Our Changing Climate: Do we need a shift in the way we learn?

19 November 2019

ZENA DAYSH LECTURE
Commonwealth Human Ecology Council, London, UK

Professor Asha Kanwar
President & CEO, Commonwealth of Learning (COL)

Co-author: Alexis Carr
Research Coordinator, Commonwealth of Learning (COL)

Distinguished Guests, ladies and gentlemen. It's an honour to be invited to deliver the annual Zena Daysh lecture and I must thank Kabir Shaikh and the organisers for the kind invitation. My topic today is 'Our Changing Climate: do we need a shift in the way we learn?' which I have prepared with my colleague Alexis Carr.

Dr Zena Daysh was a visionary leader and thinker way ahead of her time. She developed the philosophy of human ecology during the Second World War, which subsequently led to the foundation of the Commonwealth Human Ecology Council (1969) and drew attention to environmental issues at a time when climate change was still not a major issue.

In her advocacy of human ecology, Dr Daysh highlighted the interdependence of humans with their natural, social and built environments.

This sense of interconnected ness links us back to traditional and indigenous worldviews. And can be summed up in the word of Chief Dan George, 'Have I done enough to keep the air fresh? Have I cared enough about the water? Have I left the eagle to soar in freedom? Have I done everything I could to earn my grandchild's fondness?'

Zena's ideas also looked forward to the Brundtland Commission's definition of sustainable development: 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.

Dr Daysh supported several Commonwealth initiatives—from transformational community-based activities for marginalized women in Sierra Leone, to post-tsunami reconstruction efforts in Sri Lanka. She worked at the grassroots, combining principles of social inclusion and environmental conservation for sustainable development, an approach that is at the heart of our work at the Commonwealth of Learning.

As you know, COL was established by Commonwealth Heads of Government when they met in Vancouver for CHOGM in 1987. Ever since, we have been in beautiful British Columbia, which makes us the only Commonwealth intergovernmental organisation not in London.

Our mission is to help Commonwealth member states and institutions to use technologies for expanding access to education and training.

COL believes that learning is the key to sustainable development. Learning must lead to opportunities for economic growth, social inclusion and environmental conservation which links us to the work of the CHEC.

Zena would have been proud to celebrate the 50th birthday of the organization she founded and one that has worked tirelessly to 'create lasting improvements for local communities across the Commonwealth' something so dear to Zena's heart. Warm congratulations to Levi Oguike, Mark Robinson and all colleagues at CHEC on this landmark occasion.

In my presentation, I will first look at the impact of climate change on education in the Commonwealth. I will then explore whether achieving SDG 4 will help to mitigate the climate crisis and share examples of some examples of 'green' models and approaches being adopted.

I will then highlight some of the contributions that COL is making to environmental conservation. Finally, I will suggest that we do need a paradigm shift in the way we approach education if we are to address the climate crisis.

The climate crisis is one of the defining issues of our times. Especially for the Commonwealth, with its 31 small states disproportionately affected by climate change. According to the 2016 World Risk Report (WRR 2016), 9 out of the top 20 countries most at risk for natural disasters are Commonwealth countries.

Seychelles is one of the countries currently facing an existential threat because of rising sea levels, land erosion and the degradation of oceans. You can see HE Danny Faure, the President of the Republic of Seychelles drawing world attention to this crisis from a submarine at the bottom of the ocean.

As temperatures continue to rise, so will the number of natural disasters. Studies show that heat waves are becoming more common as global temperatures warm due to human activities. The global hot weather record was broken in 2016 but this summer in Europe broke all previous records. Over the past 40 years, the number of climate-related disasters globally has tripled, a trend that is expected to continue.

How does the climate crisis effect the education sector? According to UNICEF, more than 3000 classrooms and over 330,000 students were affected when Cyclone Idai, hit eastern Mozambique in March this year. In September Hurricane Dorian destroyed 90% of the infrastructure in The Bahamas. The week after Hurricane Dorian hit was to be the first week of school and many families had paid school fees and purchased uniforms, which were lost and many schools were deemed to be unsafe for students.

As we have seen, climate-related natural disasters have major, detrimental impacts on education. Entire schools can be destroyed or irreparably damaged, leading to thousands of displaced students, unable to continue their education. Critical data and student records may be wiped out entirely, leading to the collapse of entire systems.

And as Lord David Puttnam cautioned at the recent Pan Commonwealth Forum held in Edinburgh: "The time for action is now—the world is likely to be in a significantly worse state …and the most vulnerable will only have become more vulnerable".

Clearly the climate crisis will continue to negatively and disproportionately affect education systems. But what is the impact of education on the climate crisis? Will achieving SDG4 help to mitigate the climate crisis?

SDG4 aims to ensure inclusive and equitable quality education and lifelong learning for all by 2030. Yet, to achieve the targets of SDG4 entails higher investments in infrastructure, higher consumption and rural-urban migration, all of which potentially have detrimental effects on the environment.

We still have a long way to go to achieve the targets. While we have come close to achieving Universal Primary Education, it will require a great deal of effort to reaching universality in lower and upper secondary education. When it comes to tertiary education the current enrolment rates at 38%, show how much more needs to be done to achieve universal tertiary education for all. The situation is far worse in many Commonwealth countries where tertiary enrolment rates are below 10%.

While a great deal of progress has been made in the school sector, we still see 262 million youth and children out of school. How many new schools would be required to accommodate these learners, under the existing paradigm? What would be the carbon footprint of these schools? While global data is not available, we can get a sense of the magnitude of the potential impact by looking at the requirements here in the UK: More than 2,000 new schools must be built within the next four years alone to accommodate the rising number of primary and secondary pupils in England alone. And the environmental footprint of UK schools currently stands at 9.4m tonnes of greenhouse gases every year.

In China, approximately 40% of the energy consumption in the public sector comes from higher education alone. If we were to move from the current global enrolment rate of 38% to 100%, how much higher would the energy consumption be?

The globalisation of education, particularly higher education, also leads to increasing carbon emissions from student travel. Currently, an estimated 14 megatons of CO2 per year are associated with student mobility, a number that is likely to increase within the current paradigm, in which campus based learning is the dominant mode.

Besides direct contributions to emissions, education may also indirectly have a negative impact. Komatsu and Rappleye (2018) observed that countries having “better” education tended to have more detrimental impacts on climate change. While education can lead to economic

development, which has many positive impacts, we must remember that economic development tends to be associated with higher rates of construction, consumption, and energy use.

Besides the environmental impact of these emissions, there is also an associated economic cost. Researchers from Stanford University estimate that the economic damage of carbon dioxide emissions is roughly $220 per ton. Using this figure, in one year, in the UK alone, schools would generate more than 2 billion dollars worth of associated economic costs from their carbon emissions.

The education sector, from primary to tertiary, contributes to both direct and indirect emissions, with an impact on environmental degradation and associated economic costs. If we look strictly at contributions to emissions, the achievement of SDG4, under the current paradigm, could potentially worsen the climate crisis.

However, while the education sector contributes to carbon emissions it also contributes to sustainable development and underpins the achievement of the other 16 SDGs.

And as we know, Education reduces poverty. 171 million people could be lifted out of extreme poverty if all children left school with basic reading skills. Increases in educational attainment precede improvements in health status (UN, 2003, p. 87). The education of girls and women can lead to gender equality. In Kerala, women's education reduced the fertility rates to 1.7. which is lower than the rates of 1.9 in China. (Sen, 199)

How can we mitigate the negative effects and leverage the power of education to make a difference in terms of environmental sustainability?

One possible solution is suggested in this quote "On any given day, more than a billion children are enrolled in primary or secondary schools. Imagine if these children could understand the main causes and consequences of climate change and what they, their families and communities can do to be better prepared for climate change and embrace a low carbon lifestyle. Today's children are tomorrow's business leaders, decision makers and consumers. Therefore education plays a key role in responding to climate change."

What are some of the models and approaches that attempt to address environmental sustainability through education?

We are all aware of UNESCO's Decade of Education for Sustainable Development (ESD), a holistic and transformational approach to education that addresses learning content and outcomes, pedagogy and the learning environment. The intervention succeeded in increased visibility in national policies and international agreements but was not fully integrated into education systems in most countries.

Another interesting model is the EARTH University in Costa Rica, a carbon neutral campus, which prepares young people to contribute to sustainable development by an interesting combination of theory and practice—students work in the fields in the morning and attend classes in the afternoon. This 'whole-school' model addresses not only the content of the programmes, but also the organisational culture and physical infrastructure.

Elementary schools in the "Green School Alliance" in the USA are using a similar 'whole school sustainability approach' to integrate sustainability in the curriculum, culture and infrastructure of the school.

Similarly, in the skills sector recognizes the need to develop a “transition ready workforce” for careers in environmental sustainability. The green skills required relate to clean technologies and soft skills required to adapt to the changing world of work. In Western Canada, where the fossil fuel industry is one of the region's major sources of employment, there has been a push to develop policies and plans to re-skill or 'upskill' workers in emerging green technologies.

In Japan, there are numerous efforts to link students to the community and the environment through their daily experiences and interactions. One of the best examples of this approach is the school lunch programme when students are taught about where their food comes from and have a chance to speak directly to the farmers to learn more about the process.

Outdoor education is an experiential approach to schooling where learning is anchored in the local natural environment. Many schools including the Kootney Boundary School district in British Columbia, are implementing outdoor education programmes, and have developed resources of curricular ideas and materials for outdoor, environmental and place-based learning.

These examples highlight some of the innovations to address the issue of environmental sustainability through education, but these mostly exist in small pockets and often do not achieve scale. Can technology be the answer for achieving scale?

Let me share some examples of COL’s approach to environmental sustainability which leverage appropriate technologies.

COL’s work promotes the four R’s: reduction in carbon emissions; raising awareness on disaster preparedness; reskilling for a greener future and resilience for the education sector.

As we have seen, the brick and mortar education sector does have a growing carbon footprint. Can open and distance learning reduce learner-generated emissions?

Perhaps the most comprehensive project assessing the environmental impacts of different modes of delivery in higher education is the SusTEACH project, supported by the Open University, UK. The findings showed that online and blended ICT-enhanced distance teaching models had significantly lower environmental impacts than face-to-face teaching modes (Caird et al. 2013; Caird et al. 2015). COL conducted a similar study in Botswana, which found that the average carbon footprint of the face-to-face group is nearly three times greater than that of the distance learning group. Within the overall carbon footprint, emissions from travel were by far the greatest contributor to this disparity. This suggests that ODL or blended modes can decrease emissions by reducing face-to-face contact hours.

COL promotes open and distance learning at all levels, from open schooling at the secondary level, to open universities at the tertiary level, to non-formal skills development programmes such as lifelong learning for farmers. Through its advocacy efforts, COL helps to increase the use of ODL, which has been shown to reduce carbon emissions generated by teaching and learning.

Technology can also be used for awareness raising campaigns about climate change and disaster preparedness

Working with the Blue Economy Institute in Seychelles, COL supported the development of an online course in this emerging field, which was offered free by the University of Seychelles.

Following the devastation of Hurricane Maria in Dominica last September, the Ministry of Education and Human Resource Development in partnership with COL has embarked on a public education project to create locally-produced audio and video clips to educate citizens about climate change and empower them to mitigate the risks and be better prepared for future disasters.

To address the climate crisis there will be a need to move toward more sustainable practices, and environmentally friendly business. How can we skill and reskill at scale?

COL has established a Virtual University for Small States of the Commonwealth (VUSSC) and all 31 small states of the Commonwealth are active members of this consortium. They have collaboratively developed several programmes such as the diploma in sustainable tourism, disaster preparedness etc to address specific needs. Leafaitulagi Vaaelua is one of the graduates of the VUSSC diploma in sustainable agriculture from the National University of Samoa and is in full-time employment in her own country.

COL in collaboration with The Open University of Mauritius has developed a MOOC on Introduction to Sustainable Development in Business. The free online course is being run for the second time, with participants from across the Commonwealth.

As we saw earlier, the impact of climate-related disasters on the education sector can be catastrophic. COL supports ministries of education in countries that have been affected by natural disasters to continue or resume classes, even when infrastructure has been damaged.

COL's innovation, Aptus, allows educators and learners to connect to digital learning platforms and content without the need for grid electricity or Internet access and requires only battery power, which can be recharged via grid power or solar charger, as needed. COL deployed Aptus devices and tablet computers in Tonga in 2018, following Cyclone Gita. A similar project is now under way for The Bahamas.

COL is also supporting resilience of the education sector by training teachers in environmental education. COL supported the National Teachers Institute, Nigeria, to develop a Green Teacher programme to help teachers to integrate environmental concerns into the classroom from a very early stage. This is now being offered online to teachers in the country.

COL leverages the power of technologies to develop policies, build capacity and create materials that can be shared freely by stakeholders around the Commonwealth. Because of the digital divides and the uneven development of technology across the Commonwealth, COL believes that technology must be placed in an appropriate social, cultural and political context.

While there are several interesting models and approaches to integrating environmental concerns into education, sustainability can easily become a curricular 'add on'. What kind of shifts do we need to see a change in values, and the behavioural changes needed to address the climate crisis?

Let me suggest three shifts that can promote the interconnectedness of the people and the planet: one, the adoption of a transformative approach to learning or learning to make a difference; two, tapping into the vast potential of tacit and indigenous knowledge; three, situating learning closer to our communities.

A successful outcome of education today is the acquisition of skills and competencies. A transformative approach would go beyond that to empowering individuals not just to be prepared for change but to also shape the course of that change. There is a great deal of emphasis on education leading to employment or entrepreneurship. The transformative approach would integrate the values of environmental conservation and global citizenship. Finally, the dominant educational paradigm values achievement rather than accomplishment. Marc Prensky explains the difference—achievement benefits only the individual and her personal goals while accomplishment goes beyond individual achievement and benefits others and society leading to transformation.

One example of accomplishment comes from High Tech High in San Diego California, which supported students to learn to use complex water-monitoring equipment when the government cut funding for trained water monitors. The students not only continued the extremely valuable practice of monitoring the water, but also published the data online to share with their entire community.

The second important shift would be to integrate tacit and indigenous knowledge which has a great deal to offer in environmental management. According to Canadian environmentalist David Suzuki, "it was the people who stayed in place as others moved on, who had to learn to live within their means, or they died. That is what I believe is the basis of indigenous knowledge that has built up over millennia and that will never be duplicated by science because it is acquired from a profoundly different basis."

But much of indigenous and traditional knowledge, particularly in the developing world, remains tacit. Although we often think of knowledge as what is written down, it is estimated that only 20% of what we know is in fact codified. The remaining 80% is tacit –acquired through lived experiences and is intuitive. This tacit knowledge can be easily lost if not preserved and technologies provide a means of capturing this rich resource for future generations, as never before.

Here is an example is how local, tacit knowledge is captured and shared in COL's Lifelong Learning for Farmers programme where the community is not a mere consumer of information but a partner in knowledge management and dissemination. Learning materials are developed at the local level with the participating community playing a major role. The process of developing, using, reusing learning materials is highly dynamic. Using Facebook, the farmers codify and share age-old best practices for sustainable agriculture amongst thousands of members, which would otherwise not have been possible through conventional means.

Studies have shown that countries where individualist orientations are stronger tended to have higher per capita CO2 emissions. Adger et al. (2013) and Chuang et al. (2016) reported that people having 'interdependent selves' were more likely to engage in pro-environmental behaviors than 'independent selves'. By linking learners to their communities, we can build this sense of interdependence. Community-based learning gives meaning, relevance and context to learning, and helps to inculcate a greater sense of responsibility. This is possible through the use of technologies.

Here is a photo of the barefoot wireless engineer training in India that takes place in the community. Another example is the E-Apprenticeship programme in Manitoba where learners work with an employer in their own community and simultaneously complete six months' of part-time online study.

The examples show how the three shifts can be implemented and how technology can play a role in facilitating such a shift. COL's experience shows that by leveraging technology for learning we can one, reach larger numbers at speed, scale and lower costs; two, increase access especially to the most marginalized, remote and rural communities; three, enhance sharing, cooperation and collaboration and four, reduce carbon emissions.

These approaches have existed for centuries outside the western world and promoted by some of the greatest thinkers of our times. Gandhi's concept of Nai Taleem was an approach to education that emphasised its purpose and practical role in society. For Gandhi, education had to address the needs of society as a whole, with tangible positive impacts on the world: "True education must correspond to the surrounding circumstances or it is not a healthy growth". I'm sure Dr Zena Daysh would have agreed.

With that, let me thank you for your kind attention.