

**Interview with Professor George Meadows**  
**on**  
**How to Make CNRC a Valuable Learning Environment**

By Elizabeth Panner

Interview on September 1, 2020

- How do you reach out to local schools to get projects off the ground?

As a College of Education (COE) faculty member at the University of Mary Washington, I have many opportunities to establish working relationships with local schools. COE students have in-school practicum experiences associated with their education classes, so I work with schools to design those experiences. I also supervise many of our student teachers who spend their fifth year in a particular school. I'll visit the school several times, meeting with the principal and host teacher. I also collaborate with a number of schools on grants and professional development programs for teachers. So, with these relationships in place it's much easier to work with schools and find out what kind of projects they'll be most interested in. That way I can design and develop programs based on what schools see as needs.

- Is the best way to reach students through school programming or through our own programs run at CNRC?

I would say the best way would be through programs developed by CNRC (with input from schools/teachers) and run at the Center or at a school that has shown interest in the Center's programs. School programming can be quite focused on a particular set of priorities determined by that school and it can be difficult to introduce something new into that program. School programming is also subject to change due to circumstances beyond the school's control. For example, a school I worked with developed a great Makerspace Center and made it part of their regular program. But a redistricting decision added a large number of students and the center had to be converted into a regular classroom. Sometimes personnel changes can also bring about changes in programming – a key teacher may leave or a supportive principal might be replaced by one who has different priorities.

- What kinds of materials do educators use on-site at the CNRC?

Generally, we want things that are durable, inexpensive, easy to learn or use, and age appropriate for the visiting students. I'm talking about materials that students and teachers might see in their own classrooms (or even homes) as opposed to expensive, research grade tools.

- How can technology be a part of the learning experience at CNRC? Specifically, can you comment on the use of robotics, computer programs, and engineering design?

Technology most definitely is an important part of a nature-based learning experience. There is a new area of STEM education – E-STEM, with the E standing for Environmental Education. It is

not a replacement for the nature experience, rather it's an enhancement. E-STEM teaching tools might be microscopes, cameras, drones, virtual reality and augmented reality (VR/AR), which offer tech-based ways of seeing things. Technology helps students understand natural processes through the act of collecting information (maybe through environmental sensors or robotics) and then analyzing the gathered information. By using these kinds of tools, students grasp better how technology can be used to address environmental issues such as pollution, loss of habitat, or the need for new alternative energy sources. By going one step further and utilizing the engineering design process that computer programs support, solutions to those problems can be designed, built, programmed, tested, and evaluated.

- Can CNRC provide a meaningful education experience for special-education students in particular?

Definitely yes! There are many articles that discuss the benefits of outdoor nature experiences for special-ed students. I agree with this brief statement:

*“The elements of a traditional classroom are characterized by confinement, harsh lighting/acoustics, and other habitual triggers for sensory discomfort. A natural learning environment can provide students with natural stimuli, fresh air, natural acoustics, natural lighting, etc. Additionally, the natural learning environment fosters a connection with nature, which research shows is important for the self-discovery, self-advocacy, and self-efficacy of all humans.”* West, Denise Elizabeth, “Natural Learning Environments and the Social-Emotional Development of Students with Sensory Processing Challenges” (2018)

These observations really are true for all students, but especially so for special ed students who depend on enhanced opportunities for visual, auditory, and tactile learning.

- Some of the STEM projects you mentioned seem like they may be activities that are hard to execute like ones that utilize an engineering design process. Would that be something that happens at CNRC or in coordination with schools?

For any field trip or activity arranged by the school, kids should be prepared beforehand. While creating and coding a robot may not be feasible, simply using one on the CNRC site would be a way to illuminate how engineering could be relevant to nature. Using drones in the landscape at the CNRC to study specific views or information only available from above is an example.

- The pandemic has thrown into relief the disparity between students who have access to technology and those who might not. Are there activities at the CNRC that don't require technology?

Yes, there are many simpler activities, such as nature journaling where kids write down observations of the world around them. Using a map, an interactive map, or a brochure allows people to take a self-guided tour on the several miles of well-marked trails. There are numerous

different bird-watching locations on the property, and referring to pictures of specific birds definitely accommodates younger kids. Another helpful tool is a simple bug magnifying glass-container. Something fairly big could be put inside it, and they are easier to use than microscopes.