs improving their motor skills by engaging in musical instruments. This section also highlights the perspective of both SpEd teachers and parents/guardians on the involvement of LEs in such musical instruments. Both respondent groups have observed enhancements in the motor skills of LEs, which is further supported by the data presented in this study.

## IV. Conclusion

After reviewing the study's findings, it is evident that musical instrument engagement has a significant impact on enhancing the motor skills of learners with exceptionalities.

## V. Recommendations

There are still other scopes, matters, or concerns that the recent study did not fully address due to some reasons. Hence, the following proposals are recommended:

- SpEd teachers are enjoined to use the Sustainable Musical Instrument Training Plan with support from all concerned stakeholders; and
- Future researchers should investigate the confounding variables that either hinder or facilitate the development or enhancement of motor skills among learners with exceptionalities.

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## REFERENCES

[1] Alegrado, A., & Winsler, A. (2020). Predictors of taking elective music courses in middle school among low-SES, ethnically diverse students in Miami. *Journal of Research in Music Education*, *68*(1), 5-30.
[2] Ansdell, G., & Pavlicevic, M. (2016). Musical Guided Movement: A Review of the Literature. Arts in Psychotherapy, 47, 34–42.
[3] Benda, R. N., Marinho, N. F., Duarte, M. G., Ribeiro-Silva, P. C., Ortigas, P. R., Machado, C. F., & Gomes, T. V. (2021). A brief review on motor development: fundamental motor skills as a basis for motor skill learning. *Brazilian Journal of Motor Behavior*, *15*(5), 342-355.
[4] Bhatara, A., et al. (2013). Music therapy improves communication skills in adults with Williams syndrome: a randomized controlled trial. American Journal of Medical Genetics Part A 161A, 2486–2492.
[5] Bishop, J. C., & Pangelinan, M. (2018). Motor skills intervention research of children with disabilities. Research in developmental disabilities, 74, 14-30
[6] Bradt, J., & Dileo, C. (2015). The use of piano in music therapy for children with special needs. Journal of Music Therapy, 52(4), 347–360. https://doi.org/10.1093/jmt/thv011
[7] Bradt, J., Dileo, C., & Grocke, D. (2016). The use of guitar in music therapy for children with special needs. Journal of Music Therapy, 53(3), 223–236. https://doi.org/10.1093/jmt/thv056
[8] Bubb, S., & Jones, M. A. (2020). Learning from the COVID-19 home-schooling experience: Listening to pupils, parents/carers and teachers. *Improving schools*, *23*(3), 209-222.
[9] Burland, K. (2020). Music for all: Identifying, challenging and overcoming barriers. *Music & Science*, *3*, 2059204320946950.
[10] Cibrian, F. L., Madrigal, M., Avelais, M., & Tentori, M. (2020). Supporting coordination of children with ASD using neurological music therapy: A pilot randomized control trial comparing an elastic touch-display with tambourines. *Research in Developmental Disabilities*, *106*, 103741.

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The author is born on December 21, 1974 at Ormoc City, Leyte, Philippines. She finished with flying colours her Bachelor's Degree in Elementary Education at Saint Peter's College of Ormoc. In her high school and college days, she had always been passionate about education and the power it holds to shape and transform lives. From a young age, she had been drawn to the role of a teacher, inspired by her parents who were educators too and who have made a profound impact on her life. The author also has this big desire to make a difference in the lives of students who face extra learning challenges .This leads her in finishing her Master of Arts in Education Major is Special Education at Cebu Technological University Main Campus.

She was previously teaching at the Department of Education for 18 years and widened her horizon as a Culture Exchange teacher in North Carolina, USA for 4 years. She believes that a teacher serves as inspiration, motivator, encourager and educator to the learners whatever their individual needs and capabilities are.