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## Big ideas at little cost: teaching differently

By Nathalie Kinnard

*“Involve me, and I learn,” said Benjamin Franklin. He was right. Children learn better by experimenting, creating and working together. It is not always necessary to have access to the latest technology! A little creativity is all it takes to transform a few everyday objects into a dynamic teaching tool.*

“My class will never be the same,” remarked an elementary teacher who participated in a design thinking and making workshop, better known as a *Maker Day*, in the rural eastern Tanzanian town of Turiani. He and his colleagues made prototype educational tools using bottle caps, pebbles, glue, clay and recycled clothing. They also made an abacus from the branches of a local tree and used it to show young children a different way to count. Recycled cardboard, pieces of wood, ash, reeds, paint and glue became a miniature model of a Tanzanian house. Teachers can use the model to introduce architectural vocabulary, and to teach children to recognize various shapes and measure their width, length and perimeter.

“We wanted to work with educators and discover ways to use the resources in their environment to stimulate learning,” said Susan Crichton, Director of the Faculty of Education at the University of British Columbia Okanagan



Above, a traditional house built from cardboard, mud and paint



Above, a local duck using socks, sponges, mud and metal fastener

campus and the Innovative Learning Centre (<http://innovativelearningcentre.ca/>), a space dedicated to imagining the future of education. As an education specialist, she partnered with Lilian Vikiru, a professor at Aga Khan University in Tanzania, on a research project exploring educational challenges in difficult contexts. Through the **Canada-Africa Research Exchange Grants** program, funded by the **International Development Research Centre (IDRC)**

and managed by Universities Canada, the researchers were able to host three Maker Days: one for teachers in rural areas, and two others at Aga Khan University in Dar es Salaam for the benefit of graduate students faculty, school principals, administrators and representatives from the Tanzanian Ministry of Education.

The Maker Movement

(<http://innovativelearningcentre.ca/our-space/maker-days/>) aims to help

teachers and students use their creativity to think, experiment, design and innovate to create hands on, active learning with their students.

“The goal is to encourage educators and students to move from educational concepts to learning resources, so they can co-develop the knowledge and skills they need to be successful in the 21st-century,”

explains Crichton. This process involved *design thinking*, an approach that foster empathy and human centred problem finding. It is a way to integrate the STEM subjects (science technology, engineering, and math) with language acquisition and active learning. “STEM education does not have to be solely about using technology to help in learning,” she said. “And that’s what we experienced in our workshops in Tanzania. It is about learning to design opportunities and alternatives that make our situations better.” Many rural schools, both in Tanzania and elsewhere, simply don’t have the means or infrastructure to outfit classrooms with iPads and computers. In the village of Turiani, for example, children have only a few textbooks available as learning tools. As Crichton firmly believes, “Schools cannot wait for funding to innovate. Educators can be empowered to think creativity and teach actively using design thinking.”

Researchers Vikiru and Crichton first had to convince school administrators that teaching does not have to be limited to having a teacher expound on theories to students attentively sitting at their desks or on the floor in overcrowded classrooms. In Tanzania, especially in rural areas, education remains very traditional and teacher centred. Typically, teachers teach the ways in which they were taught. Education is very passive, and many children drop out of school as a result. “To hold their interest, we need to involve young people in their learning. Educators must be encouraged to use their environment. They need permission to get out of the classroom and use traditional ways of knowing to explore and learn differently,” said Crichton. As Vikiru notes, that is how the Maker Day participants in Tanzania came to make a duck out of old socks, bits of sponge, cardboard, buttons, paper, glue, paint and clay. Ducks are domesticated animals that live in most Tanzanian families’ yards and are therefore part of children’s lives. The model can be used to talk

about the animal, its environment, its diet and how it differs from other animal species found in Tanzania.

Following the workshops, the researchers passed the torch to two Tanzanian teachers tasked with furthering the design thinking movement in their communities. With this in mind, Susan Crichton and Lilian Vikiru created a practical guide for designing and making low-cost pedagogical tools, available online in English and Swahili (<http://innovativelearningcentre.ca/our-space/careg-project-page/>). Since it was published in 2015, the guide has been viewed more than 1,000 times. In fact, Aga Khan University uses it to train teachers-to-be. “We hope it will snowball and to shared as a resource to support the transformation from traditional teaching into active education drawing on educators nature curiosity and creativity,” said Crichton.



Above, a simple counting tool using local vegetation