

The Effect of Music on the Acquisition of Mathematical Skills in Early Childhood Education in the Buea Municipality of Cameroon

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ABSTRACT

This study set out to investigate the effect of music on the acquisition of mathematical skills in early childhood education in Buea Municipality. A sample of 30 pupils and 30 teachers were sampled through the purposive sampling technique. Four instruments were used to collect data; a structured questionnaire designed using the Likert scale and an interview guide for teachers while a working memory test and participant's observation was used to collect data from the pupils. Data was analyzed using descriptive and inferential statistics. Descriptive statistics in the form of percentages, charts and frequencies were used to present demographic information and to answer the research questions, while inferential statistics with the aid of independent one-way ANOVA was used as a statistical tool to test the hypothesis at 0.05 level of significance. The findings revealed that there is a significant relationship between music and the acquisition of mathematical skills in early childhood education. Implications and recommendations were made to teachers, parents and the government as well as suggestions for further studies was made based on these findings.

Keywords: Childhood Education, Mathematical Skills, Music, Working Memory Test

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I. INTRODUCTION

The place of music in education cannot be over-emphasized. Historically, Greek myth and legends tell of the wondrous effect of music. The first Greek philosophers to consider music as important in education and society were Plato and Aristotle. They examined the ends of music, recognizing it and placing most of their discussion on music in their political works. Also, music has a relationship to the common good, particularly its place in education. For Plato (2001), the development of a person's natural capacity lies in the type of education given to that person. He presents music as an indispensable educational value ranging from nursery education right to the education of the philosopher king. Plato's value to music lies in its ability to develop moral character. Aristotle corroborates this importance of music in education but he outlines a tripartite role of music in education. These include; the development of a moral spirit, purgation of emotions and lastly, for relaxation and leisure.

Today, nursery school children learn through music which includes practical activities like singing, dancing and listening. Music requires actions, dance, jumps and gesticulations following the rhythm or instruments of music. The incorporation of music to nursery school children at the appropriate time prepares them for school readiness (Bongwong, 2014). From Gardener's multiple intelligence

theory, the use of music as a teaching aid permits many children to be able to participate in classroom activities according to their interest/aptitude. Music produces a kind of pleasure which human nature cannot do without. It helps children to make connection between what they experience at home and what they are taught in school, thus bridging the gap between home and school (Dewey, 1966).

A. Music and Mathematical Skills

Music is organized in mathematical ways; its melodies, rhythms and harmonies are built on recurring mathematical patterns and sequences. To children, music is play in every sense of the word. Early experiences with music that are successful and fun prepare children to be successful in other areas of learning particularly math. Music directly and consistently enhances mathematical thinking; particularly abstract reasoning skills, in young children. Jensen (1995) believes that the brain is specifically wired to receive process and learn from the highly ordered patterns of sound in music.

Weikart (2004) said that steady beat activities are an important way for children's thinking and their physical abilities. In the same light he said that steady beat experiences involve movement that is performed in a steady way to a rhyme chart or feel the steady beat under the rhythm of the words or melody.

Music movement experiences that strengthen the acquisition of cognitive mathematical skills in early

childhood education include; numbers, classification, seriation, time and memory skills.

Classification: As children sort materials into groups and collections, they are using classification, the process of grouping things by similarities and differences. Children also work with classification in music experiences.

Number: According to Epstein (2003), the concept of number develop as children classify objects, they count the object to know how many objects are in each group, there by building math related thinking as they notice respond to similarities and differences in the context of music. Epstein (2003) also believes that children's understanding of number is awareness of one-to-one correspondence. This concept is developed when children march one-to-one for example. In beat activities children experience the rhythms of the words or songs while patting, tapping or walking to the steady beat, thus matching their pats or steps one-to-one with the beat children become accurate with steady beat after many such experiences.

Also, another way to help children form a cognitive motor link for the concept of one-to-one correspondence is to use what Weikart call "Learner say and Do". In this process, a child chants a word and simultaneously performs a related movement. For example, a child who is marching says the word "march" every time each foot touches the floor. Say and do means that children say the words that define their actions (say) and then match the movement to the words (do).

Seriation: This is the ability to arrange things in series or pattern. According to Epstein (2003), when children arrange patterns of music and then represent the pattern or sequence with movement help to enhance children's seriation abilities. Arranging pattern can be done as a whole body.

Weikart (2003) believes that children can use parts of their body like shoulder, knees for example they can part in silent steady beat using both hands at the same time repeating the word shoulders eight time (each section is 16 beats) and then the second movement (for example head) eight times, the process is repeated.

Time: As well as engaging children in noticing and creating pattern, activities in which children work with sequence of movement are also opportunities for children to anticipate remember and describe sequence of events. Such experiences contribute to children's developing understanding of time and strengthen reasoning skills used in math (Epstein, 2003). Actions songs engage children in working with sequence for example, look at the road a car is coming and the children are asked to recall how many times they repeated the first line. Starting and stopping is another important experience that helps the young child understand time and that can be used to develop the music math connection (Epstein, 2003). The children starts walking to the beat of a song that you are about to sing such as put your right hand up.

Memory skills: Memorization is a general cognitive skill that comes to play in math, and that can be enhanced through music and movement activities singing songs builds children's memory of their melodies and lyrics. Since music is a tool of memorization, everyone has learned 1-10, ABCs by singing them. According to Jancke (2008) listening and singing music engages many highly complex brain functions

that are necessary for memory, word sequence and visualization. Music often has a rhythmic or rhyme, quality making it easier to remember. It is sequence which encourages us to try to recall songs we like, thus engaging memory goes to help children's spatial temporal reasoning and proportional math skills. Songs like '30 days had September' 'South West Region, Division and head quarter' are still sung today because of memorization.

Music helps memory. According to Singer (2008) music increases the chance children have to learn, with music having been a strategy to assist in the recall of information.

To conclude, working with children in the early childhood classroom builds the foundation for the rest of their lives.

B. Music and the Acquisition of Mathematical Skills in Early Childhood Education

A study was carried out by Bamberger and Disessa (2003), to investigate the effect of music on pupils' academic performance in nursery and primary schools of Tubah Municipality. In order to achieve this objective, a quasi-experimental research design was used with both quantitative and qualitative research methods. From the total population of 3,070 pupils and 300 teachers in 45 schools, 120 pupils, 40 teachers and 04 schools were sampled using the non-probability sampling technique that is the convenient. The purposive sampling technique was used in deciding which part of the accessible population constitutes the sample population which in this case was made up of nursery school children, primary two pupils and teachers.

The Krejcie and Morgan table was used to decide how many teachers and pupils make up the sample. Four instruments were used to collect data; a structured questionnaire designed using the likert scale, an interview guide for teachers, working memory test and participant's observation guide. Descriptive statistics (in the form of frequencies, percentages, charts and tables) and inferential statistics were used for data analyses. Specifically, the two-way ANOVA and Regression analysis tests were used to test the hypothesis at a 0.05 level of significance. The finding revealed that there is a significant relationship between the use of music in the teaching and the pupils' academic performance in Mathematics. That is, when music is used the pupils perform better in Mathematics. Based on these findings, it was recommended that more attention be given to ensure the employment of music pedagogy within the competence/project based approaches.

Gardner *et al.* (1996) researching in the impact of an arts program also found that participating children performed better in mathematics than those who did not.

A connection between music and math was also found during a neurological research study it was documented that "higher brain functions of abstract reasoning as well as spatial and temporal conceptualization are enhanced by music activities. Activities with music can generate the neural connections necessary for using important math skill (Church, 2000).

The connection between music and cognitive benefits, especially in math skills, was generally traced to the ancient Greek, Pythagoras, who in the fifth century B.C suggested

that mathematical relationships were integral to physical properties, including those in music. Music when approached through making and responding to coherent musical structures, facilitated by multiple, intuitively accessible representations-can become a learning context in which basic mathematical ideas can be elicited and perceived as relevant and important (Bamberger & Disessa, 2003).

C. Objective of the Study

Specifically, this study is aimed at determining the extent to which singing, dancing and playing of musical instruments influences the acquisition of mathematical skills in early childhood education.

D. Research Question

Does singing, dancing and playing of musical instruments influence the acquisition of mathematical skills?

E. Research Hypothesis

This study would be guided by the following research hypotheses:

Ha₁: Singing, dancing and playing of musical instrument has a significant effect on the acquisition of mathematical skills in early childhood education.

Ho₁: Singing, dancing and playing of musical instruments has no significant effect on the acquisition of mathematical skills in early childhood education.

II. METHOD

An experimental research design was chosen for this study. The category adopted for this study is the true experimental design (non-equivalent control group pretest/post) by which two blocks of children are envisaged in the experiment; the experimental block and the control block.

Given the nature of this study, the triangulation method was also adopted where the researcher used both quantitative and qualitative research methods in collecting data. A working memory tests was used to collect quantitative data on some mathematical skills like sorting, classifying, seriation and numbers while a structured interview guides was used for qualitative data on mathematical skills acquired from music.

The accessible population comprised of both pupils and teachers in the government practicing school Ndongo (Molyko), Saint Sylvester Bilingual Nursery and Primary School Muea in Buea municipality. The researcher adopted the purposive sampling method for the selection of thirty (30) pupils (6-8 years old) and 30 teachers. It was distributed as such:

TABLE I: SAMPLE DISTRIBUTION OF THE STUDY

TABLE 1. SAMPLE DISTRIBUTION OF THE STUDY			
Experimental group		Control group	
Government Practicing School (GPS) Ndongo Molyko		Saint Sylvester (SASYBS)	
Pupils	Teachers	Pupils	Teachers
15	15	15	15
30		30	
60			

The instruments used for this study were participant observation, interview guide, questionnaire and working memory test. The interview guide was made up of 15 items while the questionnaire was made up of closed ended items with likert scale responses to choose from. These two instruments were for the teachers of junior primary. The participant observation and working memory test was used for the children. The working memory test was made up of 11 questions derived from the sub variables to compare working memory processes for both children at the experimental and control group. The participant observation was used inside and outside the classrooms at the 2 schools where the study was conducted. It had 12 questions derived from the sub variables. This included both inside and outside school activities that involved musical activities especially those that related to playing songs, rhymes, storytelling and other activities.

The self-delivery method was used in the data collection procedure. The quantitative data was analyzed with descriptive and inferential statistics while data analysis for the interviews included a well demarcated phase labeled thematic-content analysis and pre-coding.

III. RESULTS

For the demographic information of the respondents, 3(20.0%) teachers were sampled from each of the classes, nursery one, nursery two, class one, class two and class three giving a total of 15(100%) teachers. Furthermore, 3 teachers had taught between 0-5 years (20.0%); 6(40.0%) teachers had worked for 6-9 years; 3(20.0%) teachers had worked for 10-13 years and finally, 3(20.0%) teachers had working experience for 14 years and above. Concerning their qualifications, 9(60.0%) teachers had CAPIEMP and O level as highest certificate while 6 (40.0%) teachers had CAPIEMP and A level as highest certificate. For the working memory test, 3(20.0%) pupils were each selected from the following classes, nursery one, nursery two, class one class two and class three giving a total of 15 pupils. 8(53.3%) of the pupils sampled were males while 7 of them were females (46.7%). 5(33.3%)pupils were within the age range of 3-6 years, also 5(33.3%)respondents were 7years and those who were 8years old were equally 5(33.3%) of them.

F. Presentation of Findings based on the Research Question

a. Experimental and control groups based on interview guide for teachers

The table below brings to light the fact that those pupils who were taught mathematical skills without the use of music (singing, dancing and playing of musical instruments) referred to as the control group had a percentage of 56.0%, based on an interview which was conducted with the teachers. Also, the same pupils received treatment by being taught with the use of music (singing, dancing and playing of musical instruments), interestingly an increase was witnessed giving a percentage of 80.0%. This is an indication of the fact that mathematical skills are enhanced

when taught using music (singing, dancing and playing of musical instruments).

TABLE II: DATA ON EXPERIMENTAL AND CONTROL GROUPS BASED ON MATHEMATICAL SKILLS

Items	Experimental Group		Control Group	
	Frequency	Percent	Frequency	Percent
1	15	100%	10	66.7%
2	10	66.7%	8	53.3%
3	9	60.0%	6	40.0%
4	14	93.3%	10	66.7%
5	12	80.0%	8	53.3%
Total	60	80.0%	42	56.0%

b. Experimental and control groups based on questionnaire for teachers

Supporting evidence for this study was based on data collected from questionnaire. It brought to light the fact that 70(77.8%) of the teachers' responses were positively oriented to the fact that when pupils are taught mathematical skills without making use of musical instruments, singing and dancing (control group) their acquisition is less enhanced. 20(22.2%) responses from the teachers were negatively oriented towards the fact that teaching mathematical skills without making use of musical instruments, singing and dancing (control group) enhance pupils' acquisition.

Moreover, it was noticed that 80(88.9%) responses from teachers affirmed the fact that when pupils are taught mathematical skills using musical instruments, singing and dancing (experimental group) their acquisition is enhanced, indicating an increment in acquisition of mathematical skills from the positive responses in the control group. However, few of the teachers' responses 10(11.1%) negatively asserted that teaching mathematical skills using singing and

TABLE III: DATA ON EXPERIMENTAL AND CONTROL GROUPS BASED ON MATHEMATICAL SKILLS

Items	Experimental Group				Control Group			
	Positive Option	%	Negative Option	%	Positive Option	%	Negative Option	%
1	13	86.7%	2	13.3%	12	80.0%	3	20.0%
2	13	86.7%	2	13.3%	11	73.3%	4	26.7%
3	12	80.0%	3	20.0%	13	86.7%	2	13.3%
4	15	100%	0	0.0%	15	100%	0	0.0%
5	13	86.7%	2	13.3%	10	66.7%	5	33.3%
6	14	93.3%	1	6.7%	9	60.0%	6	40.0%
Total	80	88.9%	10	11.1%	70	77.8%	20	22.2%

dancing enhance pupils acquisition.

c. Working memory test for pupils

A working memory test was given to pupils in both the control and the experimental groups in the study to find out the level of acquisition of mathematical skills when taught using different musical activities.

TABLE IV: IDENTIFICATION OF SCALE LABELS AS USED IN THE WORKING MEMORY TEST

Full name	Abbreviation	Rating
Could do better	CDB	1
Fair	F	2
Fairly good	FG	3
Good	G	4
Very good	VG	5
Excellent	EX.T	6

$$\text{Decision rule} = \frac{\text{sum of scale rating}}{\text{maximum number in the scale}}$$

$$\text{Scale value for the decision rule} = \frac{6+5+4+3+2+1}{6}$$

$$\text{Scale value for the decision rule} = 3.50$$

Data collected from a memory test given to pupils revealed from the control group that 10 pupils' scores had a scale value of 1.67 which is below the average scale value for the decision rule (3.5) indicating that the performance was below average therefore they were evaluated as; could do better. 7 pupils' scores had a scale value of 1.17 which is below the average scale value 3.5 of the decision rule. Furthermore, 11 scores were rated at 1.83 as such they were evaluated as fairly-good since it was above the average scale value of the decision rule.

TABLE V: WORKING MEMORY TEST FOR PUPILS ON MATHEMATICS SKILLS

Items	Experimental Group							
	CDB	F	FG	Total	G	VG	EX.T	Total
1	0	0	0	0(0.0%)	0	0	15	15(100%)
2	0	0	0	0(0.0%)	2	4	9	15(100%)
3	0	0	0	0(0.0%)	2	1	12	15(100%)
4	0	0	0	0(0.0%)	3	2	10	15(100%)
5	0	0	0	0(0.0%)	4	3	8	15(100%)
Total	0	0	0	0.0%	11	10	54	100%

Items	Control Group							
	CDB	F	FG	Total	G	VG	EX.T	Total
1	0	0	0		0	10	5	15(100%)
2	0	0	8	8(53.3%)	0	7	0	7(46.7%)
3	0	0	0	0(0.0%)	7	8	0	15(100%)
4	0	5	0	5(33.3%)	5	3	2	10(66.7%)
5	10	2	3	15(100%)	0	0	0	0(0.0%)
Total	10	7	11	37.3%	12	28	7	62.7%

Therefore, 37.3% of the pupils' scores were below the average scale value for the decision rule. 62.7% of the pupils score were above the scale value of the decision rule which is an indication of the fact that the use of musical instruments, singing and dancing enhances mathematical skills.

For the experimental group, the pupils scored 100% on the working memory test asserting that all their scores were above the average of the scale value for the decision rule. Therefore, pupils comprehend mathematical skills better when taught using musical instruments, singing and dancing.

B. Presentation of Findings based on Research Hypothesis

The research hypothesis was tested at the 0.05 level of significance using analysis of variance (ANOVA) as inferential statistical test.

a. Verification of Hypothesis

H_{a1} : Singing, dancing and playing of musical instruments have a significant effect on the acquisition of mathematical skills in early childhood education

H_{o1} : Singing, dancing and playing of musical instruments have no significant effect on the acquisition of mathematical skills in early childhood education.

TABLE VI: DESCRIPTIVE STATISTICS FOR MATHEMATICAL SKILLS

Condition	Mean	Std. Deviation	N
Control group	9.1667	1.47196	15
Experimental group	13.3333	1.63299	15
total	11.2500	2.63283	30

The table above reveals that the mean value for those who were taught without the use of music (control group) is 9.17 and a standard deviation value of 1.47. Also, the mean value for those who received treatment that is taught with the use of music (experimental group) was 13.33 and a standard deviation value of 1.63. This brings to light the fact that the mean value for the experimental group is higher than that for the control group.

The Levene's test of equality of error variance (Table VII) tests the null hypothesis that the error variance of the variable is equal across groups. The Levene's test of homogeneity of variance on the control and experimental groups reveals that the statistic is not significant. The p values stood at 0.70, which is an indicator of non-significance since the value is greater than 0.05. Hence homogeneity of variance across groups therefore assumption of the test is not violated.

The independent one way ANOVA revealed that music had a significant effect on the acquisition of cognitive skills in early childhood education ($F=21.55$, $df=1$, $p=0.001$). There is a significant difference ($p=0.001$) between the means of those who were taught mathematics skills without the use of music referred to as the control condition ($M=9.17$, $SD=1.47$) and those who were taught mathematics skills with the use of music referred to as the experimental group ($M=13.33$, $SD=1.63$) with pupils in the experimental group scoring higher on the working memory test than those in the control group. It should be noted that the post hoc test for this data was not computed because the number of conditions were less than three; therefore it suffices to test the between-subject effects significance of the two groups.

Based on the extremely high significance (0.001) of this hypothesis which is below 0.05 and 0.01, the null hypothesis is rejected while the alternative hypothesis is retained leading to the conclusion that Singing dancing and playing of musical instruments have a significant effect on the acquisition of mathematical skills in early childhood education. The partial Eta Square value is 0.68 which according to Cohen (1988) is a large effect. Since the partial Eta square is an index of the effect size. It indicates that,

about 68% of the variance in the acquisition of mathematical skills in early childhood education can be predicted from teaching these skills using musical techniques (playing of musical instruments, singing and dancing).

TABLE VII: SHOWING LEVENE'S TEST OF EQUALITY OF ERROR VARIANCES

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power
Corrected Model	52.083 ^a	1	52.083	21.552	0.001	0.683	21.552	0.986
Intercept	1518.750	1	1518.750	628.448	0.000	0.984	628.448	1.000
Condition	52.083	1	52.083	21.552	0.001	0.683	21.552	0.986
Error	24.167	10	2.417					
Total	1595.000	12						
Corrected Total	76.250	11						

a. R Squared = 0.683 (Adjusted R Squared = 0.651)

b. Computed using alpha = 0.05

TABLE VIII: SHOWING TEST OF BETWEEN-SUBJECTS EFFECTS

F	df1	df2	Sig.
0.156	1	10	0.701

a. Design: Intercept + Condition

IV. DISCUSSION OF FINDINGS

The findings of this study revealed that if music is induced in early childhood education, the pupils acquire mathematical skills faster. It was brought about by the fact that majority of the teachers responses were positively oriented towards the view that musical activities like singing, dancing and playing of musical instruments enhanced the acquisition of mathematical skill in early childhood education with a percentage of 80.0 of the Experimental Group (EG) while the Control Group (CG) was 56.0%. Therefore it was crystal clear from the descriptive analysis and the interview conducted with the teachers, that mathematical skills are enhanced when taught using music.

From the research hypothesis, the mean value for those who received treatment that is taught with the use of music (EG) was 13.33 and a standard deviation value of 1.63. That is mean value for the experimental group is higher than that for the control group.

Based on the extremely high significance (0.001) of this hypothesis which is below 0.05 and 0.01, the null hypothesis is rejected while the alternative hypothesis is retained leading to the conclusion that singing, dancing and playing of musical instruments have significant effects on the acquisition of mathematical skills in early childhood education.

The test of between-subject effects brings to light the fact that, the independent one way ANOVA showed that music has significant effects on the acquisition of cognitive skills in early childhood education.

More so, 88.9% of the teachers' responses from the questionnaire were positively oriented to the fact that when pupils are taught mathematical skills using singing, dancing their acquisition is enhanced (EG), indicating an increment in the acquisition of mathematical skills from the positive responses in the control group.

As far as the working memory test is concerned, pupils in the EG (100%) scored higher on the working memory test than those in the control group (62.7%). Based on the extremely high significance of 0.001 of this hypothesis which is below 0.05 and 0.01, the null hypothesis was rejected while the alternative hypothesis retained. Inferences led the researcher to conclude that singing, dancing and the playing of musical instruments have significant effect on the acquisition of mathematical skills in early childhood education.

This view is supported by Gardner, Fox, Knowles & Jeffrey (1996) who asserts that teaching and learning should take place through several modalities and develop a curriculum that caters for a diverse intelligence. He said that since children possess different kinds of minds and therefore learn, remember, perform and understand in different ways, musical intelligence is one type of intelligence that shows sensitivity to rhythm for examples 1, 2, 3, 4, 5...can you catch a fish alive...basic mathematical concepts like numbers and seriation can be acquired through remembering or recall of song.

In the same manner he believes that human beings possess a number of relatively distinct intelligences and that human potentials cannot be tied to one's preference of learning thus human potential lies in the fact that learners have a unique blend of capabilities and skills (Gardner, Fox, Knowles & Jeffrey, 1996).

Sawyers and Hutson Brandhagen (2004) supported this when they said that when items to be memorized are set to music, children remember them more easily.

More so, Epstein (2003) asserts that the concept of numbers develop as children classify objects, they count the object to know how many objects are in each group, thereby building maths related thinking as they noticed respond to similarities and differences in the context of music.

V. RECOMMENDATIONS

With respect to the findings obtained from this study, the following points, if considered and implemented would go a long way to enhance the acquisition of mathematical skills in early childhood education. Recommendations were made to the following:

Teachers: Incorporation of musical activities during the teaching learning process that have numeracy potentials into the main stream education system especially in early childhood education.

Furthermore, the study challenges early childhood educators to know how important music is in the teaching learning process in early childhood education.

Educators will benefit from this study and be able to formulate more strategies that will help enhance children acquisition of mathematical skills.

Teachers should teach music at all levels.

School administration: This study will equally be of interest to music educators and music therapists, particularly in today's sound saturated world.

Also, more time should be allocated to the teaching of music in our nursery and primary school for example instead of 20 minutes; it can be increased to 30 minutes.

Teachers should be provided with resources by the school administration to support and ensure best practices in pre-schools.

School administration should give sensitization programs regarding the kind of music parents should play at home for children to listen.

Government: the study is important to the Cameroon education family as a whole even though it is found in nursery, primary and teacher training college curriculum, it should be introduced to secondary education thus music should be taught at all levels, from basic to higher education.

With reference to the school curriculum, the study found out that the school curriculum lacked the inclusion of most music activities. The inclusion of music activities in the school curriculum would greatly enhance quality delivery of education.

The government should train music teachers and experts at all levels of the educational ladder in order to enhance the teaching of music in our schools.

They should be a music curriculum that has educative songs that are related to the acquisition of skills.

Early childhood education centers need to be provided with an early childhood education curriculum that could provide guidelines for topic selection, choice of activities and materials, determining competences and performance indicators for young children.

There should be the establishment of teacher training centers to train teachers for early childhood education only.

VI. CONCLUSION

This research was to investigate the effects of music on the acquisition of mathematical skills in early childhood in Buea Municipality. The study has found that musical activities have many educational benefits under pinning the development of cognitive skills in early childhood which could be very useful for promoting their intellectual capacity. Incorporating these activities into the school curriculum and allowing children to perform them could greatly promote children's development of numeracy, their mother tongue, linguistic competences, increase school attendance, and promote self-esteem among children at a young age. Localizing the school curriculum through the inclusion of music activities would help inculcate the Cameroonian values of patriotism, social responsibility and help integrate children to function appropriately in their country and communities which they live in. Through this study, it has been demonstrated that music activities are important for children's mathematical skills and social development. Findings from this study therefore have strong implications for justifying the inclusion of music activities in the school curriculum because they function not only to maintain social interaction, connections between school and

community but also in the acquisition of mathematical skills.

In a nutshell, music has a direct link with the cognitive development of a child because listening, seeing, moving and feeling are all important in music education curriculum. Since music is a natural discipline, the child acquires a holistic skill in life.

SUGGESTIONS FOR FURTHER STUDIES

- This project was carried out in nursery and junior primary schools in Buea municipality. Therefore, a similar study can be done at other levels of education in order to have a comparative analysis which would contribute immensely to the body of knowledge in this domain.
 - The influence of music on the development of children (socio-affective and psychomotor domain).
 - The role of indigenous music in the promotion of cognitive development in the Cameroonian children.
- declares that she does not have any conflict of interest.

REFERENCES

- Bamberger, J. & Disessa, A. (2003). Music as Embodied Mathematics: A Study of a Mutually Informing Affinity. *International Journal of Computers for Mathematical Learning*, 8(2): 123-160.
- Bongwong, B. (2014). *Memory Processes in Acquiring Xylophone Playing Competences Among Nso' Children in Kumbo*. [Unpublished doctoral dissertation]. University of Buea.
- Church, E. (2000). Music and Math: The Magical Connection Scholastic Parent and Child. *Early Childhood Education Journal*, 18(3),
- Dewey (1966). *Democracy and Education: An Introduction to the Philosophy of Education*. New York: Free Press.
- Epstein, A.S. (2003). *Early Math: The Next Big Thing*. Ypsilanti, MI: High/Scope Press.
- Gardner, M.E., Fox, A., Knowles, F. & Jeffrey, D. (1996). Learning Improved by Arts Training Natur. *Early Childhood Education Journal*, 381(6580), 284 -295.
- Jancke, L. (2008). Music, Memory and Emotion. *J Biol*, 7(6), 20-21.
- Jensen, E. (1995). *Music with the Brain in Mind*. New York: Worths Publisher.
- Plato (2001). *The Republic*. (tr.). New York: Oxford University Press
- Sawyers, K. & Hutson Brandhagen, J. (2004). Music and Math: How do we make the connection for preschoolers? *Child Care Information Exchange*, 46-49.
- Singer, M. (2008). Accessing the Musical Intelligene in Early Childhood Education. *Australasian Journal of Early Childhood*, 2(33).
- Weikart, P. (2003). Value for Learning and Living: Insights on the Value of Music and Steady Beat, *Child Care Information Exchange*, 86-90.