2016 - 2017 AESN / NOII Case Study

School Name: Edwin S Richards Arts-Based Curriculum School

School District: SD#75 Mission

Inquiry Team Members: Sharon Widdows (vice-principal), Kristy Hackel (Aborigina Liaison Worker), Melinda Dempster (principal)

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Type of inquiry: AESN

Grade levels: Primary (K - 3), Intermediate (4 - 7)

Curricular area(s): Mathematics / Numeracy

Focus area(s): Aboriginal understandings (for example, Traditional Knowledge, oral history, reconciliation)

In one sentence, what was your focus for the year?

Our focus this year was improving numeracy (problem solving, basic math facts, and fractions) through drumming (Aboriginal, Celtic, African, and Fuse Drumming) by creating math/music activities which were cultural, reflective, and experiential.

Scanning: Briefly summarize your scanning process. How did you use the four key questions as part of the scanning process? What did you notice about the experiences of your learners that were most important to your team?

We scanned all Aboriginal learners and three non-Aboriginal students in each class. We learned that 50% of our learners felt that math was difficult, and just over half of those were Aboriginal learners. As an art-integrated school, we wanted to explore how music (particularly drumming) might help students embody new math concepts and basic math facts. Drumming circles focus on self and community and are experiential, relational, and reflective, which we felt aligned very well with the First People's Principles of Learning "Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place").

Focus: In a few sentences, explain why you selected this area. What changes were you

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hoping to obtain for your learners?

We know that we can only be sure that students understand a concept when they can apply it in another context, and that while students can often complete math assignments in class, they cannot always transfer these skills in other contexts. We also know that we notice when students are experiencing music in a meaningful way (embodiment). Therefore, we hoped that the physical action of drumming, the responsibility of being a member of the circle, and the mathematical nature of music (timing, counting, fractions) would lead to more meaningful understanding of certain areas of math (basic math facts, problem-solving, and fractions).

Hunch: Describe your hunches about the ways in which practices at the school may have been contributing to the experiences of your learners that were of concern to you.

As an arts-based curriculum school, our goal is to integrate arts across the curriculum. Staff have indicated that math is an area in which it can be more difficult to do this. While math is an integral part of music, the two are not typically combined in the math classroom. We hoped that drumming could be a mediator that could enhance math experiences in the classroom.

New professional learning: What new areas of professional learning did you explore? What resources were most helpful? What specific designs did you use to support the learning of your colleagues?

Our staff participated in a professional development session on integration music and visual arts in the math classroom. Our music specialist participated in a professional development opportunity that was offered by Sherry Sewepegeham, an Aboriginal musician/composer/teacher. She gifted her Aboriginal drumming and songs to music educators to that they could infuse Aboriginal ways of knowing into the music classroom and could perform drumming and singing without breaching protocol. All of our classes participated in Halq'emeylem language lessons and students were able to use some of the language in the new songs. Teachers also learned about the Math Catcher Outreach Program at SFU and used some of the stories in their classrooms.

Taking action: Describe strategies you and your team decided on and how your actions worked out.

The music specialist taught students basic drumming techniques and note value. Addition

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and multiplication questions were written in musical notation and students developed mental math abilities by working through the questions to find the answers. In addition to students learning drumming in the music room, the music specialist described some drumming/math activities classroom teachers could use in their day to day teaching of math. Students would respond to oral math questions by beating the answers on drums. After students had participated in the drumming circle/math activities, they were asked to provide written comments on whether they felt drumming could help them learn and remember basic facts and multiplication tables.

Checking: Summarize the differences you made. Were they enough? Were you satisfied?

We were very satisfied with some of the responses from students. The hope that drumming could help students embody basic math facts was evident in some of their written responses eg. "Drumming can help me learn math because if I have to add 4 plus 7 I can play four beats and play 7 more, and the answer is 11 - I can feel the answer". We feel that this is indicative of the arts providing another 'lens' through which students can embody math concepts and facts. Teachers used traditional forms of assessment and evaluation beforehand to determine students' feelings about math and the written responses by students afterwards to assess the project. Many students have expressed an interest in using drumming at home to practice math and are looking forward to sharing their new skills with others. This indicates that they know where to take their learning from here. Students also demonstrated an increased understanding of the cultural importance of Aboriginal music when they had the opportunity to perform Aboriginal drumming and singing at our community's 125th birthday celebration. This, we feel, aligns well with the First People's Principals of Learning in that they were given the opportunity to share their knowledge because of specific permissions allowing them to participate without breaching protocol. Students have demonstrated an increased understanding that caring about music in culturally specific instances is inclusive and promotes caring about their own culture as well. They know that staff care about their learning and are willing to explore unique ways to support them. In addition, Aboriginal students were proud to showcase their cultural music and be leaders in the music room by sharing their cultural music experiences.

Reflections/Advice: Finish by sharing what you learned from this inquiry, where you plan to go next, and what advice you would offer other schools with a similar interest.

We learned, first of all, that integrating music into the math classroom can promote a deeper understanding of some math concepts/facts, and that using cultural music in particular offers Aboriginal students the opportunity to share cultural knowledge and

develop leadership skills within their class. We would like to suggest that the above described lessons/activities took place over several months, and while we are encouraged our experience, note that continuing to use this strategies over a longer period of time would proved more accurate data; students found the project to be enjoyable and a novelty, so observing students' acquisition of math facts and concepts taught this way over time would be a better indicator of whether or not music could contribute to long-term retention of math knowledge.