

The teachers who participated in L.C.E.E.Q. Professional Development and Innovation Grant used the time allotted to us to create a comprehensive S.T.E.A.M. plan for our school in correlation with our School Success Plan and the objectives of L.C.E.E.Q.

We began our project with the goal of increasing school wide S.T.E.A.M. activities and help teachers implement its philosophy in order to lessen student anxiety. Over the past four years, results from the Tell Them From Me bi-annual student survey provided evidence of student anxiety on the rise. Incidentally, teachers who had been piloting S.T.E.A.M. projects and techniques saw a marked improvement in student confidence, resilience, self-esteem and risk-taking. It was also encouraging to observe the clear impact that S.T.E.A.M. had on 'at-risk' and 'special needs' learners as well as declines in student stress and anxiety.

While working on our project this year, we found that our goals for lessening student anxiety shifted. The Lester B Pearson School Board is moving toward a new direction to provide opportunities for learning the 6 C's (collaboration, citizenship, creativity, communication, critical thinking, character). We noticed that our colleagues were feeling innondated by this 'new direction' and educational terms. Many of them view these shifts as add-ons to the curriculum that they do not have time for. In order for our project to be successful and for teachers to embrace it, we felt that we needed to help our colleagues better understand that S.T.E.A.M invites deep learning and promotes the 6C's. These should not be seen as individual addons to the curriculum, but rather a culmination of pedagogy that provides students with global competencies that use real-life problem solving skills. Thus, our goals for the approved project took a bit of a new direction from lessening student anxiety to lessening teacher anxiety of 'new' pedagogies and providing students with 'deep learning' experiences. It should be noted that we still believe that student anxiety levels will lessen as a natural result of deep learning through S.T.E.A.M projects.

Coordinating a schedule to work all together proved more challenging than expected. We are a staff of dedicated teachers, so time away from our students seemed daunting. Also, there is always so much going on in the classroom; field trips, exams, classroom visits etc. Ultimately, our project came together through team meetings and by dividing and conquering. However, we wish we could still use the release time remaining to share our discoveries with our peers, have cycle teams plan more extensive projects and have more time for teachers to explore hands on.

In our initial meetings, we discussed our personal/professional beliefs and experiences with S.T.E.A.M. This evolved into finding common goals for setting cross cycle learning objectives (observation and exploration in kindergarten, constructing knowledge with

guidance in **cycle one**, applying that knowledge and elaborating in **cycle two** and then reinvesting and innovating with that knowledge in **cycle three**).

Subsequent days of release were used to conduct and share research on the topic by experts in the field. In addition, we delved into the objectives set forth in the *Quebec Educational Progression of Learning in Elementary Schools* in science, math and the arts.

Midway through the project, cycle 1 and cycle 2 and 3 teachers broke away to plan our own class projects to learn, grow and share with the team. Cycle 1 teachers put together a series of simple challenges for their students while cycle 2 / 3 teachers put together an extensive year long S.T.E.A.M initiative for deep learning with electricity. Throughout the PDIG, we worked with consultants at the school board as well as with the “Creative Open Space” team at LEARN Qc.

A MakerSpace room for S.T.E.A.M activities outside of the classroom was built. The room includes a green screen wall, a Lego wall and several pre-fabricated S.T.E.A.M challenges. The idea behind this room was to encourage teachers (who do not have the time needed to invest in planning and organizing space for S.T.E.A.M activities) to have their students participate.

In our final time together, we worked on tightening a plan to explain the pedagogy behind S.T.E.A.M at Edgewater. In addition to working on student objectives that build on prior experiences from the previous cycle, we purchased materials and equipment with money from Edgewater’s innovation grant. We put together bins with the required materials in order for students to carry out challenges.

Finally, we worked on a plan to share our knowledge, experience and research with the rest of the staff. We will be offering a workshop to our colleagues to better understand the pedagogy behind S.T.E.A.M and the connection to deep learning using the 6 C’s. Teachers will have the opportunity to experiment with the materials/equipment that we have acquired as well as time in their cycles to plan for next year.

As the cycle two S.T.E.A.M project (Ice Storm 2018) ended, we collected evidence of deep learning. After interviewing our cycle 2 students about their learning process during the year’s electricity unit that was composed of Science, Technology, Engineering, Art and Math. Students were able to express how the experience changed their mindset, they acknowledged that failures led to success, that collaboration and communication can be challenging and they revealed personal weaknesses that were

strengthened as a result of the S.T.E.A.M initiative. I feel like a stronger teacher as a result of this project and the teachers and I who worked on this PDIG feel more confident to lead others in taking on this philosophy.

We strongly believe that a true S.T.E.A.M philosophy has numerous benefits for our students. It provides opportunities for high interest and deep learning, it strengthens collaboration, character, creativity and critical thinking. We also believe that student anxiety will lessen when given the opportunity for demonstrating learning outside of the conventional ways (reading, writing, arithmetic).

Providing students with opportunities to think outside the box, problem solve, extend on previous knowledge and learn from mistakes will ultimately produce resilience. In our fast paced 21st century, we need resilient, creative thinkers. We have no idea what jobs we are preparing our students for because they have not yet been created, but we do know that we need to help our students build the aforementioned skills. With them, they will be able to succeed at anything!



