Innovation
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Editorial

We hear it said all the time; innovation and technology is changing everything. If you were to reflect on the past ten years, what innovation would you say has had the biggest impact on our society?

Innovation can be as large or small as we wish. It can be the way to fine-tune farming operations, or it can be as challenging as inventing a driverless car. With all innovation, however, comes responsibility, for innovation should contribute positively to society, the environment and the world as a whole.

Often innovation comes from improving an existing product or design. As it is not necessarily a new invention, innovation can be achieved through problem solving. The basis of effective problem solving is the ability to think creatively and laterally. Creative thinking can be enhanced in a school environment through face to face communication and brainstorming, where innovative ideas can shift to the next level.

In this edition of Taiho’s Quarterly, we examine how students are encouraged to think creatively and laterally to solve problems. From aquaponics on Traidhos Farm to creating power using a home-built Biogas Unit, students at Prem learn that problem solving leads to innovation. The time-old Lego building block is explored as a tool for teaching imagination, decision making and creative thinking. Articles also examine how new drone technology aids agriculture; how makerspaces in libraries challenge creative thinking; and how robotics create new opportunities to grow human interaction.

Learning to problem solve through creative and lateral thinking will enable future generations to contribute positively to a more sustainable future.

Editor

The Three-Generation Community is a unique educational centre. It offers Prem Tinsulanonda International School (an IB World day and boarding school), a dynamic Visiting Schools Program, the exciting Traidhos Camps, an artists’ residency program, an educational farm and a converted rice barge used for educational environmental studies on the Chao Phraya River in and around Bangkok.

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http://camps.threegeneration.org
A great opportunity for young people to have fun and to develop confidence and interests in a safe environment during school breaks

Traidhos Camp 2018

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“Happy new year, happy new year,” the CD plays its well-known melodies and a pretty “January” calendar picture of a beach scene in southern Thailand records the passing into another year, 2018. There is time for reflection on the year just travelled but time too to think about the year to come. The happy memories recalled already have their place alongside others pictured on the windowsill. Any regrets are filed away as part of life’s experiences, while clichéd New Year’s resolutions have been made. It is a scene repeated in households globally.

What did you promise yourself? Less chocolate? More exercise? Time to study something new? Whatever our feelings about the hype of New Year, the chance to make a new start is always powerful. But think about your resolutions - how many of them are really new or are they merely recycled good ideas, new again for this year?

Innovations are often like that. Good ideas recycled from generation to generation. The fashion industry is expert at this. Those dated platform shoes, or that sequined top; the fake fur collars and cuffs, re-fashioned and re-launched into this season’s must-have items. Look carefully in the high street and you should not be surprised to find so many of the latest accessories having their roots in your grandmother’s wardrobe.

The CD plays on through its medley of seasonal favourites, “The old is past. There’s a new beginning.”

2017 has had its fair share of innovations from the crazy to the practical. Everything from the frivolous to things that have the potential to really help individuals or the wider society. The fidget spinner craze, which promised hours of addictive fun, swept classrooms and playgrounds amusing kids around the world. Hi-Tech glasses that allow people registered blind to “see” were trialled, giving new independence and access to the world that sighted people take for granted; and developments in electric car technology brought the concept of clean fuel transport and perhaps a less polluted planet, one step closer.

But it is not just our New Year resolutions and fashion items that are periodically re-launched, good ideas in local wisdom or folk wisdom, also come around and are remembered and reintroduced as new innovations. From time to time, Traidhos Barge Program and Traidhos Camps, work in the community with local groups to construct check dams. These small barriers, often made from local materials and managed by the immediate communities help to conserve rainfall, allowing for more crops to be produced or for a richer forest to exist. They are a simple technology with their roots in centuries-old folk wisdom, having been used by both Roman and Aztec civilizations to conserve water, prevent erosion and allow land to be farmed on a ready supply of accumulated sands and silts deposited by rivers.

As we move into a new calendar year, Lynda Rolph, Head of Programs at Traidhos, reflects on how new technology can stem from ancient wisdom and how innovation is a process of evolution.
Recently, barge staff joined students from a local school in Kanchanaburi Province to construct a small forest dam. During the project, students collected and arranged rocks to create a barrier and while doing this, they saw, many for the first time, the small forest plants and creatures in this local habitat.

As well as the environmental impacts, the project benefitted the community by bringing them together and allowed the young people to get in touch with their local forest. The program was supported with activities to help students appreciate the value of trees within a watershed, especially their role in fixing soils that would otherwise be transported by streams. Today check dams are used across SE Asia to maintain or bring back the natural fertility of the land. How many other good ideas could be re-introduced to benefit communities with little or no major expense?

The CD draws to a close
"It's a new dawn
It's a new day

It's a new life
For me
And I'm feeling good"

What advances will 2018 unfold? It promises to be a year of developments in space technology, of medical innovation, of a recycling revolution (an old new perhaps – drinking coffee from a ceramic mug instead of a disposable cup?) along with many other things. Are you feeling good? Happy New Year!

**Lynda Rolph** is Head of Programs at Traidhos ThreeGeneration Community for Learning and has been with the company for over fifteen years. She is a highly respected environmental educator with teaching experience in United Kingdom and Thailand. She is a former director of the Barge Program.

**Photos: Google Images**
There’s no doubt that students today live in a world very different from previous generations. The answers for how to navigate issues like climate change, artificial intelligence, and internet security won’t be found in a textbook, lecture, or exam; they’ll be birthed from far-reaching and courageous imaginations, from unexpected dreamers and radical minds. In other words, tomorrow’s changemakers are today’s creative thinkers.

Students in many Western countries are herded through curriculums that favour hard subjects to the detriment of so-called soft subjects — an emphasis seen as necessary to compete on an international level. Schools in eastern countries like China and Hong Kong are notorious for pushing high test scores in STEM subjects (science, technology, engineering, and math). But these achievements usually rely on rote memorization and immense time spent studying to the exclusion of all else. It’s relatively straightforward for schools to churn out winning numbers when the main skill they’re evaluating is a student’s ability to regurgitate information. In this equation for academic success, critical thinking and creative problem-solving often get left in the dust, unhoned.

So while young people may find themselves excelling in the confines of school, what about life beyond the classroom? How mentally and emotionally equipped are these students to adapt to the world’s shapeshifting present, and to create lasting change in its future?

It could be argued that ignoring the arts for STEM subjects and encouraging follow-the-leader behaviour did a reasonable job at preparing students for the “real world” in the past. Not too long ago most folks were still wedded to the single-career employment model: work at a company for thirty or forty years, then retire at age sixty-five with a pension. Doing what you were told without rocking the boat was a useful skill for this kind of path.

Fast forward: between the internet and globalisation, that old-school employment model is growing more obsolete by the day. With the ongoing rise of self-employment, having an entrepreneurial spirit and leadership sensibility is paramount with people currently averaging between twelve to fifteen jobs during their lifetime. It’s expected that by 2020 nearly half the workforce in the UK will be self-employed. No

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wonder the UK’s creative economy is emerging as one of the fastest growing in the country — it’s being driven by this new wave of risk-takers.

Being entrepreneurial is nothing new to artists. They are, after all, in business for themselves. With their finger always on the pulse of the cultural climate, sensing its natural ebb and flow, these creative practitioners must constantly retool their product, marketing techniques, and overall business model. But despite their multitasking prowess, many artists aren’t able to earn a sustainable living from their artwork alone. Instead, they seek alternative means of income still related to their creative practice.

Over time, we’ve gone from artist-as-brooding-genius to artist-as-Jill-of-all-trades. The artist’s ability to adapt to an ever-changing industry is just as important as the brush marks they make on canvas. Today’s creative practitioners aren’t just makers but polymaths through and through: they’re entrepreneurs, social media masters, teachers, content creators, small business owners, tech gurus, curators, gallerists, sales people, accountants, connectors, and — oh yeah — trained artists.

So, what’s the connection between these polymath creative practitioners and our aforementioned creatively-challenged students? Well, our students need to enhance their creative skill-sets if they are to make their own way in today’s brave new world, and artists have the power to help them do just that. What remains is figuring out the details. How do we incorporate an artist’s wisdom into a regular school that follows a mainstream curriculum?

Bringing creative practitioners into the fold of everyday classroom experiences is one possible answer to this riddle. Situated amid the iconic rolling hills of northern Thailand in Mae Rim district, Prem Tinsulanonda International School offers a unique programme called Artist Residency Thailand (ART). It brings together working artists and young students to enhance creative thinking and overall engagement in hard and soft subjects alike.

Imagine watching the acclaimed British actor Milto Yerolemou — of Game of Thrones fame — step up to the front of an English class and recite Romeo & Juliet to a group of wide-eyed grade-school kids sitting on the edge of their wooden desk chairs. Students who couldn’t care less about iambic pentameter the day before now suddenly find themselves deeply interested in what this Shakespeare fellow has to say.

Launched just four years ago, the premise of ART is simple: invite an international or local creative practitioner to stay at a school anywhere from 10 days to a month. The artist may be from any field or genre: music, graffiti art, filmmaking, dancing, acting, writing, painting, and so on. During the residency, the artist spends 60% of his or her time on their personal artistic practice, and the rest delivering creative workshops to the students. ART programme director Alex Soulsby provides one-on-one mentoring to the artists-in-residence, helping ensure that they learn how best to deliver these workshops to the school’s young students. In addition to this mentoring and professional support, the programme offers each creative practitioner studio space, meals, and accommodation.

One of the major benefits of the programme is how it integrates with a pre-existing curriculum, rather than being awkwardly tacked on or targeting only art students. (Many art residencies that work with schools exist more or less separately from the curriculum’s core learning objectives.) In contrast, ART uses the arts to involve young people in a wide-range of classes central to the curriculum. For example, a professional ceramicist from another country...
might join forces with the school’s chemistry department to show the class how to sculpt different molecules from clay. The tactile workshop could be part of a chemistry lesson on the periodic table that also helps students improve their fine motor skills.

Giving young people creative agency in this way lets them reach their higher potential. Having an international artist in the classroom — someone they can relate to — engages them in course material outside their usual relationship with schoolwork. And this, in turn, encourages students to learn more about that subject on their own time — and on their own terms. These students are able to think for themselves, problem-solve in unique ways, and ultimately offer valuable contributions to the world. As Alex Soulsby suggests, “the interaction with these creative practitioners helps create an organic interest in each student’s own learning beyond what a regular teacher can do and inspire.”

How this works in practice is a real treat to see. A range of eclectic artists has already walked through Prem’s classrooms, sparking genuine curiosity and leaving a lasting impression on the young students. To teach them about water conservation, for example, writer and US Presidential Advisor Paula DiPerna led an experiment that demonstrated the practical impacts of water waste in Thailand and countries elsewhere. Meanwhile, UK-based musician Chris T-T passed on his own passion for punk rock to the students during his stay. He introduced them to punk philosophy and facilitated a song writing workshop inspired by the influential movement.

Jane Bryant, meanwhile, is on the other side of the education equation as the CEO of Artswork, a UK-based organisation that integrates the arts into the community through its collaborations with the cultural sector and local youth. She offers her insight on ART’s potential as a model for the future:

“"This extraordinary international programme offers creative practitioners — at different stages in their careers — an incredible opportunity to immerse themselves in developing and enhancing their own innovative and creative practice. What undoubtedly enriches this is the unique community context and the associated development of practitioners’ workshop and education leadership skills as part of a completely integrated approach. In my experience, this programme acts as an international model, uniquely drawing from the inspirational inter-relationships between innovative creative practice and education and community development."

Our time spent at school inevitably impacts our relationship with the world and each other for the rest of our lives. Engaging young people on their own terms gives students greater ownership over their own learning. And when students feel a sense of true agency, the real magic can begin. As the world continues to evolve, so too must our education models — and we’d do well to move forward with approaches that embed creative learning directly into the system. The time has come when our younger generations must not only re-imagine but re-create our world for the better.

While ART is currently based solely in Thailand, it acts as an international model for schools everywhere. Replicating the programme is surprisingly achievable: a school must have space to house the artist to live and work creatively; a willingness among staff to embrace new teaching approaches; and a professional to liaise between them who intimately understands both the art and education sectors. There’s excellent reason why nearly all reputable cultural institutions like theatres, museums, and galleries have a department or person to connect arts and education. It only makes sense that our schools follow their lead and forge a link between creative development inside and outside the classroom. We need look no further than Sir Ken Robinson for confirmation on this belief. He wisely reminds us: “Creativity is putting your imagination to work, and it’s produced the most extraordinary results in human culture.”

This article by Kimberly Lauren Bryant, was first published in the International School’s Journal, Petersfield Vol. 37, Issue 1 (Nov 2017), page 53-57. The above is an abridged version. The full text is available at https://search.proquest.com.

Photos: Prem Artist in Residence Programme.
At the Traidhos Three-Generation Farm, we take pride in being able to demonstrate and showcase a wide variety of traditional and organic farming techniques to our visitors and students. The newest element added to our farm is a solar powered aquaponics system that was installed in November 2017.

Aquaponics is an integrated farming technique, combining the practices of raising fish and growing crops. However, this is not a new idea, with the earliest examples dating back to the Aztec civilization in Central Mexico, and raising fish in rice paddies in South China and South East Asia. The contemporary idea of aquaponics began to develop during the 1970s, with recirculating systems being used around the world. The past fifty years have seen significant and rapid advances in the technology that has allowed aquaponics to become a large scale, financially viable option for farmers.

The basic premise of aquaponics is to combine two separate farming practices. The first is hydroculture, or raising animals in water. The second is hydroponics; growing plants in water without soil. In the fish tank, the waste from the fish is collected, which would eventually become toxic for the fish without some form of filtration or cleaning. This natural waste can be used as a natural fertiliser for vegetables. The water from the fish tank is pumped through the root zone of the plants, where the organic waste can be absorbed as a fertiliser, before returning the water to the fish tank. This closed system is a self-contained way to combine raising fish and growing plants in a small area.

Solar powered aquaponics on Traidhos Farm

The ancient art of aquaponics has reached a new level, as Head of Farm Education, Scott Burfiend explains, with the help of solar energy.

On the farm

In the past, we have experimented with small scale hydroponic systems, growing eight plants at a time. However, our new project allows us to grow over one hundred and thirty plants and raise five hundred fish, with flexibility to expand and increase our plant production in the future.

Already we have had students learning from this project and exploring how plants can be grown without soil. In an aquaponics system, you combine raising fish with growing plants. The fish tank is home to some delicious aquatic animals, but as you feed them they begin to poop. Aquaponics finds a fantastic way to reuse this poop and clean the water. Our aquaponics system is currently growing lettuce and tomatoes, which will be appearing in the school cafeteria alongside our fish next year.
But it is not just our students who have been learning from this. A recent International Baccalaureate (IB) teacher training workshop welcomed Biology and Environmental Systems and Societies (ESS) teachers from around the world who were fascinated by the learning opportunities aquaponics offers. Not every school is lucky enough to have access to a farm on site, so many of the staff were keen to take the idea back to their schools and set up similar projects in the classroom, allowing their students the chance to experiment with different growing systems.

Solar energy

Aquaponics requires the use of power to drive the flow of water from the fish tank to the grow beds. Without a power source, the fish tank would remain stagnant and become more polluted every day. The pump in an aquaponics system allows the water to circulate and be filtered by the plants. By using solar energy to power our system we are able to develop new and exciting learning opportunities for our students who are studying electricity and sustainable energy. Our Grade 2 students will be the first to explore this concept in January 2018 when they continue their unit of inquiry into energy.

We hope to continue developing this technology on the farm and find innovative ways to utilise the grow beds we have. We also want to expand on the solar project and potentially have all electricity on the farm from sustainable sources.

Scott Burfiend, Head of Farm Education, Traidhos Three-Generation Farm was born in England and holds a degree in Natural Sciences from the University of Bath. He has worked extensively in outdoor education in the UK and UAE. Scott also spent time in Barbados as a research assistant studying hawksbill turtles. He loves to be outside and sharing his passion for ecology with students.

Photos: supplied by Prem and Scott Burfiend.
Building a Home Biogas Unit

The use of innovative design can transform organic waste into clean energy for the benefit of the Prem community.

Innovative projects in recycling

Grade 8 Product Design students have been designing and making recycle systems in the interest of improving waste management within the immediate local Prem community. There are minimal restrictions on what students can design. Where possible, we want the students to try different things and to take risks. Some students have worked in groups, whilst some have worked individually. Students investigated problems associated with recycling by researching existing operating systems at Prem. They then asked parents, students and teachers how they think the recycle system could be improved. One student, Vandra (Witty) Mejudhon, came up with a very good idea. In the essay below, Vandra explains her exploration into biogas and her innovative solution.

Clean energy

A biogas system generates clean energy without any electricity and also allows you to properly treat your household waste. The system produces up to two hours of cooking gas every day solely from your food scraps or animal waste.

Biogas is a household system which converts organic food leftovers and animal manure into gas that can be used as an energy source for cooking, as well as producing natural, liquid fertilizer for the garden. Before home biogas was invented, people generally used fossil fuels. According to a report by the Organisation for Economic Co-operation and Development (OECD) published in 2015, fossil fuels account for eighty per cent of carbon dioxide (CO2) air pollutants and sixty-seven per cent of greenhouse gas emissions. Biogas is a sustainable energy source, as research shows that fossil fuels are associated with global warming.

My idea

After much investigation, designing and customer feedback, I have made a Home Biogas Unit for Prem, so that we don’t waste left-over food. A biogas unit can be any size, from a medium size trash can, to a huge bin, which will provide for a large family.

Making a biogas unit at school would enable us to reuse organic waste into something that we need every day - energy. It’s great that Prem has an on-site farm where current food waste is recycled, however, I can imagine...
that it would be better to use the food that some students can’t finish to generate the biogas, thus we could create more energy for use in the cafeteria kitchen and produce fertilizer for our plants.

To use the biogas, you would put the organic waste (manure and water) into the barrel. To pour the waste matter in the barrel, there would be a pipe from the top (refer to photo of a blue pipe with a black cap over it). It would take a few weeks for the gas to be produced. After the organic waste decomposes, the gas would flow through the hose, which then would go into the gas tank. There would be some organic waste remaining, which can be used as fertilizer. The fertilizer would come out from the back of the biogas unit where there would be a set of T-shaped blue pipes. The tank, for which I am using a car tire during the prototype stage, acts like a storage space for the gas. When the energy is not needed, the biogas would be safely stored, although when it is time to use it, you could turn on the tap and let it flow to the cleansing barrel. The cleansing barrel would contain water so that it would be able to purify the gas. From the cleansing barrel, there would be another hose which would lead the gas to the stove. The unit could produce two to three hours of cooking gas each day, which is the perfect amount for three meals a day.

Up to six litres of food waste, or up to eighteen litres (19.02 US liquid quarts) of animal manure, can be placed in the Home Biogas Unit each day. The unit can process all food, including meat, fish, oil and fats, as long as they are all organic and naturally made. Every litre of food waste produces about two hundred litres of gas, which is the amount needed to cook for one hour over a high flame. A Home Biogas Unit can produce enough energy to cook food. A full tank of biogas can fuel a one-blade barbecue grill for forty-five minutes, or a typical stove burner for about two hours.

The system of the home biogas can store up to five hundred litres of waste. The home biogas system is also continuous and would run 24/7; meaning you can put food in at any time, whether it is night, evening or morning. It also means that it would be storing all the organic waste and creating energy on an on-going basis.

The Home Biogas Unit is installed with a filter to eliminate unpleasant odours. The system itself is designed with a weighted sink cover, making a closed system. This means that odours are contained inside the system, and unlike composting, no pests will be attracted. This also means that you will not see a trail of any pests crawling upon your Home Biogas Unit, and that’s a positive outcome.

Introduction by Mark Bosworth, Prem Product Design Teacher. Case study by Vandra (Witty) Mejudhon, Grade 8, Prem Tinsulanonda International School.

Photos supplied by Prem
The Nature Channel

The Adventurous Journey program, as Daniel Worthington discovers, reconnects youth with nature-reality to balance the growing impact of technology on child development.

It's no surprise that technology has changed the world in so many ways, and faster than anyone could have imagined.

In a world where we can get a week's worth of groceries delivered to our doorstep without even leaving the comfort of the living room sofa, the need for us to step outside our home has never been so low. With more and more people spending less and less time out and about, sometimes it's good to remember exactly what planet Earth has gifted us.

Phone addiction

With a generation so fixated on their phones, computer games and air-conditioned shopping malls, the outside world often takes a backseat. The temperature isn't perfect, there are bugs and dirt to aggravate us, and Uber doesn't always show up to collect us, even if we've booked. When everyday problems like these seem overwhelming, technology becomes a substitute for reality. People often use technology as a welcome escape from normal everyday challenges in life.

More and more, life is revolving around technology, whether it's using machinery to farm, or taking an electric taxi to work where we sit in front of a computer screen for eight hours a day. As a result, outdoor activity has been pushed further and further back in conscious thinking.

Tune into nature

Now is the time for technology to become a tool that enables us to have more free time to spend outdoors. Think about how much time you spend on your smart device and switch this time to pursue healthy outdoor activity. Spend a day kayaking across a lake, go for a morning run around the neighbourhood, take the dog for a walk - the list goes on.

Some of younger generation may find the transition to outdoors difficult, as often they have grown up with Saturday morning cartoons or PlayStation. While these activities provide their fair share of entertainment, and if done right, quality experience, it's creating a sedentary generation which can lead to health risks later in life. The sudden "go and play outside" comments can leave children wondering what to do with this green plant-like substance beneath their feet, or the big yellow ball in the sky.
Combatting the problem

Getting children outdoors is where youth-based programs like the International Award come into play.

The award program encourages young people to get out of their comfort zone and challenge their own boundaries. A big part of this challenge is the Adventurous Journeys expeditions and explorations program that require participants to be outside and actively moving to achieve predetermined goals.

It’s quite common at the lower school-grade level, for the chosen Adventurous Journey to be an extensive trek through unfamiliar terrain. In this activity, students are required to work in small teams to navigate their way from the beginning to the end of their outdoor course. Adventure trips such as these, see students pushing themselves both physically and mentally to succeed in reaching the end goal. Students may, at first, see these activities as a novelty experience, but the journey itself is beneficial to each individual in so many ways. The most important outcome of all is that students reconnect with the outside world in a deep and meaningful way; one that they have often never experienced before.

The Adventurous Journey program enables students to become part of the landscape in which they are participating. The journey becomes an experience of reality, often with stunning scenery, that no photo or video could ever do justice. Human senses are developed from sight, to sound and feeling. The physical endurance part of the journey reminds students that the human body is capable of a lot more than they think possible.

The great outdoors is more than just weekend entertainment. It’s a reality with only one pre-set channel. It’s on the other side of the office window; it’s on the other side of the front door at home.

It doesn’t matter when you get a chance to experience outdoors, or for how long you are out there, but it’s always good to take a step back from indoor life and replenish your body with vitamin D from the sun.

Outdoor time is a must for longevity and it’s not technology driven. Select an activity that suites your circumstance, whether it’s a new hobby like hiking through mountains, or just finding the time to get out during your regular daily schedule. Try cycling to work or walking to the café around the corner instead of drinking coffee in the office. The great outdoors has always been there, we just need to re-evaluate our connection to it.

Daniel Worthington is the Visiting Schools Program International Award Coordinator at Traidhos. The International Award is a global award. In the UK it is known as Duke of Edinburgh Award. More information: http://www.intaward.org/

Photos: Google Images and Pixabay
Who says libraries are dying?

With the expansion of digital media, the rise of e-books and massive budget cuts, the end of libraries has been predicted many times over.

And while it is true that library budgets have been slashed, causing cuts in operating hours and branch closures, libraries are not exactly dying. In fact, libraries are evolving.

As a researcher of youth learning in out-of-school spaces, I have studied the online information habits of youth. I am currently studying how librarians are supporting teen learning and teaching coding to novice learners.

So, how are libraries changing and what is their future?

Making a difference

Traditionally, libraries provided no-cost access to books and a quiet place to read.

But many of today’s public libraries are taking on newer roles. They are offering programs in technology, career and college readiness and also in innovation and entrepreneurship – all 21st-century skills, essential for success in today’s economy.

Libraries are evolving into spaces for innovation, and as Crystle Martin from the University of California discovers, today’s libraries are offering skill-building programs.

Look at some of the examples of this change happening across the nation.

In 2014, the San Diego Public Library Central Library opened the IDEA Lab, where students can explore and learn new technology with the support of their peers.

The lab hires teen interns to run workshops on a variety of topics of their interests. These range from Photoshop to stop-motion animation and skill-building technology projects.

These interns, coming from schools with predominantly African-American and Latino students, also get to work with a librarian to plan activities that give them experience related to their career goals.

Similarly, in early 2015, librarians at the Charlotte Mecklenburg Library in North Carolina created a “maker space” called Idea Box, a place where area youth are invited to learn to 3D model, 3D print, knit and code. This creates learning opportunities for the youth and develops their interests in STEAM (Science, Technology, Engineering, Arts, and Mathematics) careers.
In another such example, the Seattle Public Library started a partnership in 2014 with the Seattle Youth Employment Program. Together, they have designed curriculum to build digital and information literacy skills.

Alongside individual libraries, national organizations such as YALSA (Young Adult Library Services Association), who strengthen library services for teens, are already making changes to what they view as the purview of the library professional. Their recent report focuses on changing the role of library staff to support young people as they explore and develop career paths.

Libraries for the homeless

This is not all. Libraries are expanding beyond their traditional roles and reaching further into their communities.

Since spring 2014, the Brooklyn Public Library has been running "transitional services" that focus on providing programs such as "pop-up libraries" for people who are homeless, as well as opportunities for children to read books with parents who are incarcerated.

Even institutions going through budget cuts strive to maintain this component of serving the community. For example, when the Detroit Public Library had to deeply slash its budget during the economic downturn, alongside reducing its branch hours to 40 per week, it reworked its schedule to maximize the number of evening and weekend hours it was open, so as to best serve the community.

Future will be service

Libraries in the 21st century are going to be less about books and more about the services that library staff provide to their communities.

Miguel Figueroa of the Center for the Future of Libraries sums it up best, when he says:

The library of the future, whether the physical space or its digital resources, can be the place where you put things together, make something new, meet new people, and share what you and others bring to the table. It’s peer-to-peer, hands-on, community-based and creation-focused.

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Drones are taking to the skies above Africa to map land ownership

Mapping land boundaries is an important way to boost a country’s economic growth and development. It contributes towards better security of land ownership, allows land owners to get bank loans and helps governments to tax owners correctly.

Unfortunately, in most African countries only about 30 per cent of the land boundaries have been mapped. Mapping is done to capture the land’s boundaries with a view to registering ownership. Once mapping is completed, usually using techniques like Global Positioning Systems (GPS), authorities can issue a title deed or certificate of occupancy. This shows who holds rights to which pieces of land.

In Kenya during the 1960s photographs taken from airplanes were used to develop property maps. Kenyans were agitating for their land rights after the colonial British government had been unseated. The title deeds that were handed out as a result of those airplane photographs have formed the basis of Kenya’s property system for decades.

Today, aerial photographs from drones can be used for mapping property boundaries. In most parts of Africa, people demarcate their land using hedges. Ground land surveying techniques can be slow if the aim is to record all the parcels of land within a district or province.

But drones can be used to photograph hedges from the air. The maps developed from those photos are then linked to land ownership records to create formal land registers. This is an important way to record and keep track of land ownership in any given country.

I am involved in a project funded by the European Commission, its4land, that is testing the use of drones – or, as they’re properly called, unmanned aerial vehicles (UAVs) – for land mapping and registration. The research is being carried out in three African countries; Kenya, Rwanda and Ethiopia. Our hope is that if the research yields positive results, the project can be rolled out elsewhere on the continent. As far as we’re aware, this is among the first internationally to test the use of drones for land registration.

Putting the drones to work

Different types of UAVs can be used for mapping. The two main types are the fixed wing UAVs and the quad-copter UAVs. In general, the fixed wing drones look like a normal airplane with two wings.

We’re testing a fixed wing drone, DT18; it is produced by Delairtech, a French company. This type of drone is suitable for covering long distances – which is necessary when you’re mapping large areas’ property boundaries.

Two pilots per country were trained at Delairtech’s offices in Toulouse, France. I’m one of the Kenyan pilots; the other is a Master’s student also from my university. All of the
pilots were drawn from the partner universities in Africa. We’ve learned how to control the drone; how to develop a flight path; how to fly safely and how to process the data that’s collected.

Flight paths are set up using waypoints or digital markers. The drone follows these from start to finish. The DT18 can map a distance of up to 20km at a time. It can be redirected or recalled mid-flight if the pilot detects a risk. The drone is fitted with a camera, when takes pictures as directed by the pilot – who is following the flight on a laptop screen from the ground. The pictures are sent back to the laptop and stored on the drone’s own on board memory card.

No flying has happened yet: all the project teams are awaiting permission from the relevant authorities in their countries to send the drones skyward.

We have also brought residents into the project to get their support. In Kenya, our research is being carried out among the Maasai tribe in Kajiado county and among the Luo tribe in Kisumu county. We’ve visited a few sites in these counties and explained our research. These groups will receive feedback throughout the process.

Challenges and opportunities

Drones are not without their problems. They can be dangerous if flown without proper guidelines or permission, or by untrained people. Many countries in Africa have not passed any laws about the use of UAVs. Kenya is ahead in this regard; the civil aviation authority has developed and passed guidelines about drones.

No flying has happened yet: all the project teams are awaiting permission from the relevant authorities in their countries to send the drones skyward.

The process of obtaining permission to fly is very rigorous, which is important because drones can be a threat to normal airplanes and could even cause a collision. If this technology is rolled out for land mapping elsewhere in Africa, countries will need to first develop and adopt strict guidelines for flying.

Our hope is that this project will help countries across Africa to increase the number of land parcels that are mapped. It can also clarify the figures for different types of land ownership – private, public or community. This is an important driver for economic growth and development.

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Lego is not just a toy, as Sondra Bacharach from the Victoria University in New Zealand discovers, the bricks are designed as a universal tool to make anything we can imagine.

You may think Lego is just a kids’ toy – one you played with as a child and now step on as you walk through the house as a parent.

These days, however, the bricks are showing up in all sorts of unexpected places – on display in museums, in street art, in home renovations and at work. Those playing with Lego are unexpected too, including artists like Ai Weiwei, corporate business people facilitating a work function or engineers designing sophisticated robotics.

Our recent book, LEGO and Philosophy, offers a new perspective. These brightly coloured bricks are not mere child’s play. They raise important and challenging questions about creativity and play, conformity and autonomy, identity and culture.

Not just for kids

Interest in Lego has recently extended beyond simple child’s play. Sociologists, psychologists and economists have studied the use of Lego bricks as tools for achieving certain ends via Lego-based therapy and similar activities.

Tools are for using, building, working, thinking, teaching, imagining, playing and much else. In fact, tools can be for anything. As soon as we realise Lego is a tool, its uses beyond mere play are obvious. Indeed, it is a universal tool that can be used to make anything we can imagine.

The company Lego Group is well aware of the bricks’ role as a universal tool for the imagination: one of its most successful advertisement campaigns carried the minimal tagline “imagine”.

Lego is not just a toy, as Sondra Bacharach from the Victoria University in New Zealand discovers, the bricks are designed as a universal tool to make anything we can imagine.
Structured thought, brick by brick

This is also where we need to be more reflective, more critical and perhaps even wary of the largest toy company selling the primary tool for children’s minds. Do we really want a for-profit company, whose commercial and financial interests are front and centre, governing what our children think and directing how our children imagine? Here are some of the highlights from our book, and areas of improvement, for Lego in its role as a tool for thinking.

Lego’s tagline, “imagine”, implies that one’s own imagination is the only limit to what you can build. Of course, that’s not quite right. One of the book chapters explores the ways in which Lego comes with some inbuilt constraints, and how those limits actually help inspire sophisticated Lego builders.

Some of those limits lie in the nature of the bricks. With each set, we can build a world of our own creation, both literally and metaphysically. Another chapter explores the similarities between Lego worlds and our own world, constructing a metaphysics of the bricks.

Instructions constitute another set of limits for Lego creations - assuming, at least, that you’re the kind of player who follows the rules. And here we come to a divide in Lego users between those who follow the rules dogmatically, and those who ditch them altogether, in favour of free play. The Lego Movie mocks these two kinds of Lego users in exaggerated characters.

Lego sets, complete with a metaphysics and rules, profoundly shape the world in which we live. Sometimes Lego does this well, but not always.

Is Lego constructing your world?

The problem of Lego shaping what and how we think has come to the fore recently with the company’s increased gender-based marketing, as Rhiannon Grant and Ruth Wainman worry in their book chapter.

When Lego produces materials for children that assume girls are more interested in characters, stories and emotions, and boys are more interested in building, cars and explosions, they are both playing into a dominant cultural narrative that tells children how they should be, and helping to create a world in which children are shaped to fulfil those expectations.

This explains why so many objected in 2012 to the pink-and-purple Lego Friends, designed to appeal to girls’ feminine desire to care for animals or play house. As Rebecca Gutwald reminds us:

... the problem with Friends is that they seem to be presented as the only options for girls in this Lego world and in the world in general.

The fact that Lego Friend characters are not designed to be attached to the regular blocks creates a literal gender divide during playtime.

Of course, there is some good news: not long after Lego Friends were introduced, Ellen Kooijman’s all-female research institute set (above) was allowed to go into production. But it was quickly retired and it nevertheless buys into a gender-based conception of girls’ play.
Apart from building the equipment and figures, no engineering or scientific skills are embedded in playing with the set.

**Breaking down racial stereotypes**

That said, Lego has had more success with the issues around race and ethnicity. Its original all-yellow minifigures may seem to embody an idealistically well intentioned, racial neutrality, but Lego’s representation of race has tracked the changes in society’s own assumptions about race. The bricks and figures are tools for showing us how we think, and for encouraging us to change how we think about race.

This is an opportunity for Lego. If it is a tool for building anything, then it also is a tool for constructing new paradigms through which to think about race, gender and social justice. As Tyler Shores highlights in his chapter, Lego has the power to challenge the status quo, to encourage critical thinking and deep reflection about the world and to help children and adults alike to rethink the way we should inhabit this planet.

Now that would make the popular bricks a truly innovative and creative tool for the future.

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BASKET OF PLENTY
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