Current Issues in Education
Mary Lou Fulton Teachers College • Arizona State University
PO Box 37100, Phoenix, AZ 85069, USA

Volume 15, Number 1 January 1, 2012 ISSN 1099-839X

The Effects of Background Music on Learning Disabled Elementary School Students' Performance in Writing

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This study investigated effects of background music on writing performance of nine 6th grade students with learning disabilities at one suburban public elementary school in the mid-Atlantic region of the United States. A single-subject A-B-A design was utilized, and results from graded writing prompts with and without background music over 21 weeks were compared. Group Mean gain was higher in the music (treatment) phase than in the final phase (returning to baseline), indicating that background music improved writing ability of students with learning disabilities overall. Scores dropped instantly and markedly in the first weeks that music was added and removed, indicating that consistency in routine may be more essential to academic performance for students with learning disabilities than the presence or absence of background music.

Keywords: learning, special education, music, learning disabled, writing

This study was based upon research conducted by Kariuki and Honeycutt (1998) which investigated whether or not music could be used as a tool to motivate students with emotional and behavioral disorders to develop positive attitudes toward writing, and whether or not these attitudes would result in improved writing skills. Kariuki and Honeycutt focused upon two 4th grade male students with emotional and behavioral disorders in a rural east Tennessee elementary school. Their results indicated that (a) the quality of basic writing skills improved overall when the students were exposed to music during writing assignments, (b) the students were immediately absorbed in the music and the calming effect helped them to ignore surrounding distractions (thus enabling them to focus on their writing assignments), (c) quantity of writing increased substantially in writing assignments with music while writing assignments without music were regarded as chores to be accomplished as quickly as possible, and (d) the students' attitudes towards writing improved (writing assignments were considered "exciting" when exposed to music during writing).

Understanding the impact of motivational techniques on students with learning disabilities can be of great assistance to practicing teachers. Students with learning disabilities welcome verbal persuasion to boost their confidence levels (Klassen & Lynch, 2007) and depend on external sources of evaluation such as teacher feedback, grades, and marks (Lincoln & Chazan, 1979), although teacher behaviors are not significantly linked to motivational variables for students with learning disabilities (Lapointe, Legault, & Batiste, 2005).

Purpose of the Study

The purpose of this study was to determine whether or not background music had a positive effect on writing performance of students with learning disabilities. If a positive relationship could be determined, the use of

background music may be considered beneficial in educating students with learning disabilities in writing assignments. If there was a negative or no relationship, then either additional research may be necessary, or background music should not be utilized in future writing assignments.

Literature Review

The research located in this literature review included studies that were tangentially related to the subject and spanned from 1979 to the present. This was due to a scarcity of directly related literature found concerning the effects of background music on writing performance of students with learning disabilities. None of the works cited were considered to be seminal works.

Positive Effects of Music on Student Learning

Educators have a problem motivating students to become engaged in the literary process, and music may be one way of fostering this engagement (Ebistuani, Donlan, & Siebers, 1991). Integrated music experiences improve students' reading, writing, thinking, and analyzing skills and strategies by providing excitement in learning (Collett, 1992). It may also be concluded that integrating music into elementary, middle school, high school, advanced placement, and college linguistic classrooms, as well as into virtual classrooms, enables students to learn to read and write more easily, based upon Gardner's multiple intelligence theory, the Mozart Effect, and participation as precedent to learning (DiEdwardo, 2005). According to O'Bruba (1987), the use of music in the teaching of reading at the elementary level may motivate and build the ability of students, whether or not they are musically talented or intellectually above-average. O'Bruba further stated that because of similarities in the symbol structure of music and written language, left-to-right framework, and visual and auditory discrimination, music can be used in beginning reading programs for stimulation and inspiration.

Kariuki and Honeycutt (1998) found that the quality and quantity of spontaneous writing demonstrated by their two students with emotional and behavioral disorders was positively affected by using music as a stimulus. Observation during the duration of the research revealed a difference in the students' outward reactions during their writing assignments. When music was not available, both students were easily distracted from the classroom environment. They were apparently frustrated and indicated this through their verbal responses and physical actions (usually complaining about the writing assignment and exhibiting increased physical movement). In contrast, when the students were exposed to music, their resistance to perform decreased and they were able to ignore outside disturbances and focus on their writing. This enabled the students to produce a higher volume of writing output which resulted in improved writing skills and positive attitudes.

In a similar study by Donohoe and McNeely (1999) of two 4th grade classes in rural Virginia with a majority of low-achieving students, the number of words written by students when not listening to music was found to be significantly fewer than when the students listened to music.

Neutral and Inconclusive Effects of Music on Student Learning

In their review of the literature on the effects of music on reading, oral language, and writing abilities, Ebisutani, Donlan, and Siebers (1991) posited that the theories which justify the use of music in reading and language arts activities were not firmly backed by research, that the research itself was inconclusive, and that it did not suggest that music has the potential for affecting writing fluency. They recalled studies from as far back as 75 years ago: Fendrick found in 1937 that music distracted students' reading; Henderson, Crews, and Barlow discovered in 1945 that only certain kinds of music was distracting; and Freeburne and Fleischer learned in 1952 that music was not significantly distracting to reading performance. Ebisutani, Donlan, and Siebers also reported research from Groff in 1977 who stated that good listening skills gained in school music situations or instruction will not necessarily transfer into a student's successfully reading words.

Examples of Integrating Music into Learning

Schuster and Vincent (1980) described Lozanov's *Suggestive Accelerative Learning and Teaching* (SALT) method with students with learning disabilities, where music was used in the classroom at the beginning and end of class to relax and calm the students. There were significant gains in both reading and mathematics after one year in the program (a mean gain in reading of 2.2 years and a mean gain in mathematics of 1.4 years), and students also had increased positive self-concepts and better feelings toward their education (Schuster & Vincent).

Collett (1992) reported that the *Learning to Read through the Arts* (LTRTA) program was an integrated elementary curriculum designed as a collaborative effort of specialists in performing arts, visual arts, and reading and classroom teachers who designed units with specific developmental aims that reflected the needs of the children. According to Collett, arts instruction, when integrated with a total reading and writing approach, had significant impact on the child's appreciation for the arts, self-esteem, ability, and desire to learn in the LRTA program.

Methodology

Guiding Research Question and Hypothesis

The following question guided the research: What effect will playing background music during specific writing assignments have on writing performance of students with learning disabilities? The hypothesis was that background music would increase student performance in writing fluency (writing speed) and quality of writing in focus, content, organization, style, and conventions.

Design

This study utilized a single-subject A-B-A design. A-B-A designs are characterized by taking repeated baseline measurements, introducing treatment, making a

number of measurements, then removing treatment to return to a second baseline phase. If the behavior is better during the treatment phase than during either baseline phase, the effectiveness of the treatment has been demonstrated (Gay, Mills, & Airasian, 2009).

Participants

This study was conducted at a suburban public elementary school in the mid-Atlantic region of the United States. There were nine 6th grade students (two females and seven males between 11-12 years of age) in one Learning Support class who had specific learning disabilities in reading, writing, or both. The students' deficiencies in reading negatively affected their performance in writing and spelling. Also, if these students were not proficient at a task, they simply did not desire to either work on or complete it. The students were placed into this Learning Support classroom based upon one or more of the following characteristics: specific learning disabilities in reading, mathematics, and/or speech; autism; attention-deficit/hyperactivity disorder (ADHD); oppositional defiance; communications disorder; emotional disturbance; or required occupational therapy.

Instruments, Data Gathering, and Procedures

AIMSweb Correct Writing Sequence probes were administered weekly to assess writing fluency. Reliability and validity studies were provided by Powell-Smith and Shinn (2004), authors of the *AIMSweb Training Workbook*. Reliability was based upon 15 studies that included interscorer agreement, alternate form, parallel forms, test-retest, split-half, and Cronbach's alpha; validity was based upon eight studies that included criterion measures from the Stanford Achievement Test, California Achievement Test, Test of Written Language, and Developmental Sequence Scoring System (Powell-Smith & Shinn). A rubric writing skills evaluation form, which was used to objectively measure various writing skills, established the initial baseline. The rubric was not tested for reliability or validity. Students engaged in writing prompts and received feedback daily for the duration of the study. They worked on writing skills and writing strategies through both small group and one-on-one instruction with the teacher. There was a weekly one paragraph writing homework assignment (a rough draft, graphic organizer, and final copy). Students also had a formal in-class writing assignment, a three-paragraph essay (edited with the teacher and one peer), and a typed final copy. In addition, students practiced their writing daily through an assigned writing prompt administered during the morning homeroom period.

The study lasted 21 weeks, was conducted in spring 2009, and was comprised of three sections. In the first and third sections (six weeks each), the students completed their writing assignments without any intervention. In the second section (seven weeks), background music was provided as students completed their writing assignments. (Note: Baseline data was gathered during the first week.) The background music utilized in the study alternated each week between two Mozart compositions, *Il re pastore* (opera K. 208) and *Symphony No. 16 in C major* (opera K. 128). These compositions were chosen by the classroom teacher because they are from the classical period and up tempo in nature.

Once a week, students completed correct writing sequence probes (*AIMSweb*). A story starter/writing prompt was read to them. Students then had one minute to think, then the prompt was repeated again followed by three minutes to write. The prompt was repeated one final time before they were finished. From this point, students were graded by the teacher (with a number grade) on spelling, capitalization, punctuation, and whether or not the words made sense. Additionally, a special education assistant teacher scored the prompts a second time to ensure that the number grade was the same. (Note: There was 100% consistency in both scores each time.)

Findings

Overall Results

All students improved their writing efficiency throughout the experiment. As a group, students improved by 26.9 words correct per three minute probe from the beginning to the end of the experiment. The highest score attained by a student was 96, the highest increase from baseline by a student was 41, and the highest overall increase (range) of a student was 44. Four students had their highest score in the final phase of the experiment (return to baseline), four students had their highest score in the music (treatment) phase of the experiment, and one student tied for highest score in both the final phase (return to baseline) and the music (treatment) phase of the experiment. Low score, high score, range, increase from baseline data (calculated as the mean for the entire phase and not as the highest score), and the phase where the highest score was attained for each student is found in Table 2.

In both cases where there was a change in environment – adding the music and removing the music – scores dropped immediately and markedly in the week of the change. When music was added in the treatment phase, the mean score dropped from 54.1 to 50.6 (difference of -3.6). When music was removed in the return to baseline, the mean score dropped from 71.9 to 61.7 (difference of -10.2). These findings are graphically illustrated in Figure 1. Data at critical weekly points in baseline, treatment, and return to baseline by student is located in Table 3.

Measurements of progress (or regression) in each phase by student is found in Table 4. The overall Group Mean gain was higher in the music (treatment) phase (9.8) than in the final phase (returning to baseline) (6.0).

A one-way Analysis of Variance (ANOVA) was used to determine whether or not the differences in student means at the baseline, treatment, and return to baseline phases were significant. Scores differed significantly across the three phases, $F(2, 24) = 57.2$, $p = .001$. (F score significant). Tukey's HSD Post Hoc Analysis (*Psychology World*, n.d.) was then used to determine which specific

Table 1

Student Diagnoses

Student 1	moderate learning disabilities in reading, mathematics, and speech
Student 2	autism and ADHD
Student 3	learning disabilities in reading, writing, and mathematics; autism; ADHD; oppositional defiance; required occupational therapy
Student 4	moderate learning disabilities in reading, writing, and speech
Student 5	moderate learning disabilities in reading
Student 6	communications disorder
Student 7	moderate learning disabilities in reading and speech
Student 8	moderate learning disabilities in reading, writing, and speech
Student 9	moderate learning disabilities in reading, writing, and speech

Table 2

Low Score, High Score, Range, Increase from Baseline, and Highest Score Phase Data by Student

	Lowest Score	Highest Score	Range	Increase from Baseline	High Score Phase
Student 1	42	84	42	35	B
Student 2	38	82	44	41	B
Student 3	23	66	43	31	B & Return A
Student 4	45	82	37	20	B
Student 5	38	70	32	21	Return A
Student 6	29	50	21	17	Return A
Student 7	34	72	38	28	Return A
Student 8	36	73	37	25	Return A
Student 9	57	96	39	24	B
Group Mean	38.0	75.0	37.0	26.9	n/a

Table 3

Points in Baseline, Treatment, and Return to Baseline by Student

	Final Baseline Week	Initial Treatment Week	Drop/ Gain	Final Treatment Week	Initial Baseline Return Week	Drop/Gain
Student 1	59	61	2	84	68	-16
Student 2	55	56	1	81	73	-8
Student 3	54	23	-31	60	53	-7
Student 4	64	59	-5	74	72	-2
Student 5	54	54	0	64	63	-1
Student 6	41	39	-2	50	45	-5
Student 7	46	46	0	65	55	-10
Student 8	47	41	-6	73	60	-13
Student 9	64	76	9	96	66	-30
Group Mean	54.1	50.6	-3.6	71.9	61.7	-10.2

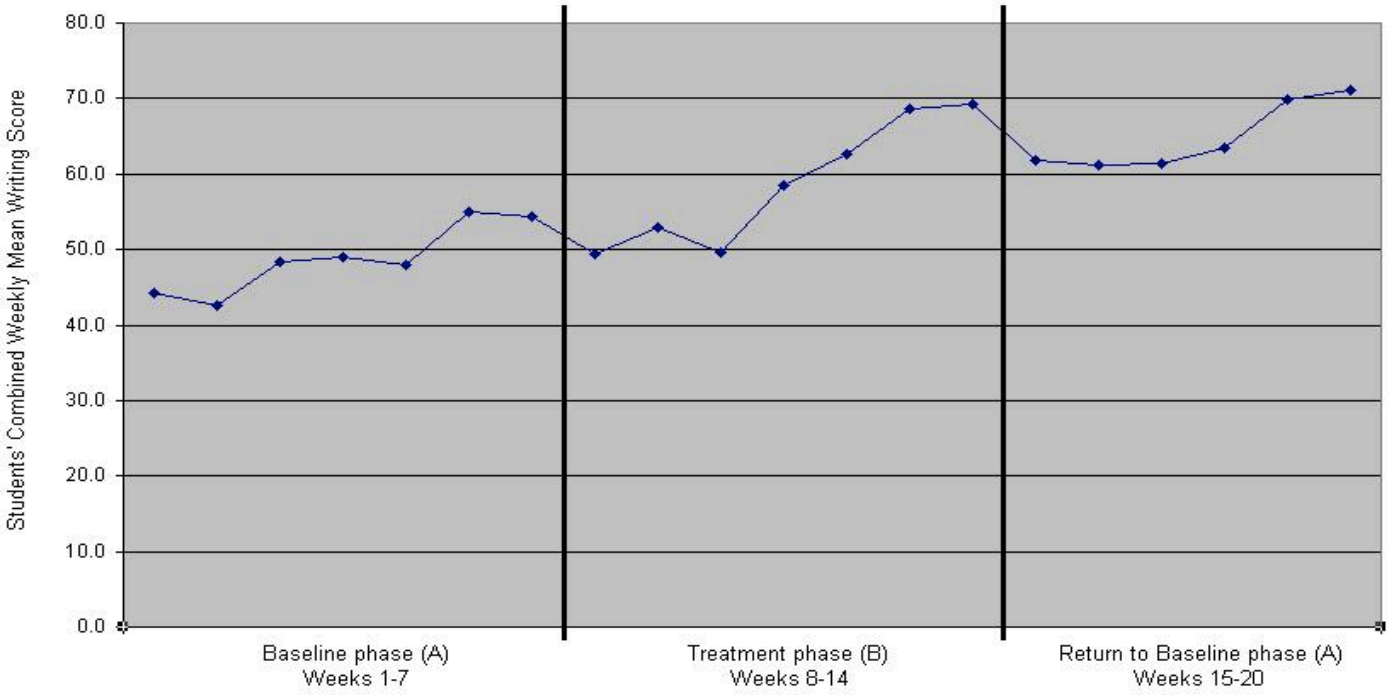

Figure 1. Students' Combined Weekly Mean Writing Score at Baseline, Treatment, and Return to Baseline Phases (A-B-A)

Table 4

Measurements of Progress/Regression in Each Phase by Student

	Baseline A		Treatment B		Return to Baseline A		Difference in Baseline A		Difference in A-B	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Student 1	55.7	6.3	67.9	13.5	73.8	5.6	12.2	7.2	5.9	-7.9
Student 2	46.8	7.1	64.0	12.2	76.3	4.1	17.2	5.1	12.3	-8.1
Student 3	46.1	8.3	50.3	15.7	60.5	4.9	4.2	7.4	10.2	-10.8
Student 4	58.4	7.7	68.7	8.7	72.5	3.2	10.3	1.0	3.8	-5.5
Student 5	47.3	5.2	56.4	6.4	60.3	6.7	9.1	1.2	3.9	0.3
Student 6	34.4	3.0	40.0	5.3	44.7	4.5	5.6	2.3	4.7	-0.8
Student 7	42.6	4.2	49.9	7.7	58.3	6.4	7.3	3.5	8.4	-1.3
Student 8	44.3	7.8	50.1	8.4	59.3	8.4	5.8	0.6	9.2	0.0
Student 9	61.4	3.0	77.9	11.3	73.5	12.6	16.5	8.3	-4.4	1.3
Group Mean	48.6	5.8	58.4	9.9	64.4	6.3	9.8	4.1	6.0	-3.6

Note. Difference in A-B measures the progress or regression of the student mean from initial baseline to treatment. Difference in B-A measures the progress or regression of the student mean from treatment to the return to baseline.

Table 5

ANOVA for Measures of Student Means for Baseline, Treatment, and Return to Baseline

	SS	df	MS	F	*p*
Between Groups	1,145	2	572.5	10	0.001
Within Groups	1,373	24	57.2		
Total	2,518	26			

Note. N = 9.

mean pairs (phases) significantly differed. In this analysis, the mean scores from baseline to treatment were significantly different from one another, indicating that students scored higher overall due to the treatment (listening to music) than with no treatment (absence of music) in the initial phase of the study.

Individual Results Better with Music. Five of the nine students performed better on average with music. They were Student 1 (6.3), Student 2 (4.9), Student 4 (6.5), Student 5 (5.2), and Student 9 (20.9). Student 1, Student 2, and Student 9 also had their highest score in the final week of the music (treatment) phase. Student 4 had his highest score in the next-to-last week of the music (treatment) phase.

Student 1, with moderate learning disabilities in reading, mathematics, and speech, went below baseline once, and surprisingly it was during the music (treatment) phase. Student 2, with autism and ADHD, was near baseline twice during the initial phase. Student 4, with moderate learning disabilities in reading, writing, and speech, went below baseline once during the initial phase, and surprisingly returned to near baseline once during the music (treatment) phase. Student 5, with moderate learning disabilities in reading, returned to near baseline twice during the initial phase, and also surprisingly once during the music (treatment) phase. Student 9, with moderate learning disabilities in reading, writing, and speech, returned to near baseline twice in the initial phase, and surprisingly once in the music (treatment) phase. Student 9 was also the only student to regress in any phase, dropping -4.4 from music (treatment) to return to baseline phase. Student 9 also realized a 30-point drop in the first week without the music (treatment).

Better without Music. Two of the nine students performed better on average without music. They were Student 3 (-6.0) and Student 8 (-3.4).

Student 3, with learning disabilities in reading, writing, mathematics, autism, occupational therapy, ADHD, and oppositional defiance, went below or near baseline twice, both during the music (treatment) phase. Student 3 immediately dropped 31 points in the first week with music. Student 8, with moderate learning disabilities in reading, writing, and speech, was near baseline once in the initial phase, and either near baseline or below baseline three times in the music (treatment) phase. Student 8 immediately dropped six points in the first week with music.

Same with or without Music. Two of the students performed essentially the same with or without music. They were Student 6 (0.9) and Student 7 (-1.1).

Student 6, with a communications disorder, was near baseline once in the initial phase, twice during the music (treatment) phase, and once in the return to baseline phase. Student 7, with moderate learning disabilities in reading and speech, was either near or below baseline twice in the initial phase, twice in the music (treatment) phase, and once in the return to baseline phase.

Discussion

Summary of Findings

Although gains and losses were realized in the baseline, treatment, and return to baseline phases, all students improved their writing over the entire course of the study. Data obtained in ANOVA and Tukey's HSD Post Hoc Analysis indicated that the increase in student mean scores from baseline to treatment were a result of listening to music. It may then be determined that using background music as a means to improving writing ability of students with learning disabilities can be beneficial. Individually, five students performed better when background music was utilized, two had similar results with or without background music, and two students performed worse when background music was utilized. Those students who performed better when background music was utilized also had their highest scores in that part of the study.

Conversely, it should be noted that the two students who performed worse when background music was utilized performed at or below their baseline several times in the music (treatment) phase. This suggests that it may be beneficial to incorporate background music to improve writing for students with learning disabilities, but if students drop to their lowest levels, remove the music for those students immediately. Perhaps having the background-music-benefiting students using headphones to play the songs (and thus keeping the rest of the classroom quiet for those who have difficulty when the music is playing) would be a way to incorporate the strengths of all students into the activity.

Also, the data indicates that any change – going from silence to adding music, and then back to silence – results in a large drop in writing performance of students with learning disabilities, and it takes several weeks to regain the progress made in the time before the addition of music. This likely shows that consistency in routine is essential to the academic performance of students with learning disabilities, and that variability or change in routine is both a distraction and a hindrance in performance.

The classroom teacher observed that when he initially began using the music, "a number of students (3-4) commented that they found it distracting and did not want it played; however, once I ended the music, those same students (plus several more) were disappointed to see the music removed."

Limitations and Generalizability

The primary limitation of this study pertains to generalizing the findings to other educational settings. This investigation focused upon the effect of background music on writing performance of students with learning disabilities in a suburban public elementary school in the mid-Atlantic region of the United States. As a result,

external validity is questionable. Appropriateness of the findings of this study should be determined by the consumer of the research.

Another limitation of the study is that specific learning disabilities were neither considered nor measured singularly. All students were grouped together in the Learning Disabilities classroom regardless of their condition. As a result, it cannot be determined if a student with a particular learning disability (for example, ADHD) performed better (or worse) with music or without music.

There was also a lack of qualitative data to support or refute the quantitative findings. There may have been instances where students enjoyed having the music played and performed at a higher level than without it, and conversely may have disliked the music being played and yet still performed at a higher level.

Performance may also have been affected by the scope of the writing prompt administered. Although *AIMSweb* probes were utilized in sequence, probes may have been of varying interest to the students, and personal connections may have been made at varying degrees based on a student's background knowledge.

The study may also be more advantageous to occur over a longer period of time than 21 weeks. Perhaps an entire year-long examination would yield alternative results.

Recommendations

It may be beneficial to conduct this study utilizing an experimental design with independent samples, comparing like-groups over a period of time with one group utilizing music (treatment) for the duration and the other group being denied music for the duration of the study.

It may also be beneficial to conduct this study in alternate settings – with younger or older students, private or parochial schools, or even utilizing different types of music – to either validate or refute the results found in this examination.

Implications for Practice

Background music improved the writing ability of students with learning disabilities overall as compared to writing in silence. Incorporating music into writing exercises and activities is sound pedagogy. However, consistency in routine appears to be more essential to the academic performance for students with learning disabilities than the presence or absence of background music.

References

Collett, M. (1992). Music as the basis for learning. *The Education Digest*, *57*, 61-64. Retrieved from Education Full Text database.

DiEdwardo, M. (2005). Pairing linguistic and music intelligences. *Kappa Delta Pi Record*, *41*(3), 128-130. (ERIC Document Reproduction Service No. EJ773903) Retrieved from ERIC database.

Donohoe, R., & McNeely, T. (1999). The effect of student music choice on writing productivity. (ERIC Document Reproduction Service No. ED448472) Retrieved from ERIC database.

Ebisutani, K., Donlan, D., & Siebers, E. (1991, January 1). The effects of music on reading, oral language, and writing abilities: A review of literature. (ERIC Document Reproduction Service No. ED333356) Retrieved from ERIC database.

Gay, L. R., Mills, G. E., & Airasian, P. (2009). *Educational research: Competencies for analysis and applications* (9th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Kariuki, P., & Honeycutt, C. (1998). An investigation of the effects of music on two emotionally disturbed students' writing motivations and writing skills. (ERIC Document Reproduction Service No. ED427491) Retrieved from ERIC database.

Klassen, R. M., & Lynch, S. L. (2007). Self-Efficacy from the perspective of adolescents with LD and their specialist teachers. *Journal of Learning Disabilities, 40*(6), 494-507. Retrieved from EBSCOhost.

Lapointe, J. M., Legault, F., & Batiste, S. J. (2005). Teacher interpersonal behavior and adolescents' motivation in mathematics: A comparison of learning disabled, average, and talented students. *International Journal of Educational Research, 43*(1/2), 39-54. Retrieved from EBSCOhost.

Lincoln, A., & Chazan, S. (1979). Perceived competence and intrinsic motivation in learning disability children. *Journal of Clinical Child Psychology, 8*(3), 213-216. Retrieved from EBSCOhost.

O'Bruba, W. (1987). Reading through the creative arts. *Reading Horizons, 27*(3), 170-177.

Powell-Smith, K. A., & Shinn, M. R. (2004). *Administration and Scoring of Written Expression Curriculum-Based Measurement (WE-CBM) for use in general outcome measurement (AIMSweb Training Workbook).* Eden Prairie, MN: Edformation, Inc. Retrieved at http://www.aimsweb.com/uploads/pdfs/AdminAndScoringWe-CBM.pdf

Psychology World. (n.d.). *Tukey's HSD Post Hoc Test Steps*. Retrieved at http://web.mst.edu/~psyworld/tukeyssteps.htm

Schuster, D. H. & Vincent, L. (1980). Teaching reading and math with suggestion and music. *Academic Therapy, 16,* 69-72.

Article Citation
Legutko, R.S., & Trissler, T.T. (2012). The effects of background music on learning disabled elementary school students' performance in writing. *Current Issues in Education*, *15*(1). Retrieved from http://cie.asu.edu/ojs/index.php/cieatasu/article/view/568

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Current Issues in Education
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Manuscript received: 5/28/2010
Revisions received: 9/19/2011
Accepted: 12/8/2011

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PO Box 37100, Phoenix, AZ 85069, USA

Volume 15, Number 1 January 1, 2012 ISSN 1099-839X