a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

UBC REPORTS

September 2010

Raised on high-speed

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With a new head coach, a rebuilt field and a fresh set of players, energy and excitement are buzzing through the air at Thunderbird Stadium. 3

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A New Look for UBC Reports

You can tell a lot about a person by the way they dress. In the same way, we want the look and feel of *UBC Reports* to reflect your university's personality. Last year, the university completed a two-year consultation to help identify our common story. It resulted in our new brand: UBC, A Place of Mind. Attributes that came up often were **open**, **bold**, and **innovative**. This edition of *UBC Reports* introduces a new look that is meant to reflect those values. Let us know what you think at public.affairs@ubc.ca.

In the news

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Printer
TELDON PRINT MEDIA

Publisher
UBC Reports is published monthly by:
The University of British Columbia
Public Affairs Office
310 – 6251 Cecil Green Park Road
Vancouver BC Canada V6T 1Z1

Next issue: 7 October 2010

Submissions
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Publication mail agreement no. 40775044.
Return undeliverable Canadian addresses to circulation department.
310 – 6251Cecil Green Park Road, Vancouver, BC Canada V6T 1Z1
Email: public.affairs@ubc.ca

Highlights of UBC media coverage in August 2010

Compiled by Heather Amos

Scientists observe 'fastest' evolution

UBC scientists say they've observed one of the fastest evolutionary responses ever while studying a fish species' ability to survive in colder water, reported ***United Press International***, ***Agence France Presse***, ***ABC News***, the ***New Zealand Herald*** and others.

A small fish known as the stickleback took only three years to develop a tolerance for water five degrees colder than what their ancestors could handle.

"Our study is the first to experimentally show that certain species in the wild could adapt to climate change very rapidly—in this case, colder water temperature," said study author **Rowan Barrett**, from the UBC Department of Zoology.

Polygamy has troubling implications for any society

The Guardian, ***Postmedia News*** and ***Q on CBC Radio*** spoke to UBC's **Joseph Henrich**, a member of the Departments of Economics, Psychology and Anthropology, about a paper he produced on the harms of polygamy.

Henrich found that polygamy increases crime, prostitution, anti-social behaviour and creates a greater inequality between men and women. Monogamy, on the other hand, gives huge advantages to societies which practice it.

"Monogamy seems to direct male motivations in ways that create lower crime rates, greater wealth (GDP) per capita and better outcomes for children," Henrich concludes.

Ottawa plans new rules for boat migrants

The ***BBC***, the ***Globe and Mail***, the ***Canadian Press***, ***CTV***, the ***Vancouver Sun*** and others spoke to **Benjamin Perrin**, a professor of law at UBC who specializes in issues surrounding human smuggling, about the arrival of hundreds of Tamils from Sri Lanka.

With the arrival of these migrants there is a growing concern about human smuggling and trafficking. This is the second Tamil ship to arrive in Canada in less than a year. In October, the Ocean Lady brought 76 Tamil men to Canada.

"The Ocean Lady was a probe to test the system. We certainly know that Canada has been a destination for smuggling and trafficking," said Perrin.

Tattooing linked to higher risk of hepatitis C

People with multiple tattoos covering large parts of their bodies are at higher risk of getting hepatitis C and other diseases, according to study led by **Dr. Siavash Jafari**, of UBC's School of Population and Public Health.

United Press International, the ***Vancouver Sun*** and others reported on the study that linked the incidence of hepatitis C after tattooing with the number of tattoos an individual receives. They suggest prison inmates and other groups with multiple tattoos should be the focus of infection prevention programs.

"Clients and the general public need to be educated on the risks associated with tattooing and tattoo artists need to discuss harms with clients," said Jafari.

Canadian trade missions ineffective, study says

The ***Globe and Mail***, ***Maclean's*** and the ***Vancouver Sun*** picked up a report by **John Ries** and **Keith Head**, professors at UBC's Sauder School of Business, suggesting that Canadian trade missions are ineffective.

Canadian trade missions are designed to bolster business relationships and increase bilateral trade. Head and Ries looked at 23 missions between 1994 and 2005, and analyzed trade data from one, two and four years after. The figures showed the missions did not significantly boost the exchange of goods and services.

"If following the mission there's no increase in trade, how can we say there are any benefits?" asked Head.

UBC football gets a facelift

"I want the players to have pride in the team, enjoy what they're doing and believe in what's happening," says Shawn Olson, who is heading into his debut season as head coach of the Thunderbird football team. One of Olson's first moves was to hire new coaching staff—all alumni. This is part of a new initiative to engage the alumni and create a new community.

Head coach **Shawn Olson** wants his football team to feel like they're a part of something great.

Martin Dee Photograph

©istockphoto/Colourfield

"We can make the playoffs, we have enough talent. All we need is a few wins early in the season."

The Thunderbirds haven't made the playoffs since 2006, and haven't won the Vanier Cup since 1997, when Olson was a quarterback for UBC. Now, there's a growing optimism that this season could be different.

The university's football team has undergone a re-haul since Olson was hired in January. The grass field has been replaced by synthetic turf; Olson has hired new coaching staff; and there will be 50 new faces on the field this fall.

The turf field represents a renewed support from UBC's athletics department. The old grass field was dangerous, scattered with potholes, and during the rainy fall football season, it transformed into a mud pit. With the new turf, the team can get more use out of the field, practicing and playing on it. It can also be used by other varsity teams and for recreational activities.

With 50 new players, and 60 returning, the team will be larger than normal. Olson recruited high school graduates who can grow with the team. But, he also brought in guys who are ready to play, including junior players and transfer students from Simon Frasier University (SFU) who want to stay in the Canadian Interuniversity Sport league instead of following SFU to the National Collegiate Athletic Association.

"I want them to compete every single day" says Olson. We will push each other to be the best team we can be."

Devin Kavanagh, a fourth-year linebacker who has been the T-Birds' captain for the past two years, advises incoming players to "be excited for what you're becoming a part of."

The kinesiology student says the team was really down after the efforts of the last couple of seasons didn't materialize into success. Kavanagh says Olson's attitude has made a difference.

"He's serious about the team," says Kavanagh. "He knew how to make this work and got right to it."

One of Olson's first moves was to hire new coaching staff — all alumni. This is part of a new initiative to engage the alumni and create a new community.

"It's about feeling like you're part of something. For that, you need strong, motivated and passionate supporters," says Olson, who played for UBC between 1996 and 2000.

"I have a vision of returning to everything at the heart of this sport: integrity, character, hard work, pride and passion." ●

Martin Dee Photograph

Gisele Baxter has noticed that in just a few years, incoming students have much more social media savvy.

Raised on high-speed communication

By Gisele Baxter

As another term starts, and you see so many students plugged in to social media, instead of assuming they could more usefully be reading a book or playing sports or meeting people face to face (and how do you know they don't do these other things as well?), consider this: here is a generation that has mostly come to accept high-speed multimedia global communication as a given. Ten years from now, where will they have taken its possibilities? What will they have accomplished?

It says something that Facebook by now seems almost quaint, and the first-generation networking sites like LiveJournal seem positively Jurassic. Twitter, tumblr, Foursquare, the infamous Chatroulette: it's difficult to keep up with all the possibilities for instant communication. In some ways the model for these is not really the old school-internet discussion board or email but text-messaging, whose chief appeal from the outset, apart from its instantaneousness, was its portability: hands up (my hand is up) if your first text was "I'm on the bus!"

But then portable communication itself has come a long way. There's a bit in the trailer for the Wall Street sequel when Gordon Gekko, on release from prison, is given back his mobile phone, a boxy 1980s device resembling nothing so much as Maxwell Smart's shoe phone. Eventually, we got something that pleasantly reminded geeks of the flip-up communicators on the original Star Trek.

Now, thanks to increasingly robust and widespread wireless connectivity, people using something roughly the size and shape of a playing card, and almost as thin, are managing email, taking pictures, watching streaming video, listening to music, and posting text and images to various social media venues while following the posts in real time of people at a variety of real venues all over the world. Expand the size of the playing card a little, and they can also read books and articles; they can carry a multimedia library around with them; they can carry around the Internet.

A few years ago in writing about social networking for *UBC Reports,* I pondered the simultaneous fear of privacy and increasingly compartmentalized obsession with trivia, or the development of genuine mass movements. The evolution has been swift and intriguing. Young people feel far less obliged to use these resources than many may assume, and are as apt to question their intrusions on privacy and relentless commercialism as to blithely ignore them. It's also increasingly difficult to define generations of users; even the significant demographic of younger teens ranges from the Twilight crowd to devotees of the new breeds of graphic novels. Suffice it to say that even in the short span of years between the articles, incoming university students now have much more awareness and experience of social media.

The technology is now mostly simple enough that even people who felt email was beyond them are joining in, promoting everything from crafts to animal rights to mash-ups of movie trailers to injustices and disasters as they happen. Indeed, a sort of chaotic simultaneity is the best way I can describe the landscape of social media: satire, comedy, tragedy, a community of close friends and neighbours, and of complete strangers throughout the world. Sometimes you are really reminded while staring into the screen that you are living in history, in all its banality and momentousness.

Yet it's worth remembering that the community still does not involve everyone, and it is always worth asking, when you learn that communications technology has been blocked or restricted anywhere, why this is, and what this says about the power of the shared word or image. ●

Gisele Baxter is an instructor in the Dept. of English.
http://faculty.arts.ubc.ca/gmbaxter

PHYSICS 101

Not your parents' university

The lecture halls might look the same, but parents of incoming first-year students may not recognize Physics 101. The world of learning has turned amid chirps of Twitter and Facebook status updates, not even Pluto is safe—the planet was reclassified in 2006 by the International Astronomical Union. **Peter Newbury**, a Science Teaching and Learning Fellow in UBC's Carl Wieman Science Education Initiative (CWSEI), points out what has changed—and what hasn't.

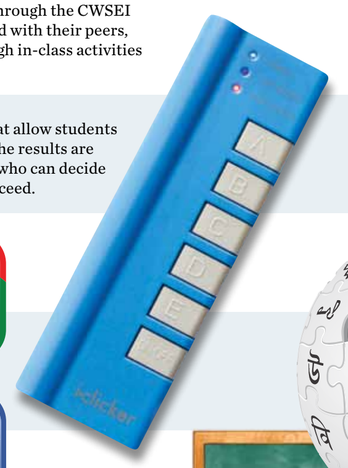
Your Parents	You
There were nine planets in the Solar System	There are eight planets in the Solar System.
Your professor told you about the planets.	You are a planet.
You got kicked out of class for cheating if you shared your answer with the person next to you.	You get poor participation marks for not sharing your answers with the person next to you.
Only the keeners answered the professor's questions.	Every student responds to the professor's questions using clickers—giving the prof instant feedback on whether the class "gets it" or not.
You saw your prof. once in a blue moon during office hours.	You're in constant contact with your prof through email, Twitter, Facebook, and WebCT.
You copied notes from the chalkboard.	You annotate the prof's PowerPoint presentation on your Netbook, iPad or download the entire lecture from iTunes U.
You spent hours buried in the library stacks poring through books and journals and photocopied relevant pages.	Google. Wikipedia. YouTube. 'Nuf said.
You worked on homework, at home, alone.	Problem-solving work groups are facilitated by teaching assistants, who only answer your questions with more thought provoking questions.
Your syllabus reads: *Chapter 4: Waves. Learning Goal*: By the end of the course, you should be able to give examples of wave phenomena in water, strings, sound and light; write down and interpret the mathematical formula for a wave; and give examples of everyday situations in where wave phenomena occur.	Learning goals explicitly define what a student has to do to demonstrate they "get it" and make it easy for students to study as each goal can easily be turned into an exam question. This takes the guessing out of learning. Students aren't speculating what the profs expect them to know by the end of the term and profs know for sure if the students grasp the key concepts.
You passed or failed by your final exam.	You (and your prof) are continuously evaluated throughout the semester.
Your prof performed a demonstration at the front of the room. You sat too far back to see it.	You do your own experiments using computer simulations, or sims, such as those at: phet.colorado.edu.
F = m a	Some things never change. Thanks, Sir Isaac Newton.

Lunar and Planetary Institute

At UBC, Newbury introduced the Human Orrery into Physics and Astronomy curriculum, where students role play the solar system.

Jill Pittendrigh, UBC Library

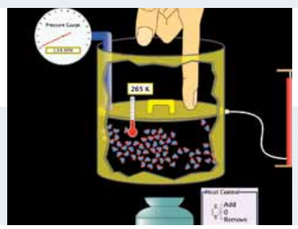
A key feature of courses transformed through the CWSEI is that the students are actively engaged with their peers, generating their own knowledge through in-class activities and discussions.



Clickers are TV remote-like devices that allow students to answer multiple choice questions. The results are immediately tallied for the instructor, who can decide whether or not the class is ready to proceed.

The beauty of peer instruction lies in the fact that you have to know the material yourself before you can explain it to others. Working with a small, non-threatening group of peers promotes "metacognition": realizing what you know, how well you know it and what you don't know.

Martin Dee



PhET Interactive Simulations

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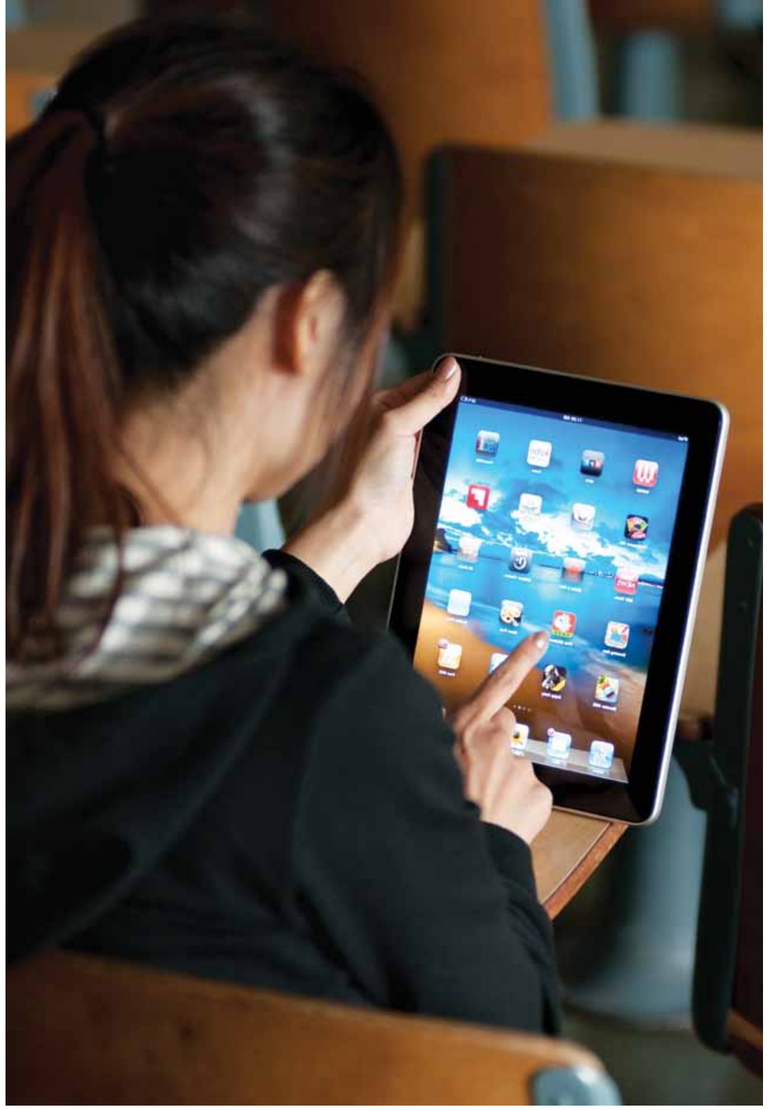


Martin Dee Photograph

Top tech trends for 2010: Open content and mobile computing

By Michael Wong,
Centre for Teaching, Learning and Technology

Open content and mobile computing are two technological trends which are about to have a very big influence in higher education.

Recent developments, as well as growing use of open educational resources (OER) and mobile phones, have laid the groundwork for these two trends to reach a tipping point and create a new community.

The *2010 NMC Horizon Report*, a report identifying emerging technologies that will likely impact post-secondary institutions in the next five years, highlighted open content and mobile computing as two technological trends to watch this year. Over the last few years, more people have become comfortable sharing their information online through open media platforms such as Twitter and blogs. At the same time, there has been an upsurge in the use of smart phones and other mobile devices to access the Internet anywhere at any time. It is only a matter of time before they catch on in a large scale at higher education institutions. At Abilene Christian University for example, all incoming freshmen were issued an iPhone or iPod touch in 2009. Meanwhile, an open educational resource (OER), www.smarthistory.org., has been developed to replace traditional art history textbooks with an interactive website.

At UBC, the course "ETEC 522: Ventures in Learning Technology" is leading the charge in open content development. Offered in the Master of Educational Technology program, ETEC 522 introduces students to emerging learning technologies. The entire course is hosted on a public UBC blog and wiki. Brian Lamb, manager of emerging technologies and digital content at the Centre for Teaching, Learning and Technology (CTLT), points out that the content is not only shared as an open resource, but "dynamic open content is created by students as the course progresses through open activities, open instruction, and open learning."

Course instructors David Vogt, director of digital learning projects in the Faculty of Education, and David Porter, executive director of BCcampus, note that an important aspect of the course is the creation of open educational resources - learning materials that are freely available for anyone to use, remix, and redistribute. According to Vogt, "the major collective undertaking of ETEC522 students is to critically analyze a course topic, present it as an interactive learning experience for their peers, and then publish it as an OER for other learners everywhere."

For Porter, this is one of the interesting differentiators for this class, as the OER will live on the course wiki well after the course has completed. Jeff Miller, course designer for ETEC 522 and senior manager of distance learning at CTLT, says that by sharing these resources, students "enrich the learning of their peers and make public contributions, as scholars, to their field of study."

One aspect of the course which is sure to have ramifications is that the majority of students in ETEC 522 are teachers themselves, and they regularly take what they learn about emerging technologies and apply it to their own classrooms in the K-12 and post-secondary sectors. Miller explains that this transfer has the potential to influence pedagogical practices of teachers, a key goal of the Master of Educational Technology program.

Built on open platforms, ETEC 522 uses mobile-ready technology. Porter says that "some students use mobile devices to keep in touch with RSS feeds for the class blog, and ETEC 522 has a unit on mobile technologies that requires students to probe the current possibilities."

The student developed open educational resources for ETEC 522 can be found on the course wiki: http://wiki.ubc.ca/Course:ETEC522/2010ST1. ●

Class of 2014: Defining Canadian moments

What Canadian experiences have influenced the perspectives of students entering university this year? UBC's Public Affairs office has prepared a list of influential Canadian experiences for incoming students born in 1992. This list is inspired by the Beloit College Mindset List, which for 12 years has published observations about experiences that have shaped the mindset of students entering US post-secondary institutions.

1

The first SMS text message was sent in 1992, the year incoming first-year students were born. The web browser Mosaic, credited for popularizing the Internet, was launched the year after. While not Canadian inventions, these developments have profoundly shaped those growing up in Canada.

2

This generation was 10 when Canada's Research in Motion launched the first Blackberry smartphone, 12 when Facebook brought them social networking, and 13 when YouTube was created.

3

There have always been 24-hour news channels like CBC Newsworld and CTV News Net for these students. But they would most likely only have heard of Pamela Wallin and Michaelle Jean for their roles in government.

4

Incoming Canadian students born in 1992 have always paid the GST. But they cannot remember Prime Minister Brian Mulroney, whose government introduced it, being in power.

5

For most of their lives, they have been able to get to PEI by bridge, which was started the year after their birth and completed in 1997 when they turned five.

6

Nunavut has been part of Canada since they were seven.

7

For this generation, Rene Levesque, Barbara Frum and Lorne Green have always been dead.

8

If they know Canadian actor William Shatner, it is more likely for his role in more than 100 episodes of *The Practice* and spinoff *Boston Legal*, and not for exploring space, the final frontier.

9

When they were born, the Loonie had already been in circulation for five years. The Toonie was introduced when they were four, in 1996.

10

These students have hazy memories of the Great One playing hockey, perhaps seeing his last game in 1999, when they were seven.

11

Their parents might have fond memories of the A&W drive through. This group of students grew up eating Timbits.

12

They were one when Celine Dion and Shania Twain had their first international hits. They likely paid more attention at 10 when Avril Lavigne released her debut album, *Let Go*, and they were 13 when Lavigne was voted Artist of the Year at the Junos.

13

These students were nine when they saw the launch of the TV show *Degrassi: The Next Generation*. But that was already the fourth iteration of the original 1979 *The Kids of Degrassi Street*. The series had them hearing about real world issues of child abuse, sexual identity, gang violence, self-injury, teenage pregnancy, and drug abuse.

Sauder students partner up with B.C. communities

By Glenn Drexage, UBC Library

Partners such as the Terrace Economic Development Agency and the Campbell River Chamber of Commerce helped broker relationships in their respective regions.

A pilot program that involved students from UBC's Sauder School of Business working with entrepreneurs and non-profits in B.C. communities is set to become a permanent fixture of the University's community service-learning (CSL) efforts.

And that's a win-win scenario, given the value of the services provided and the real-life experience gained by students (CSL combines classroom learning with community volunteer work).

"The experience grounded the learning I have achieved in my program and in class, offering insight into the difficulties faced by non-profits and a further respect for their efforts," says Jonathan Bowers, a pilot participant in his final year of the part-time MBA program at Sauder.

Bowers was one of 74 Sauder students who recently participated in 22 projects for the communities of Terrace, Atlin, Courtenay and Campbell River.

In 2009, the Irving K. Barber Learning Centre approached the UBC Learning Exchange and Sauder—through its research centre ISIS, which serves as the project's home—to inquire about starting the pilot, based on feedback from earlier visits to B.C. towns.

The pilot began last fall, and featured students consulting on projects that were based on content in five courses (two e-business courses, two marketing classes and an information systems and analysis class).

While the majority of the community participants were small businesses, some non-profits and professional associations were also involved. Meanwhile, partners such as the Terrace Economic Development Agency and the Campbell River Chamber of Commerce helped broker relationships in their respective regions.

Thirteen projects were conducted for Terrace, and their benefit was keenly felt. "I've seen marketing plans from consultants for some of our local businesses that cost between $10,000 and $15,000 with less substance than the deliverables from the CSL student groups," says Larry Jones, a Business Analyst in Terrace with Community Futures, which supports small- and medium-sized companies and community economic development. "This project offers opportunity to the north that does not come along every day."

While the pilot featured some face-to-face meetings, much of the work was conducted remotely via e-mail, Skype software and telephones. **Bowers worked on his six-week project with three other MBA students to develop a set of recommendations for e-business strategy at the Terrace and District Community Services Society.** Meanwhile, another group worked on an e-marketing strategy for B & C Teaching Tools, a small business that sells educational resource and toys, and supplies several schools in northwest B.C.

Don Erhardt Photograph

Jonathn Bowers was one of 74 Sauder students working in Terrace, Atlin, Courtenay and Campbell River.

"The community partners that we worked with really recognized the potential in connecting UBC students with small businesses and other organizations in their towns," says Rebecca Kindiak, who co-ordinated the first year of the pilot.

"It shows how the various assets of the university can be deployed in really interesting ways to work with communities," adds Sandra Singh, Director of the Learning Centre, which provided the bulk of the first-year funding for the project. The UBC-Community Learning Initiative (or CLI, a Learning Exchange unit) also contributed funds, while ISIS and the CLI offered management guidance and strategy. "The value really lies in the unique learning experiences that are created through this initiative," notes Joanna Buczkowska, Managing Director at ISIS.

Moving forward, the plan is to expand the pilot's ambitions—both in terms of participants (faculty, students and partners) and a deepening of relationships. "Currently, I am exploring new partnerships with communities in Pemberton and the Clayoquot Sound region (Port Alberni, Tofino and Ucluelet)," says Andrea Lloyd, Sauder's CSL Co-ordinator. "We will also likely have five new Sauder faculty members, in five different courses, participating in September." ●

Initiative builds community partnerships

The **UBC-Community Learning Initiative** (CLI), a unit of the **Learning Exchange**, is a network of people working to advance community service-learning (CSL) and community-based research (CBR) at UBC. The CLI's priorities are to enhance student learning, collaborate with community, and weave CSL and CBR into the University's academic fabric.

In 2009/10, nearly 1,300 students enrolled in CSL and CBR courses supported by the Learning Exchange, and the UBC-CLI worked with 77 non-profit organizations, 121 public schools and 10 small businesses. The CSL or CBR projects or placements were integrated into 35 courses.

A new teaching tool with the classic wiggle

By Lorraine Chan

Asst. Prof. Eric Lagally and PhD students Tony Yang and Eric Ouellet have created a fun way to teach younger students and the general public about microfluidics using Jell-O®

Microfluidics is about controlling the flow and reaction of a small amount of fluids within a tiny area. This inter-disciplinary field has spurred advances in physics, engineering, microtechnology and biotechnology with innovations such as lab-on-a-chip and DNA chips.

A paper by Yang, Ouellet and Lagally, recently published in the American Chemical Society's *Analytical Chemistry*, outlines simple steps to teach how microfluidic chips can be fabricated in a classroom for about two dollars per jello chip.

"I've had more response to this than any other papers I've published," says Lagally, who is jointly appointed at the Michael Smith Laboratories and Dept. of Chemical and Biological Engineering, Faculty of Applied Science.

"As far as we know, we're the only ones in the world to have come up with a quick, safe and inexpensive way to demonstrate and teach the principles of microfluidics to young students and non-scientists."

Jello resonates with kids so this work serves as a bridge between young students and scientists.

Yang, whose thesis explores chemical and biological engineering and micro-fluidics, explains that pouring jello into a mold is analogous to soft-lithography, which is the process typically used to make microfluidic chips out of elasto-meric materials.

The main materials used to create the molds are foam plates, wooden coffee stir sticks, and double-sided tape. The coffee stir sticks are cut into different shapes and sizes depending on the purpose of the mold and then taped onto a foam plate using double-sided tape, creating a specific pattern.

The chips themselves are made by pouring a liquid mixture of jello and additional gelatin onto the molds and then leaving them to cure for two days in a refrigerator. The chips are then removed from the refrigerator, peeled from the molds, and placed in aluminum dishes for demonstrations.

"We produced three types of molds for the experiments described in our paper: a jello mold, a Y-channel mold, and a pH sensor mold," explains Yang.

Using these, teachers can then demonstrate concepts such as pressure-driven flow, laminar flows and a jello lab-on-a-chip to detect whether solutions are basic or acidic.

"Just about any sort of web chemistry experiment at the bench top can be miniaturized so it can be under greater control via a lab on a chip," says Lagally.

"Jello resonates with kids so this work serves as a bridge between young students and scientists" adds Yang. "As microfluidics continues to become an integral part of our daily lives, it's important to get students excited about this research and also to get them thinking about possible careers in science." ●

To read the Analytical Chemistry paper, visit:
www.publicaffairs.ubc.ca/ubc-reports

Materials for making jello microfluidic chips

2 × 85 g boxes of lemon-flavored jello powder

1 pouch (7 g) of unflavoured gelatine such as Knox

2 beakers of 120mL of purified water for dissolving jello and gelatine

6″× 6″ foam plates, round

1 drinking straw, round

No-stick cooking spray

Several 7″ wooden coffee stir sticks

Green food dye

Single and double-sided tape

6″× 5″ aluminum weighing pan

Scheme for producing jello chips using soft lithography.

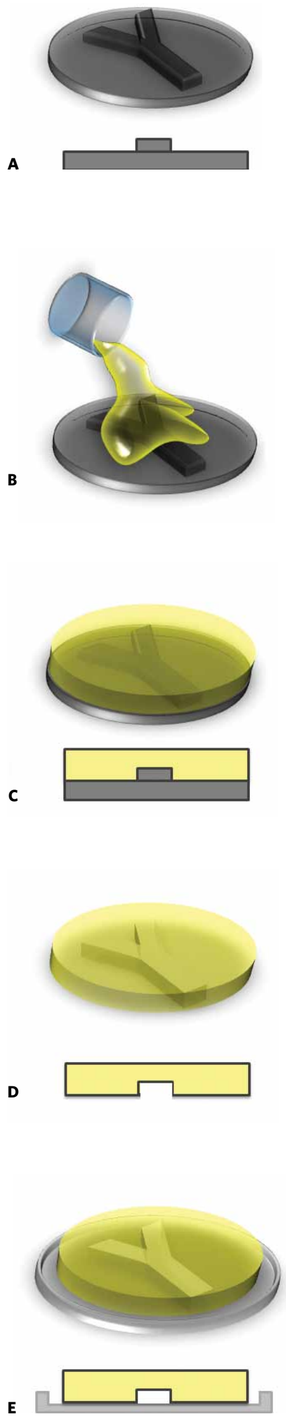
A A negative mold is made with desired features.

B Liquid chip material is poured onto the mold.

C Mold with liquid material is cured.

D Solidified chip is peeled off and

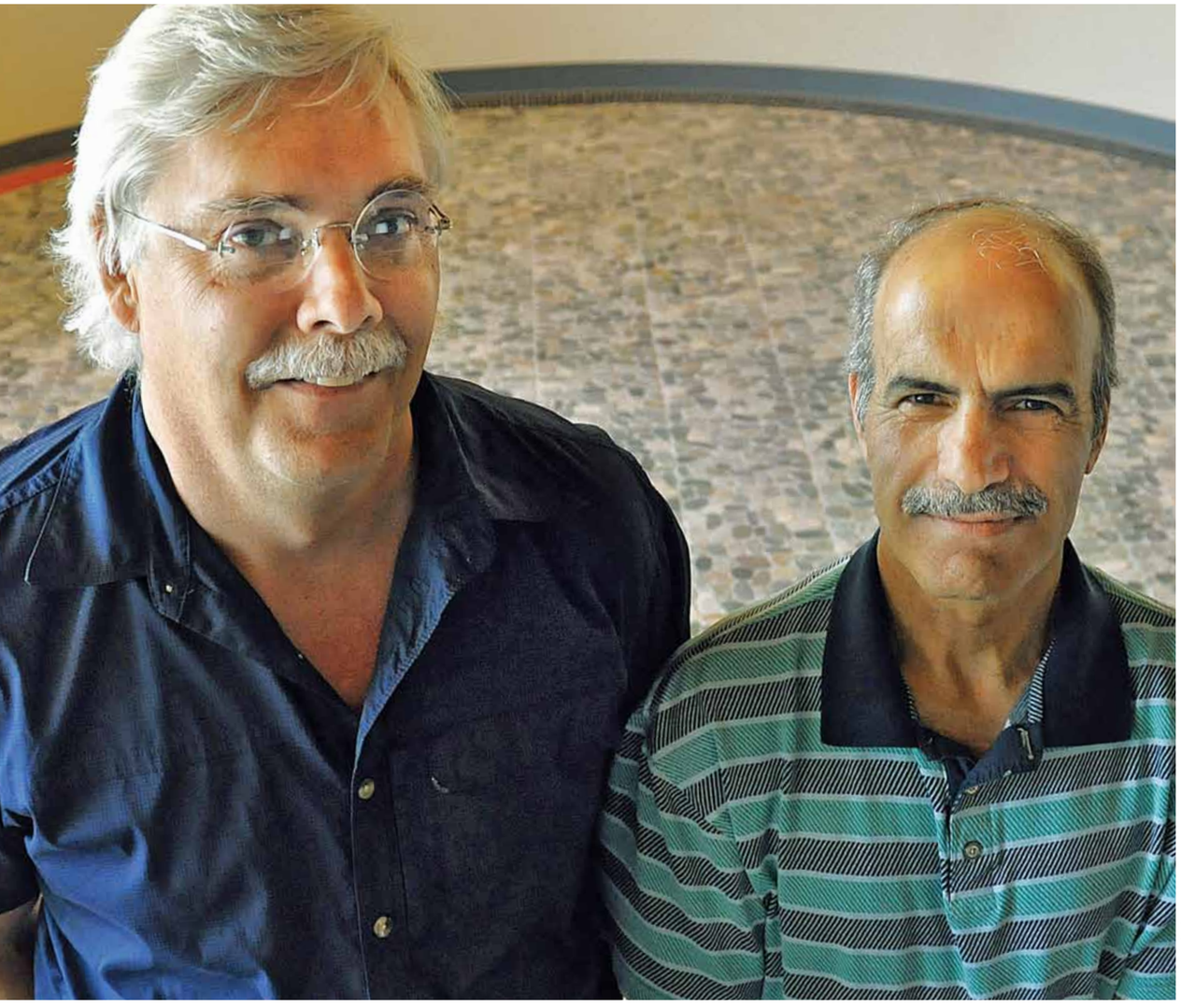
E Placed on a rigid substrate for experiments.



Math from an Aboriginal perspective

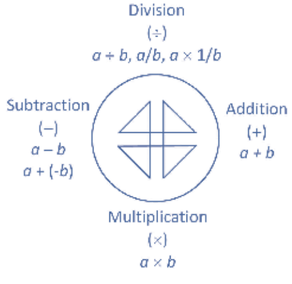
By Jody Jacob

Faculty and staff at UBC's Okanagan campus have designed a new foundational mathematics course that uses an Aboriginal perspective in the application of basic math concepts.



Jody Jacob Photograph

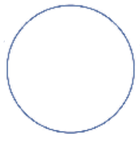
Lyle Mueller, Director of Aboriginal Programs and Services, and Associate Professor of Mathematics **Javad Tavakoli**.



The circle: an Aboriginal approach to math

An Aboriginal perspective of math can be illustrated with the most basic concepts related to the four arithmetic operations used with real numbers: division, subtraction, addition and multiplication, all of which are interrelated.

The course is built on this simple foundation—including the concepts of balance and interrelationships—to develop the intricacies of math. This Aboriginal perspective (see image on right) is used to build an understanding of properties, sets, exponents, quadratic equations, geometry and trigonometry.



Although specifically geared to Aboriginal students in the Access studies program, the course is open to anyone who would like to gain a better understanding of math by combining Aboriginal thought and traditional mathematical training.

"Math is math—we're just changing the way we look at math," says Lyle Mueller, director of Aboriginal Programs and Services. "We've designed this course using a fairly common Aboriginal perspective to provide the framework of the lesson."

The design of the course is based on an ancient symbol used by many First Nations people in North and South America: the medicine wheel. It expresses relationships in sets of four, with a focus on wholeness and interrelationships.

"It would be fair to say that an Aboriginal student with some traditional knowledge and understanding of Aboriginal culture will find that the mathematical concepts and theories are broken down into a way that is familiar to them, and therefore perhaps easier to learn," says Mueller.

The design of the course is based on an ancient symbol used by many First Nations people in North and South America: the medicine wheel.

The course, MATH 126, can serve as an introductory pre-calculus course, and provides an academic stepping stone for students wishing to pursue the sciences. It is a UBC Senate-approved, three-credit course designed by Mueller and mathematician Javad Tavakoli in consultation with the UBC Okanagan/Okanagan College Aboriginal Council.

"It's really just a good way of organizing the often complex and interrelated concepts of math," says Tavakoli. "Any student, no matter who they are, if they don't understand math at the beginning, will either learn to hate it or they will quit it or fail it. This course offers students a different option to learn math—perhaps in a way that they can relate to or that inspires curiosity and understanding.

The official course book, which Mueller and Tavakoli have been working on for nearly five years, is in the final stages of development and will be ready for the winter semester.

Chris Alexander, a second-year Bachelor of Management student and member of the Westbank First Nation, took the course in 2009, passing with a mark above 80 per cent.

"I found the course challenging because I am a mature student," says Alexander. "But the support from teachers' assistants and Aboriginal Programs and Services was great.

"I hadn't taken math in years. The course used the medicine wheel to help explain some of the problems, which made it easier for me to wrap my head around." ●

A national accord on indigenous education

By Heather Amos

On June 1, members of the Association of Canadian Deans of Education (ACDE) signed an Accord on Indigenous Education. This accord was developed to create a respectful and inclusive education curriculum that reflects the needs of Aboriginal people. Jo-ann Archibald, associate dean for Indigenous Education in the Faculty of Education at UBC, was one of the co-chairs who led the developmental and writing process for the Accord and sat down with UBC Public Affairs to talk to about it.

What is the Accord on Indigenous Education?

We wanted to ensure that indigenous culture, knowledge, histories and language have a more central place in education, from Kindergarten through Grade 12 and into post-secondary. This means increasing the number of Aboriginal teachers in the classrooms, Aboriginal researchers at universities and offering educational programs relevant to Aboriginal people. There also needs to be a better understanding of Indigenous histories and culture from an Aboriginal perspective. The majority of the responsibility falls on the Faculties of Education because we prepare educators at all levels including early childhood, K-12, community education and post-secondary.

Why is this important?

This is the first time that an accord has brought together Faculties of Education across Canada to deal with Indigenous education at both local university and national levels. Improving Indigenous education will take cooperative and sustained effort from universities, Aboriginal communities and organizations, and governments. By creating opportunities for collaboration and developing goals, principles and strategies, we will effect change and make significant improvements to Indigenous education.

What is UBC doing?

Our Faculty is a leader in Aboriginal education. But, we believe that we can do more to improve Indigenous education. For example, our teacher education program will have a required Aboriginal education course that will prepare students to teach Aboriginal learners and to include Aboriginal content in their instruction. We are hiring more Indigenous faculty members to address key areas of education such as curriculum, languages, culture and health, and Indigenous counseling. We're developing a strategic plan for the faculty with the crosscutting theme of Indigenous education, which contains some of the strategies from the Indigenous accord.

How will the accord work across the country?

Faculties across the country have already achieved some of the goals laid out by the accord, so we know it's do-able. Now the deans will develop an implementation plan, discuss future cooperative efforts and continue to share their successful and challenging experiences. ●

Jo-ann Archibald, associate dean for Indigenous Education in the Faculty of Education at UBC.

Martin Dee Photograph

The greenest city

Students research how to make Vancouver a leader.

By Ann Campbell and Madelen Ortega, UBC Sustainability Initiative

This summer, UBC students worked alongside City of Vancouver staff to address the municipality's Greenest City goals

As a child growing up in Brampton, Ontario, Sara Orchard loved water. She swam at her family's cottage and lounged around swimming pools. Like every carefree kid, she ran through sprinklers on hot summer days.

Getting Orchard to admit that last detail is not easy now that she has spent the summer as a Greenest City 2020 Scholar working on water conservation issues with the City of Vancouver. "We're not supposed to as graduate student pursuing a Master of Landscape Architecture, says with a smile. "But every kid loves water."

Such refreshing honesty—as well as solid sustainability expertise—are just two of the qualities that nine UBC graduate students brought to their summer work at the City, where they collaborated with staff to develop plans to implement the long-term goals of the Vancouver 2020 Greenest City Action Plan. The project is one of the initiatives arising out of the memorandum of understanding signed between UBC and the City of Vancouver on May 11, 2010.

Each student was responsible for researching global best practices to meet one of the 10 goals, which include green economy and green jobs, greener communities and human health.

Orchard focused on the City's clean water goal. She researched metering programs and water consumption and organizations and says the program offered the perfect setting to apply her knowledge in water conservation, environmental education and design. "It has been really satisfying to bring my expertise to the job."

Peter Navratil, Orchard's program supervisor and manager of the City's Waterworks Design Branch, agrees. "Our department is used to having engineering students and we're normally showing them the ropes," Navratil says, "but with Sara's previous work in water conservation and demand management, she was to some degree showing us the ropes. We learned from her."

Navratil says Orchard's contributions have helped the City to move one step closer to meeting its Greenest City goals. "Sara picked up the research by three or four other people and pulled it together. She has written our draft implementation plan that we're now nailing down. It's really her legacy piece, and we're going to be able to take this to council," he says.

Making academic knowledge relevant in the world outside academia is what appeals to program participant Malcolm Shield, a PhD student in Mechanical Engineering. His work focused on the City's climate leadership goal and addressed carbon-neutral operations, carbon accounting and reduction pathways, and funding for electric-vehicle charging infrastructure field tests.

"It's very different being outside the ivory tower," says this British native who came to Canada in 2004 to study at UBC.

Scholars like Shield are key to ensuring that the City implements its action plan successfully, says Brian Beck, a Project Manager in the Sustainability Group at the City, and Shield's supervisor in the program.

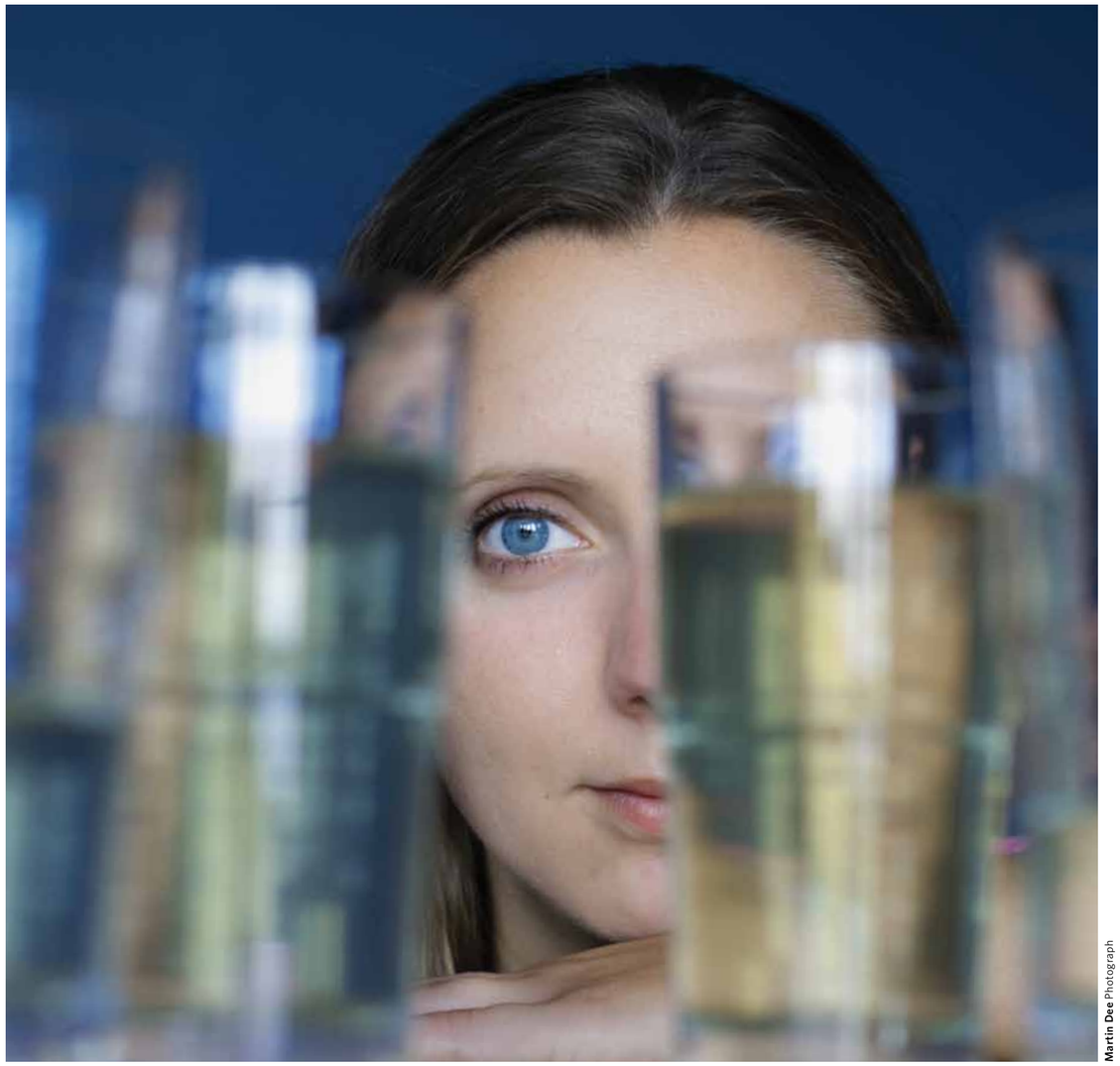
Orchard focused on the City's clean water goal. She researched metering programs and water consumption and organizations and says the program offered the perfect setting to apply her knowledge in water conservation, environmental education and design.

"The problem we as practitioners in city government have with a lot of the work we do is that we have very little time to work in each of these areas. With leading edge initiatives like this that aren't being done anywhere, or are not being done to the degree that they're easily repeatable, we rely on someone like Malcolm to get through some of the work, to get to the essence of what we need to be able to communicate to our stakeholders," he says.

Although program participants like Orchard and Shield have contributed to serious issues and established professional contacts, all the hard work took place in an inclusive and supportive setting—with great people.

"The City of Vancouver is a very welcoming place, this has been a very positive experience for me," Orchard says. ●

Sara Orchard drafted an implementation for water conservation.



Martin Dee Photograph

GOAL 1
Green Economy Capital: Secure Vancouver's international reputation as a mecca of green enterprise
Abhijeet Jagtap, *Sauder School of Business, pursuing a Master of Business Administration* Documented, categorized and surveyed green companies in Vancouver. Analyzed two different methodologies for estimating the green jobs in the city. Recommended strategies to double the number of existing green jobs.

GOAL 2
Climate Leadership: Eliminate Vancouver's dependence on fossil fuels
Malcolm Shield, *Faculty of Applied Science, pursuing a PhD in Mechanical Engineering* Researched and recommended best practices for municipal carbon neutral operations; as well as development of infrastructure planning aimed at encouraging and field-testing the early up-take of plug-in electric vehicles.

GOAL 3
Green Buildings: Lead the world in green building design and construction
Jay Worthing, *Faculty of Applied Science, pursuing a Master of Architecture* Contributed to the groundwork for widespread building energy labelling throughout Vancouver and for an outcomes-based energy code pilot project. Worked to integrate these items into a strategic plan for carbon neutrality in new construction by 2020.

GOAL 4
Green Mobility: Make walking, cycling and public transit preferred transportation options

GOAL 5
Zero Waste: Create zero waste
Valerie Presolly, *Sauder School of Business, pursuing a Master of Business Administration* Developed guidelines for waste management project evaluation based on triple-bottom line analysis. Analyzed best practices for corporate waste reduction and municipal waste management and gave recommendations for Vancouver's Zero Waste plan

GOAL 6
Easy Access to Nature: Provide incomparable access to green spaces, including world's most spectacular forest
Lindsay Bourque, *School of Architecture and Landscape Architecture, pursuing a Master of Landscape Architecture* Conducted an inventory of Vancouver's current parks, greenways and bikeways to create a comprehensive map of Vancouver's green network as well as investigating the impact of lane houses on the urban canopy cover.

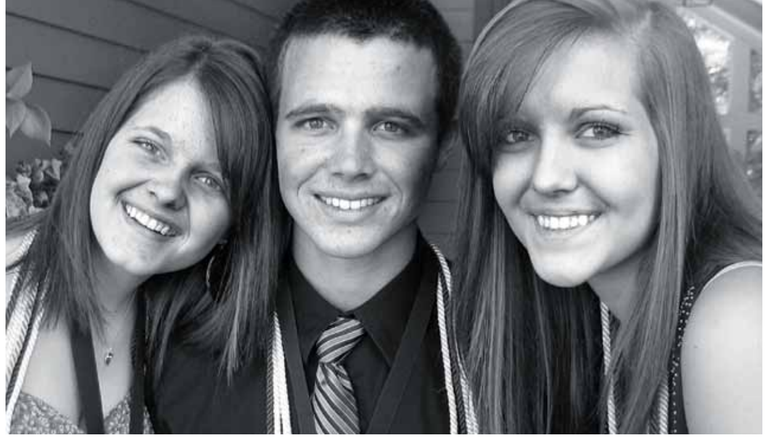
GOAL 7
Lighter Footprint: Achieve a one-planet ecological footprint
Cornelia Sussmann, *School of Community and Regional Planning, pursuing a PhD in Urban Planning* Examined the challenges and opportunities of pursuing a one-planet ecological footprint target for the City of Vancouver, determining the City's scope of jurisdiction and how ongoing progress can be measured.

GOAL 8
Clean Water: Enjoy the best drinking water of any major city in the world
Sara Orchard, *School of Architecture and Landscape Architecture, pursuing a Master of Landscape Architecture* Researched metering programs, water consumption and conservation rates in other cities and organizations. Examined metered homes for seasonal differences in water use. Researched precedents for IC&I water programs in other cities and conducted interviews with Vancouver businesses that have reduced water in the last two years.

GOAL 9
Clean Air: Breathe the cleanest air of any major city in the world
Adam Hyslop, *School of Community and Regional Planning, pursuing a Master of Science in Planning* Assessed the implications of biomass combustion for district energy within urban areas and reviewed regulatory frameworks for emission control and international standards for air quality.

GOAL 10
Local Food: Become a global leader in urban food systems
Tegan Adams, *Integrated Studies in the Faculty of Land and Food Systems, pursuing a Master of Science* Worked to define "local food" and "low carbon food." Brought together members of the public sector to explore what standard food procurement policy guidelines might be implemented across public food outlets in Vancouver. ●

To learn more about the 2020 Greenest City Action Plan, and see the City's 10 long-term goals and the students who worked on them, visit: www.publicaffairs.ubc.ca/ubc-reports
Vancouver 2020 Greenest City Plan http://vancouver.ca/greenestcity



Lindsey, Joe and Natalie Pozo come to UBC from Oregon, following their grandfather.

A triplet delight

"We got this feeling that UBC is an awesome place with the right energy."

By Heather Amos

No one living in the Pozo household expected Natalie, Joe and Lindsey, 18-year-old triplets from Portland, Oregon, to stick together once they graduated from high school.

The triplets run on different schedules, have separate groups of friends and have their own interests. Joe works hard, has an active social life and keeps busy with golf, baseball and basketball. Natalie loves to paint, recently took up long boarding and excels at math. Lindsey is a gifted photographer, has been dedicated to the piano since Grade 2 and now teaches it too. Both females are also heavily involved in volunteer work, and are members of the youth advisory committee for Tualatin, the city just outside of Portland where the Pozo's live.

"We had no intention of going to university together," says Lindsey, who along with her brother and sister will be starting first year at UBC's Vancouver campus this September.

Knowing they wanted to move out of Oregon but stay in the Pacific Northwest, the family travelled up and down the coast visiting schools. They decided to take a peek at UBC, after speaking to a recruiter at a college fair. When all three Pozos chose UBC, everyone was surprised.

"We got this feeling that UBC is an awesome place with the right energy," says Joe.

Mom Judy was thrilled with the decision. Not only is it easier to keep on top of registering for classes, residence applications and payment deadlines for only one university, but she also has a sentimental tie to the school.

Her father Denis Archibald, the triplets' grandfather, is a UBC alumnus (1958). He and Judy's mother lived in Vancouver while he completed an electrical engineering degree. Later, Judy's father was instrumental in developing a technology to divert missiles during President Lynden B. Johnson's presidency.

"UBC was a big part of him doing well in life," says Judy. "There was a lot of praise for the university and for Vancouver."

"Whenever we visit family, they tell us stories about him, and how he was such a great person. It's nice to know that he went to the same school that we are going to," said Lindsey.

In September, Lindsey will be starting a Human Kinetics program, with aspirations of becoming an occupational therapist. Natalie is enrolled in the Co-ordinated Arts' Individual and Society program that focuses on economics and psychology. Joe is heading into the Wood Products Processing (WPP) program in the Faculty of Forestry

"I was supposed to do science, and I was on campus looking for the building where I had to go to register for classes. Instead, I stumbled into the wood products processing plant. They gave me a tour and I realized WPP combines what I was really looking for: science and business."

The siblings are not planning to live together, or even in the same residence. They want to make their own friends, but know they can rely on family.

"If we need to talk to someone, we're in the same place," says Natalie. "We could have gone so far away from each other."

The size of UBC allows the triplets to go to school together, but have their own identities.

"There will be so many people to meet, so many people to be friends with. It's a new chapter," says Natalie.

Natalie, Lindsey and Joe's father Steve, their 13-year-old sister Mandy and Judy are all making the trek to Vancouver to say goodbye in September. They'll be missed at home, but Judy is happy her children will have the chance to live in Canada.

"I want my kids to embrace Canada and Canadian heritage. It's such a wonderful part of the world." ●

Read about the Pickerings, three California siblings also at UBC. www. publicaffairs.ubc.ca/ubc-reports

Recruiting international students to UBC

By Aaron Anderson

UBC's International Student Initiative (ISI) recruits international students for UBC's undergraduate programs, and provides advising and support for prospective international students and Canadians outside Canada.

ISI was instrumental in bringing Lindsey, Joe and Natalie Pozo to UBC. Every year, ISI recruiters host hundreds of school and public information sessions abroad. In 2009-10, ISI visited 63 countries and 18 U.S. states. ISI collaborates with faculties and student services across UBC campuses in supporting international student success. International students come from 140 different countries. Their unique ideas and perspectives enrich the intercultural understanding of all students and are tangible evidence of the University's growing engagement with the global community. Among ISI's information publications for prospective students is the interactive website, www.connectionsforlife.ubc.ca. ●

Who's selling these weapons?

By Simmi Puri, Faculty of Law

UBC prof seeks corporate accountability

It was known as the Great War of Africa and the deadliest conflict worldwide since World War II. By 2008, the war that began in the Democratic Republic of Congo and involved eight African nations had **killed 5.4 million people**.

Martin Dee Photograph

Law professor **James Stewart** is helping shift the focus of international criminal law.

At the crux of the war, and what many argue fueled the conflict in Congo and other African regions, was the growing availability of small arms.

Where were these weapons coming from and why were the suppliers not being held accountable?

It's these questions that were the primary catalyst for UBC Law professor James Stewart to pursue a career in international criminal law, specifically focusing on the relationship between commerce and atrocity.

"International criminal justice focuses too much on the human rights types of issues," explains Stewart. "We as prosecutors wait until the violence has run its course and then we mop up when we prosecute for murder, torture, rape and so on."

In his work, Stewart argues that it is much more effective to prosecute businesses involved in selling weapons to notoriously brutal regimes, before all the violence unravels.

Stewart's work in this area has been recognized internationally and is part of a major shift in international criminal justice, where governing bodies are becoming more conscious of the link between business and crime, and more sensitive to the importance of holding corporations accountable.

Stewart, who before joining the Faculty of Law at UBC in 2009 worked as a prosecutor for the International Criminal Tribunal for the former Yugoslavia, recently began a fellowship with the Open Society Institute. As part of this fellowship, Stewart is writing a manual setting out the legal basis for prosecuting arms vendors for their involvement in international crimes, such as war crimes and genocide. Stewart argues that prosecuting corporations and their representatives for international crimes would enable courts to influence the trajectory of ongoing conflicts, rather than merely dispensing justice once violence has run its course.

Stewart describes these activities in conflict zones like Congo and Rwanda as a vicious triangle.

"At the apex of this triangle is the continuation of arms violence characterized by human rights violation. In the bottom right hand corner is illegal exploitation of natural resources and in the other corner is illicit arms trafficking.

"Each of these flows into each other, creating a downwards spiral into darkness which means that the war in Congo and other similar conflicts around the world become self-sustaining war economies. This becomes a win-win situation for belligerents but intractable violence for civilians."

Stewart hopes that his manual will give activists and policymakers new and powerful tools to compel corporate compliance in the arms trade, and offer new insights into the potential of international criminal justice. While his work is in response to the events that have taken place in Congo, he hopes that it can be used as a template for arms transfers in all other countries.

"We've flooded the world with weapons and studies have shown that weapons kill approximately 2,000 people a week."

The arms industry is a strange thing," says Stewart. "When the world's economy took a downturn, the arms industry flourished. We've flooded the world with weapons and studies have shown that weapons kill approximately 2,000 people a week. There needs to be international standards for weapon distribution."

Stewart's efforts recently garnered him the inaugural Antonio Cassese Prize for International Criminal Law Studies. The award is for the most original and innovative paper published in the Journal of International Criminal Studies. His article, "Atrocity, Commerce and Accountability: The International Criminal Liability of Corporate Actors," features research from part of his PhD thesis, conducted at Columbia University, which focuses on corporate responsibility for pillaging natural resources.

"The fact that they are recognizing my work just shows that these are not radical ideas, but important areas of criminal justice that must be explored," says Stewart. ●

Putting the play into playgrounds

By Lorraine Chan

Herrington says there needs to be less obsession with safety.

©istockphoto/MichelleSibrian

A child running through grass or mixing mud pies is doing a lot more learning than first meets the eye, according to UBC researcher Susan Herrington.

In fact, Herrington says that more outdoor play spaces need natural elements and parts that children can move around and interact with to enhance physical and cognitive development while stimulating imaginative play and empathy.

"Children learn by doing and it's a really important phase of development for kids being able to manipulate their environment, which is something they're often protected from now," says Herrington, a professor in the School of Architecture and Landscape Architecture, Faculty of Applied Science.

Herrington has been studying children's outdoor play spaces since the 1990s. In Canada where more than half the children up to age five are enrolled in some form of child care, Herrington says there needs to be less obsession with safety and more awareness of designing spaces that foster development.

Between 2003 and 2008, Herrington conducted a study as part of the Consortium for Health, Intervention, Learning and Development (CHILD), which comprised teams of academic researchers and community professionals from across B.C. and was funded by the Social Science and Humanities Research Council of Canada. Herrington compared the outdoor designs of 16 licensed child care centres from various socio-economic locations across Vancouver.

These centres had children aged two to five, the age group that makes up the largest population of children at most child care centres in B.C. and across Canada.

Herrington discovered that children are more likely to verbally interact with each other and their early childhood educators when their play engaged living things such as plants, animals and insects.

"We found that outdoor play spaces that contain materials that children could manipulate—sand, water, mud, plants, pathways and other loose parts—offered more developmental and play opportunities than spaces without these elements."

The study also shows that the child care centres' play equipment was often the most expensive item in the play space but did not fully engage the children. Typical of such equipment are brightly coloured plastic picnic tables or a prefabricated module with climbing area and slide. Herrington analyzed a random sampling of video clips documenting children's use of their play space. Her results showed that the equipment was unoccupied 87 per cent of the time.

During the 13 per cent of time when children were playing on or around the equipment, only three per cent of the time represented its intended purpose, for example, going down the slide.

"The children were either sitting beneath the equipment, or in one case, a little boy was dropping pea gravel down the hole of one of the support poles."

But worse than boredom is overcrowding in outdoor play spaces. "We know from decades of research that when outdoor play spaces exceed their densities, there is more aggression between the children," says Herrington.

In British Columbia, child care regulations require seven square metres of outdoor space per child enrolled full time. This is the size of one half of a parking stall.

"It's ironic that in Vancouver we require 14 square metres for each parking stall so when you think about it, we provide our vehicles more space than our children. ●

What does work for children's outdoor play space?

Landscape Architecture Prof. Susan Herrington has found that children enjoy environments where:

- they had elements for children to manipulate and make their own;
- they contained living things;
- they were sensitive to climate;
- they were designed to the scale of the child;
- they allowed the child's imagination to shape the play experience; and
- they provided areas for children to play alone or in groups.