



2015-2016 NOII Case Study

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District: #35 Langley

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Our focus for this year: How can the new BC Curriculum facilitate inclusion, inquiry, innovation and Universal Design for Learning principles with robotics particularly with vulnerable girls, gifted students, Aboriginal students and the students in our K-7 school?

Scanning: By using the four key questions as a scanning process, we noticed that the children were very reflective in the process. Two children that were interviewed and engaged in our INSPIRE Project shared their experiences throughout this year. The first question seemed to strike them the most out of the four questions. A Grade 5 student shared that two adults believed in him and I shared it with the named educators. One of them was almost moved to tears over the thought that this child valued her so much. It was beautiful to see that believing in a child has as much impact on the child as it does on the adult.

Our learners were engaged in the INSPIRE Project. Two children had various needs and therefore there was some adapting that needed to happen so that both of the children would be successful in their engagement in coding with robots. As well, we believe it allowed both children to be more inquisitive and curious. We encouraged the children to ask questions, even 'crazy' questions. It was fun and engaging which facilitated wonderful conversations with both children.

The OECD Principles of Learning brought great wealth to our INSPIRE Project! With learners at the centre we were able to allow our focus to be student-directed and even student-led which allows a lot of freedom for creativity and innovation. Students were constructing their own code and were testing out various ways of using the robots. It was great to see the project that got students out of their desks and moving together in groups to interact with the robot. This facilitated lots of time for collaborative work and methods to overcome obstacles or difficulties in learning the robots and coding. The emotions that the children went through ranged from excitement and anticipation to frustration and trepidation; overall it was wonderful to see the various opportunities for autonomous learning.

Another important principle was the importance of recognizing differences and celebrating differences. The importance of respecting your group, other students and the robots was highlighted in our year-long project. It allowed students to be stretched and look beyond their 'familiar' experiences. The assessment for learning was through various methods of examining the engagement from the children. We found that students actually sort out feedback in their process of learning to innovate in coding a robot. Our INSPIRE Project has shown wonderful 'horizontal connectedness' which was valuable. Students were wanting to participate in the INSPIRE Project in their spare time, and there was an engagement to learn outside of the

classroom space. Educators, students and families were going home and purchasing robots and coding up a storm!

Focus: One targeted group in our INSPIRE Project, was a group of vulnerable girls. We wanted to be able to discuss the importance of Science, Technology, Engineering and Math (STEM) and the fascinating aspects of coding. This was done through one-on-one, small group and large group discussions. We were able to have a pre-questionnaire and post-questionnaire for the group, and it was so exciting to see the excitement the group had for coding and robots. Even months after the club, the girls were eager to have it start up again. The changes in these girls' lives were significant which was heart warming to see. Please feel free to look at www.mrspimentel.wordpress.com which documents our journey through the INSPIRE Project and how it is truly inspiring many!

Hunch: Our hunch was that the INSPIRE Project would spread excitement about robots and coding in our school and in our greater community - which it did! It was so exciting to see students, educators and families excited about the potential of innovation and inquiry. It was great to see that the project was a 'game changer'. Children have been asking for more and more and more which shows the excitement and joy. Two boys came up to me and wanted to start a coding club! The passion has been lit and we are so excited about it!

New professional learning: We have never worked with Robots before, so it was a high learning curve (and still is). Over this last year we learned how to teach learners, ages K to 7, to code robots. It was exciting to instruct the learners in coding and programming with robots. The best resources were websites, shared lesson plans, networking, collaboration opportunities with Science World and conversations with others in our community. It has been an amazing opportunity to work with the Ministry of Education in the Innovation Partnership as well as share our experiences at Professional Development Day, Curriculum Implementation Day, a district meeting and at a provincial conference.

Taking action: Here are three strategies we used to implement the INSPIRE Project:

1. Share

It was important for us to be able to share in various platforms. The platforms ranged from Robotic Showcase, INSPIRE Series, INSPIRE Workshops, INSPIRE min-workshops, social media, posting our journey on www.mrspimentel.wordpress.com, talking to others, allowing others to contact us with questions and queries and also to allow open communication as a team. Mentorship was also very important, such as side-by-side teaching, which we found very valuable.

2. Simplify

Many were overwhelmed simply with the word 'coding' so it was important for us to simplify, even 'hand-hold' educators who were not sure what to do. Ironically, the students were the ones that were in there innovating and exploring. We made communication simple and easy.

3. Organized

It was important for us to be organized. With robots in schools being very new it was important that the students as well as the educators felt confident that we knew what we were doing. It was valuable to outline the lesson plans for them so they knew what, when, why, who and where the INSPIRE Project was involved in their classrooms.

Checking: The differences were significant and more poignant due to the year long experiences for our two learners with various needs. We are satisfied, though left with more inquiry questions about their learning. The four sets of answers in the fall were more inquisitive statements or questions. The last set of answers in the spring were more judgmental and opinionated. In hindsight, we should have added an additional question, 'What questions do you have?' We would have been interested in exploring the development of questions for both of these learners.

One student with special needs was very opinionated and honest about his experience with the robots and how truthfully he didn't like them, yet failed to realize that there are many robots out there. What might have other robots triggered for him? We believe that the type of project we did was a very hands-on experience. With both students having limited vocabulary, we wonder if the four questions were expressed through an art project or through body movement, maybe we would have been able to capture their full understanding of the experience?

Reflections/Advice: We have begun trailblazing this year and want to continue to inspire students, teachers, school leaders and families. We set out to purchase a variety of robots and learn about codeable robots for learners ages 4 to 13. With hands-on experience with various robots, we have learned the pros and cons of each robot and the types of robots that fit particular age groups. We have also learned that it is important to support educators who are stepping out to teach their students about coding and robotics. It is alright to make mistakes and allow the students to know that we are learning with them. At times, we realized that it is fine to let the children lead the enthusiasm of the Project!

In the future, we want children to build their own robots, we would like to do more workshops for educators, as well as provide opportunities for the community to engage with coding and robots through Robotic Showcases. In addition, we have started a collaboration with Science World and other groups that are interested in promoting STEM for all children to engage and innovate. The beauty of innovation is that engagement and exploration with the robots can improve learning, build community and give success through discovery together. We are excited to see our students engaged with ownership of their learning through invention, creation and exploration through robotics and coding... So let's get INSPIRED!

Advice for other schools pursuing coding through educational robots...is just go for it! There is so much to learn and it can be intimidating learning a new language like coding, but just start. Do not be afraid of failure! We have learned that problems and complications occur but be creative and innovative in the moment and then debrief and collaborate afterwards to come up with the best plan for moving forward.



FOUR KEY QUESTIONS THAT MATTER

An essential part of the scanning and checking phases of the spiral of inquiry

Purposes: To gain deeper insights into your learners and their experiences. To get feedback from your learners regarding the extent to which they feel connected to adults within the school. To develop an understanding of the extent to which your learners own their own learning. To reflect with your colleagues on what the learners' responses imply and the actions that you might take as a result.

Advice: Start with just one or two learners with the ultimate goal of involving as many learners as possible. Explain to them why you are asking these questions. As necessary, adapt the wording to the age of the learner. **DO NOT** change the INTENT of the question. Record their responses verbatim. Get together shortly thereafter with your colleagues to review the responses - and the implications. Keep at it. It takes time to develop confidence and ease with these questions.

| Question | Learner Response |
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| <p><i>Gr. 5 boy Age: 10</i></p> <p>Can you name TWO adults in this school who believe you will be a success in life?</p> <p><i>How do they show you that they believe in you?</i> Some discussion about what is meant by success in life may be appropriate. From our perspective, success in life must include crossing the stage with dignity, purpose and options for life after secondary school.</p> <p>Listen for: the extent to which students can provide specific examples of the range of ways in which adults are demonstrating their belief in their future success.</p> | <p><i>Mrs. Pimentel and Mrs. Liske</i></p> <p><i>"I want you to succeed in school and stuff"</i></p> <p><i>"You be nice to me"</i></p> <p><i>Success in life... I don't know... something will work... I want to make lots of money like a vet.</i></p> |

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| <p>Where are you going with your learning?</p> <p><i>What are you learning? What are the big ideas you are exploring? Why is this important?</i> Make it clear that your question is about what they are learning in school right now - perhaps in a specific subject area.</p> <p>Listen for: The purpose of what they are learning in their own words. The distinction between the task (what they are <i>doing</i>) and the purpose (what they are <i>learning</i> and why). See if they can connect it to life outside school. Probe as much as you need to get a full picture of the depth of their understanding.</p> | <p><i>I really like field trips like Playland. I am learning a lot of stuff and keeping on task. I'm trying to figure some things out and I have trouble getting things written down. But I'm doing pretty good at getting some things done. It's hard work for me sometimes.</i></p> |
| <p>How are you doing?</p> <p><i>What would you like to tell others about how you're doing with your learning? How do you know how you're doing?</i></p> <p>Listen for: The extent to which learners understand the criteria for strong work in this particular area. Can they identify their own strengths and the areas for additional focus? Have they internalized the criteria or are they solely dependent on teacher judgment? What kind of feedback have they received? From whom?</p> | <p><i>I'm into video games and stuff like computers. I found the robots hard to get interested in it so I don't get much done. I'm doing okay because I stopped making bad, bad choices. I've stopped getting in trouble.</i></p> |
| <p>Where to next?</p> <p><i>Tell me what the next piece of learning is for you. What do you need to do to get better at this?</i></p> <p>Listen for: Do learners know what they need to do to get better in this particular area of learning and how they will do it? Can they articulate the specific next steps?</p> | <p><i>I'd like to get better at learning about vet. The idea of being a vet when I'm older. I like animals... I just like them.</i></p> |



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| Question | Learner Response |
|--|--|
| <p>Gr. 1 student age 6</p> <p>Can you name TWO adults in this school who believe you will be a success in life?</p> <p>How do they show you that they believe in you?</p> <p>Some discussion about what is meant by success in life may be appropriate. From our perspective, success in life must include crossing the stage with dignity, purpose and options for life after secondary school.</p> <p>Listen for: the extent to which students can provide specific examples of the range of ways in which adults are demonstrating their belief in their future success.</p> | <p>Mrs. Cramer Mrs. Pimentel</p> <p>They encourage me and they cheer me on, especially in PE.</p> <p>They help me.</p> |

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| <p>Where are you going with your learning?</p> <p>What are you learning? What are the big ideas you are exploring? Why is this important?</p> <p>Make it clear that your question is about what they are learning in school right now - perhaps in a specific subject area.</p> <p>Listen for: The purpose of what they are learning in their own words. The distinction between the task (what they are <i>doing</i>) and the purpose (what they are <i>learning</i> and why). See if they can connect it to life outside school. Probe as much as you need to get a full picture of the depth of their understanding.</p> | <p>I like testing things out to know if I'm right. I'll know I'm right by trying different ways out. I want to be kind when I grow up.</p> |
| <p>How are you doing?</p> <p>What would you like to tell others about how you're doing with your learning? How do you know how you're doing?</p> <p>Listen for: The extent to which learners understand the criteria for strong work in this particular area. Can they identify their own strengths and the areas for additional focus? Have they internalized the criteria or are they solely dependent on teacher judgment? What kind of feedback have they received? From whom?</p> | <p>I'm doing good with a thumbs up. I like learning Math because I like adding like $1+2=3$. I like robots and coding because it's so cool.</p> |
| <p>Where to next?</p> <p>Tell me what the next piece of learning is for you. What do you need to do to get better at this?</p> <p>Listen for: Do learners know what they need to do to get better in this particular area of learning and how they will do it? Can they articulate the specific next steps?</p> | <p>I would like a drone for our school. It's so cool and we can take video, it can fly, and it can land. It's kinda like spy gear.</p> |