

READING TO THE BEAT

A Learning Through Music-Language Arts Curriculum Intervention

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In music-in-education laboratory schools, it is not unexpected that teachers and consultants invent new ways to incorporate music into the curriculum. In this case, Jennifer Vaillancourt, Sandi Likely, and LTM Consultant Dee Lundell initiated a pilot study focused on the effects of music for Ramsey's most challenged third grade readers.

THE PROBLEM

Some students arrive in third grade at Ramsey without having mastered high frequency/sight words. This interferes with fluent reading and affects their comprehension. They are identified as struggling readers and need a major intervention to catch up with grade level reading skills. The students demonstrate disfluent, choppy oral reading. There is little to no automaticity in their reading and thus no smooth "flow."

THE INQUIRY QUESTIONS

- How can music be used to actively engage the students in learning and developing automaticity of high frequency/sight words that will increase their reading fluency?
- More specifically, will using rhythmic beats using rhythm sticks and taiko drums increase the fluency of sight/high frequency words?
- What is the effect of drumming in a circle?

THE LEARNING THROUGH MUSIC PLAN: A DRUM CIRCLE/RHYTHM STICK/WORD FLUENCY INTERVENTION

STEP 1: Identify concepts and processes shared between language reading and music

Because the classroom teacher, Jennifer Vaillancourt, and special education teacher

COMMENTS ON THE OPERA PROJECT FROM THE RAMSEY TEACHERS

Most of Ramsey's teachers bring their classes to the opera performance. Comments from classroom teachers, music teachers, and parents (Figure 50) reinforce the value of the program from the whole-school perspective (RUBRICS CUBE Rubric 7):

"I take my students every year to see the 4th grade Opera because they get excited to see what they're going to be doing next year."
--3rd grade teacher

"I notice my kids know a lot about Minnesota history because that was the topic of their opera the previous year."
--5th grade teacher

"This year's was the best ever. Really liked the balance of singing, dancing, solos...and the sets were fantastic. First time ever that strings were incorporated. It was apparent in this opera that all kids had both chorus and stage time."
-- Spanish Fine Arts teacher:

"Really liked the involvement of all the students. Didn't remember that we had that many involved in the past... Could understand all the words. Very well done."
-- Music teacher:

"Greatest yet. Loved the involvement of all the students. Noted the positive climate between audience and students."
-- Another Music teacher:

"Congrats. I had a great discussion with my students about natural disasters following the opera and found that my students didn't know much about earthquakes."
--5th grade teacher:

"I didn't bring my video camera because I thought it would be just another kid's school performance. This was so much more. I regretted not having my camera, but now that I know the school has a DVD of the performance, I'm definitely buying one."
--4th grade parent:

"I can't wait until I'm in 4th grade so I can be in the opera."
-- Younger sibling of 4th-grader

Student, classroom teacher, and music teacher comments on the Ramsey Opera project.

and taiko drummer, Sandi Likely, were part of the LTM project, they decided to design an intervention by looking at the concepts, processes and skills shared between music and language reading to design lessons for increasing the fluency of sight/high frequency words.

Students lacking word fluency skills read slowly, a word at a time, often pausing between words or phrases; they make frequent mistakes, ignore punctuation marks, and read in a monotone. Fluent readers know the words automatically and therefore move easily from word to word.

Thus, the collaborative team found that skilled music performance and proficient sight word reading skills share the following concepts and qualities:

- *Rhythm*: movement, flow; characterized by regular recurrence of beat, accent
- *Tempo*: the speed at which a task is performed with a good pace and with phrasing and expression; rate of activity, timing
- *Fluency*: flowing smoothly; ease in speaking, performing, problem solving

MS. LIKELY WOULD SET THE BEAT WITH THE DRUM. THE BEAT STARTED AT ABOUT 1 BEAT PER SECOND TO GIVE THE STUDENTS A CHANCE TO COORDINATE THE BEAT WITH READING THE WORD. THE STUDENTS COPIED THE BEAT WITH THEIR RHYTHM STICKS. ONCE THE BEAT WAS WELL ESTABLISHED, MS. LIKELY ANNOUNCED THE LIST TO BE READ. THEN SHE CUED THE CLASS WITH "ONE, TWO, READY, READ!"



Professional development for teachers at Ramsey included drum circle facilitation with rhythm sticks provided by musician and music therapist Kathy Quain from Music in Schools Today, a Learning Laboratory School Network member in San Francisco.

Having the students gather in a circle can help create community; in the circle there is no hierarchy and a sense of equality prevails [Stevens 2003, p.16]. The activity of group drumming alone inspires success and creates a common pulse that builds unity [Ibid., p.13]. A state of flow can be accomplished in a drumming circle. Students can meet the flow criteria of loss of self-consciousness and feel challenged and capable.

STEP 3: Embody word recognition by performing words with rhythm sticks.

The use of rhythm sticks in a drum circle is a purposeful, multi-sensory strategy to engage word fluency skills in musical performance. Drawing on the premise [Jensen 1996] that "when information is imbued with music, there's a greater likelihood that the brain will encode it into long-term memory" and that drumming would get the students immersed a "flow" state in which one "loses oneself" in the skilled performance [Ibid., p.43; Csikszentmihalyi 1991], the team decided that the instructional strategies/activities would include the use of rhythm sticks, taiko drum, Fry's Instant Word list, choral reading, drum circle, and call and response.

IMPLEMENTATION AND ASSESSMENT GOALS

The instructional intervention activities for the 45-minute reading class included work on phonics rules, repeated practice reading easy text, work on comprehension, and practice identifying and reading sight words in conjunction with using the rhythm sticks in drum circles as a strategy for activating high frequency/sight words through the musical processes engaged in rhythmic performance. Learning goals for the 45-minute reading class were (a) to increase student speed, fluency, and confidence when reading words from the Fry Instant Word list in rhythm, and (b) to move these students from slightly below grade level to grade level reading as measured by the District Curriculum Based Measures of reading skills.

DESCRIPTION OF BELOW GRADE LEVEL STUDENTS

Of the 88 third grade students enrolled in September 2004, ten students were assigned to the below grade level (BGL) reading intervention group. All of these students demonstrated reading that was halting and slow. They had difficulty with

sight words, showing no automaticity. Most of the high frequency words are not phonetically regular. Phonics strategies don't work for sight words, and the students didn't understand this. They did not have immediate recognition of these words, which slowed their reading and naturally affected their comprehension.

LESSON DESIGN ELEMENTS

The collaborative team decided to use Edward Fry's Instant Word list of 1000 most common words. The lists are broken up into blocks of 100's. The "first twenty-five words make up about a third of all printed material," while the first 100 "make up about half of all written material" [Fry 2004 p. 23; Beers 2003 p. 327]. The team used the words in block lists of 25 at a time. Each list increased in difficulty. List 1-25 was much easier than list 101-125. Over the year, only the first 300 words, those that are common through 3rd grade, were used in these lessons. If a child can read all 300 words, s/he knows about 65% of all words in any book. [Beers 2003 p.327]

For ten minutes two or three times a week, the students and two teachers were gathered in a circle on the floor. Each student and one teacher had a pair of rhythm sticks. One teacher had the "taiko" drum. The taiko-like drum was made from half a globe with the opening covered in booktape. This "taiko" drum was easy to store and transport. Everyone had a paper with a group of 25 words from Fry's list. The class started with Group 1a, the 25 most common words found in any book.

THE INTERVENTION METHODS

Ms. Likely would set the beat with the drum. The beat started at about 1 beat per second to give the students a chance to coordinate the beat with reading the word. The students copied the beat with their rhythm sticks. Once the beat was well established, Ms. Likely announced the list to be read. Then she cued the class with "one, two, ready, READ!" The class read the list—one word per beat. The routine was generally as follows, but because this was an organic, living process of student

TIMES FOR INDIVIDUAL STUDENTS READING OF HIGH FREQUENCY/SIGHT WORDS			
READ	COLD READ	8th day of PRACTICE	COLD
STUDENTS	(pre-test) Group 1a 1-25	(practice effect) Group 1a 1-25	(post-test) Group 2a 101-125
A	13	8	15
B	18	13	15
C	16	11	18
D	17	11	17
E	18	9*	11*
F	18	11*	11*
G	20	15	17
H	21	9*	12*
I	23	13*	13*
J	13	9	13
Average	17.7 (n=13-23)	10.9 (n=8-15)	14.2 (n=11-18)

* = Highest rate of improvement from the pre-test to treatment or post-test. The highest rated of fluency within each test is marked by yellow highlight.

The data presented here show that all students in the LTM reading intervention cohort were able to improve their reading fluency in practice trials, and that 6 out of 10 students improved on their post-test scores.

involvement, it varied creatively as the students succeeded. The variety was necessary to keep students engaged.

The class would read the list to a slow or moderate tempo. Tempo had a powerful effect of creating feeling or mood within the drum circle. Research [Marsalis 1992, p.35; Byrne, et al. 2002] has found in creating optimal experience that activities become rewarding experiences if the activity is structured so that the students' skills are matched with the challenge of the action. Accordingly, the initial beat proceeded at a slow tempo. However, if the tempo was too slow, individual students would start putting in counterbeats and the class would lose the rhythm. As the students got into the flow or 'groove' of successfully reading the list (usually within 3-4 times), the tempo would be increased.

The list was read in sequence. As the class was successful with the list, Ms. Likely would present them with challenges (e.g., dividing the class in half, with each half reading every other word; dividing the class into boys and girls reading every

other word). Further variations were employed to prevent students from learning by rote:

- The list was read from the bottom up or they would read only the odd (or even) words.
- Students read the list softly or loudly.
- As students were successful, variety was introduced.
- As the class was successful, they would move on to a more difficult list for 3 or 4 mostly successful times.
- The class would revisit a previously successful list and speed up the tempo.
- When a class was successful on a given list, students took turns leading the circle, setting their own tempo.

As suggested by Byrne, et al. (2002), when the students' reading while drumming became automatic, they lost their hesitancy and apparent self-consciousness about reading aloud [3].

3RD GRADE DISTRICT CURRICULUM BASED MEASURE (CBM) SCORES				
[correct number/minute]				
(77/wpm is the third grade level standard for fall 2004)				
STUDENTS	FALL 2004	WINTER 2005	Fall-Spring	
			SPRING 2005	Pre-Post
A	81	86	90	+9
B	67*	79	85	+17
C	83	97	114	+31
D	61*	81	99	+38
E	86	113	122	+36
F	67*	82	102	+35
G	58*	85	NA	NA
H	63*	97	91	+28
I	67*	79	89	+22
J	86	106	121	+35
Average	71.9	90.5	101.4	27.9

*significantly below MPS grade level expectation in the fall of 2004
yellow highlight = highest level improvement from fall to spring test results

The data show that all students in the LTM reading intervention cohort improved in pre-post tests of word fluency, though the intervention appears to have affected some students much more than others.

THE DATA

The students were given a group of words from Fry's List of Instant words to read in a "cold read." They had as much time as they needed to complete the reading. The students were provided unknown words after three seconds. The times for reading the high frequency/sight words are listed in the table on the previous page.

The preliminary results of the drum circle intervention and its impact on word fluency post-test scores are impressive. On the cold read pre-test of the first group, it took the students a range of 13-23 seconds to read the list correctly with an average rate of 17.7 seconds. After 8 days of 10 minutes practice each day, the range of seconds for correct reading had fallen to 8 to 15 seconds with an average rate of 10.9 seconds. The cold read post-test range was 8-15 seconds with a 14.2 average, an improvement of 3.5 seconds over the average of the pre-test, a finding that stands as persuasive evidence that the intervention significantly improved sight word fluency.

Furthermore, individual analysis indicates that four of the five students who

improved the most in the intervention timing (as indicated by asterisks in the middle column for students E, F, H, and I) were also the most improved on the second cold reading (also marked by asterisks in the right column). Evidently rhythm-based practice with word reading appears to improve cold reading fluency scores.

Note also that two students (A and J) who recorded fast times in the intervention tasks (marked by yellow), did not improve on their post-test timing. For the reading specialist, the reason for poor word fluency scores on the part of these students probably is predicted by other cognitive challenges to word fluency not addressed by the social and musical-cognitive effects of the rhythm stick circle intervention.

The Curriculum Based Measures test results for the intervention students are shown above. First, it should be noted that all LTM intervention students had met fall Grade 3 level standards by the winter of the academic year. These scores suggest that these students were delayed in the word reading proficiency level by only a few months, yet they all made substantial progress by increasing their average word proficiency rating by 28 words per minute

in conjunction with the rhythm stick circle intervention.

In the case of intervention effects transferring directly to CBM scores, the results are less conclusive. Three of the four students who showed the most dramatic changes in word fluency scores at first did improve dramatically on their word fluency (CBM) test scores. Unfortunately, the teachers did not keep records of follow-up word fluency tests, so it is impossible to know which students benefited most from the word fluency intervention by the end of the year.

However, this much we do know: when comparing word fluency performance (CBM scores) between the fall of 2004 and 2005, there was a positive change in grade level ratings. In the fall of 2005, six out of ten students registered 10 or more words per minute lower than the district standard for grade three (see table on left). In 2006 only one of eight students returning to Ramsey received this negative rating (see table on right).

In addition, four of the eight students in the intervention study who planned to return to Ramsey in the fall of 2006 (one moved at the beginning of the year) were placed in 'at grade level' reading groups (see table on right).

WHAT THE TEACHERS LEARNED

From the RUBRICS CUBE system point of view, this study demonstrates teacher professional development as music-in-education action researchers. A third grade teacher and a special education teacher-musician, both guided by LTM consultant Dr. Dee Lundell, started with inquiry questions based on the Learning Through Music frameworks, and the LTM team devised a language arts intervention that led to many kinds of outcomes.

How can music be used to actively engage the students in learning and developing automaticity of high frequency/sight words that will increase their reading fluency? The answer comes from the description of the intervention itself and the evidence of its effects on the experi-

mental subjects in this study. The evidence presented here suggests that using rhythmic beats with rhythm sticks and taiko drums increases the fluency of rehearsed sight/high frequency words and, in some cases, predicts faster processing of new groups of sight words. Anecdotal evidence of the effect of drumming in a circle describes the enthusiasm of students who had begun to disengage from conventional instructional practices.

As seen above, the curriculum design was clearly focused on the application of musical processes and concepts to solving symbolic literacy problems that occur in both language and music reading. In the integration of both disciplines, students benefited from a 'flow condition' of translating symbols to action fluently and meaningfully in conjunction with rhythmic performance. The student performance documentation and assessment methods capture the effectiveness of this integration of rhythm reading, though it is most unfortunate that the data collection was limited to the early stages of the project. Clearly the intervention results, though preliminary, demonstrate both the promise and challenges of conducting action research in schools when faculty are responsible for both teaching and documenting the progress of new strategies for engaging 'at risk' readers in an urban school setting.

As the classroom LTM intervention continued throughout the year, the classroom culture changes were noteworthy. Students became immersed in the drumming. They got into the "flow" and were enjoying it, and as a result became active and involved readers in class and at home. As the classroom teacher Jennifer Vaillancourt recalls,

"One of the students had become so involved with the drumming rhythm that when he sat reading silently during his other reading activities (SQUIRT), he tapped a steady rhythm on his desk. Another student improved so much in reading fluency that in fourth grade she has become an avid reader, reading a grade level chapter book almost daily. Her parent also reports that she now reads daily at home."

4TH GRADE DISTRICT CURRICULUM BASED MEASURE (CBM) SCORES	
[correct number/minute 4th grade]	
(94/wpm is the fourth grade level standard for fall 2004)	
STUDENTS	FALL 2005
A	90
B	74*
C	102
D	101
E	107
F	89
H	101
I	NA

*Students significantly below grade level in fall of 2005
Highlighted in yellow are the fourth grade students placed in grade level reading groups at the beginning of the year

The data show that only one LTM intervention student is significantly below reading level by the fourth grade; only 3 out of 7 students were admitted into grade level reading groups.

THE EVIDENCE PRESENTED HERE SUGGESTS THAT USING RHYTHMIC BEATS WITH RHYTHM STICKS AND TAIKO DRUMS INCREASES THE FLUENCY OF REHEARSED SIGHT/HIGH FREQUENCY WORDS AND, IN SOME CASES, PREDICTS FASTER PROCESSING OF NEW GROUPS OF SIGHT WORDS. ANECDOTAL EVIDENCE OF THE EFFECT OF DRUMMING IN A CIRCLE DESCRIBES THE ENTHUSIASM OF STUDENTS WHO HAD BEGUN TO DISENGAGE FROM CONVENTIONAL INSTRUCTIONAL PRACTICES.

In terms of contribution to the Ramsey School and the field of music-in-education, this study provides a model for teacher action research that, if pursued further, will lead to more sophisticated and generalized results based on the following questions:

- Will drumming have an effect on increasing the fluency rates on the 'above grade level' and the 'at grade level' readers?

- What effect does rhythmic drumming to increase automaticity of high frequency/sight words have on students' attitudes toward reading?

- What effect does reading to rhythmic drumming have on students' attitudes toward recreational and academic reading?

- "Reading to the beat" was done with a