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SKILLS TRAINING, EDUCATION & TECHNOLOGY

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All the Kids on Builder Street illustrates benefits of construction careers

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A new colouring and story book features children sharing stories about people they know who work in the skilled trades with the goal of teaching youth about the career opportunities that exist in the construction sector.

All the Kids on Builder Street is the first in a five-part series that aims to educate and promote the importance of skilled trades to students from kindergarten to Grade 8.

"The book has kids talking about all their family members and friends who work in the different trades," explained Jamie McMillan, co-author of the book and founder of KickAss Careers. McMillan is also an ironworker, boilermaker and professional speaker.

"The message is that knowing all these people helps them understand how everything is made."

KickAss Careers raises awareness and promotes careers in the mechanical, industrial, technology and construction sectors through school and community outreach. It touches on everything from the tools to "white hat" positions.

"As a professional speaker and advocate, it is important to have a book or information available for your audience," said McMillan.

"Through KickAss Careers we have postcard flyers and hard hat stickers but we wanted something that would engage the younger generations when promoting pathways in skilled trades and tech."

Finn Pette, an artist, millwright and stationary engineer, wrote the first draft of the book and McMillan and Pat Williams, McMillan's business partner at KickAss Careers, finalized the "script." Williams is also a stationary operating engineer and a skilled trades advocate.

When McMillan and Williams began working together in 2014, they spoke about her idea of a colouring book.

In 2016 they asked Pette if he would be interested in helping out. They each came up with a few different ideas but Pette's script was "hands down the best of all," McMillan noted.

"Our purpose is to have the book recognized by educators and industry across North America as a great resource/education material for children to learn about the vast career opportunities in the building and construction industry," said McMillan, adding skilled trades need to be taught in schools. The book is written in English, Spanish and French.

"Our goal is to sell and partner with educators and industry to have our book and its upcoming editions reach the hands of every young student across North America over the next five years."

The team wanted to present the information in a modern way that would be appealing to young people.

"I wanted to do an updated version of the 1986 book published by Tradeswomen Inc. for many years to advocate to younger children the importance of skilled trades and teach them some basics about what we do through fun cartoon-type images," added Williams.

"By interacting with the pictures in a positive way it will help give children a positive feeling of skilled trades. It should also encourage dialog with adults about the positive aspects of skilled trades including the tasks, apprenticeship-style education and monetary gains."

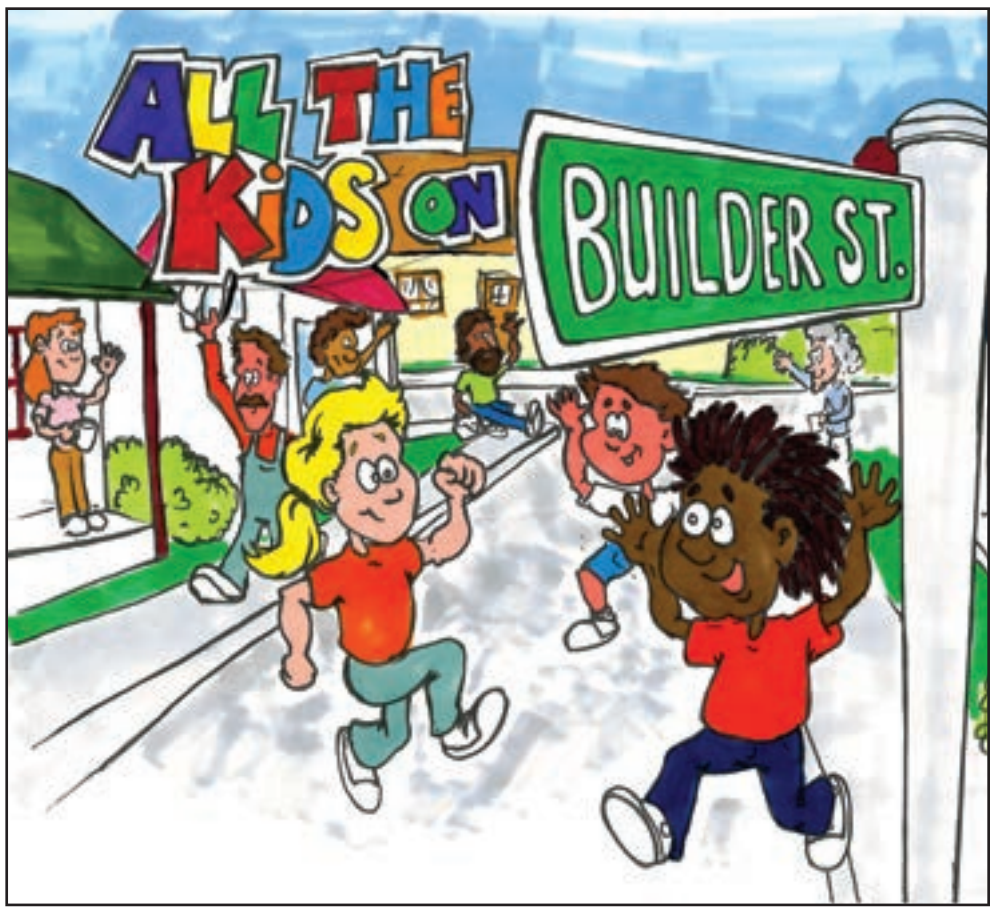

PHOTO COURTESY KICKASS CAREERS

The All the Kids on Builder Street colouring and story book is the first in a series of five educational and promotional books geared at informing youth about opportunities in the skilled trades.

When asked what some of the challenges were in putting together the book McMillan said, "Choosing which trades to use and finding an artist who is familiar with those trades and tasks so the cartoons are authentic. We also had our own life circumstances over the past two years that at times made it difficult to meet deadlines."

The book can be ordered for $5 plus shipping through patjwillimas4@aol.com in the U.S. and jiw.life@gmail.com in Canada.

The group is also hoping to have it available in an online store on its website, www.kickasscareers.org, in the near future.

Technological innovation changing range and type of on-site services

PETER CAULFIELD
CORRESPONDENT

Technological innovation is taking the construction industry by storm. Everywhere you look, digital devices of some kind are changing the way construction gets done, both on-site and behind the scenes.

Vancouver construction innovation consultant Helen Goodland says much of this technological disruption has caught the industry by surprise.

"I once heard someone say that construction moves forward by looking in the rear view mirror," she said.

"Chances are we won't see the disruption until it's suddenly everywhere. So the companies that will have the most impact are not actually construction companies in the traditional sense, they will be tech firms or come suddenly out of left field."

Clint Undseth, vice-president innovation of Stuart Olson, says his company is in the information management business, "not, strictly speaking, the construction business."

"We're using more and more digital tools for such functions as integrated scheduling, mobile connectivity and automated commissioning," he said. "And we're testing virtual reality and looking at using drones for site security and tracking project progress."

More technology means some people will be reallocated from on-site work, says Undseth.

"The goal is greater productivity and sustainability," he said. "More trained and specialized people will be needed in front-office functions but fewer for on-site services."

A partial list of on-site services includes on-site and access road building; site preparation and rehabilitation; scaffolding; site security; portable toilets; temporary offices, lodging and catering; and post-project landscaping.

Lean construction, a construction system promoted by the Lean Construction Institute (LCI) in the U.S., is being used by Kinetic Construction Limited in B.C.

Mark Liudzius, vice-president of Kinetic and Victoria branch manager, says lean construction reduces waste and re-do.

"It enables us to get the team together sooner, so we can spend time on up-front planning, instead of on cleaning up errors later on," he said.

According to LCI, lean construction "seeks to develop and manage a project through relationships, shared knowledge and common goals.

"Traditional silos of knowledge, work and effort are broken down and reorganized for the betterment of the project rather than of individual participants."

Kinetic is using lean construction principles to build a 102-unit affordable rental housing project for the Greater Victoria Housing Society in Colwood, B.C. When it is completed, the structure will have all of the latest environmental bells and whistles.

Designed to Passive House standards, the building is expected to exceed the B.C. government's Step Code 3 and it will produce zero net-carbon-ready emissions.

Liudzius, says that in line with the principles of lean construction, Kinetic is using prefabricated wall panels on the project.

"Pre-fab is a great example of lean construction," he said. "It really speeds up the framing process. It takes less than one-half of the time of conventional framing."

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Revealing the mystery of modern trades training

LINDSAY LANGILL
SPECIAL TO THE JOC

This is the first of a series of articles exploring the mystery and history behind trades training and how it has evolved over the years to what it has become today. The entire series can be found online at www.joconl.com.

For centuries knowledge has been passed down from one generation to another.

Whether formally or informally much of what we know has been learned from others.

Trades training has relied on this method of knowledge dissemination for centuries.

The Roman Empire valued the skills and high standards of workmanship that enabled the empire to build and conquer during a time when "all roads led to Rome".

Similarly, Europe positioned itself with men and women of skill well in front of the Industrial Revolution by advancing trades training mainly through apprenticeships. As de la Croix argued, Europe was set for a successful Industrial Revolution because centuries prior skills were being taught that saw skilled workmen mature through the system.

As de la Croix and other researchers have observed, without the workmanship of skilled craftsmen who could turn blueprints into working machines and could scale up models, the insights of the giants of the Industrial Revolution would have been as economically inconsequential as Leonardo da Vinci's brilliant technological sketches.

English ironmasters such as John Wilkinson were indispensable to inventors such as James Watt and Samuel Crompton. Tradespeople turned inventors' ideas into reality and helped bring about the Industrial Revolution.

In connecting skilled trades workers with the inventors — a marriage of the skilled doers and the innovative thinkers gave rise to a system of training and apprenticeship that became the backbone behind advancing a nation.

Apprentice training within Europe advanced through four institutions and similarities can still be found today within our modern apprenticeship system.

The Family

In the 11th century, historical documentation shows certain skills, crafts and trades were part of European family tradition; skills typically passed down from father to son and mother to daughter. Certain families had monopolies on specific trade work as "skilled families of artisans" emerged. Towns and cities where this practice existed typically had slower growth as dissemination of knowledge was slow to expand outward. One risk associated with this model was if no son was born or should a single family member die before his/her time, this knowledge would die along with the family.

The Clan

There is a saying that there is power in numbers and larger family units provided greater success when knowledge was to be shared. These family units or clans were able to provide the apprentices with greater exposure. Not only did more opportunities present themselves but a greater number of apprentices were put to work alongside a number of skilled artisans. While the knowledge was kept in the family clan, the dissemination of knowledge transfer was greater and influenced a wider geographical area.

Guilds

The earliest documentation indicates guilds had their beginnings in the Roman era with merchants forming consortiums to oversee and control business. While these collapsed after the fall of the Empire, the structure of the guild was brought back in Europe during the High Middle Ages (1000 -1250 AD).

Early guilds saw European craftsmen form associations based on their trade. Masons, carpenters, metalworkers and other artisans would form separate associations where they shared and controlled the secrets of their trade. Besides controlling the trade knowledge, they also controlled price. The founders of the guilds were master craftsmen who then went about hiring apprentices to work and learn the trade.

Apprentices completing their time in the trade moved on to be recognized as a journeyperson.

Once a journeyperson, the next step to master craftsman meant producing a "masterpiece" that would be accepted by the guild founders as being a piece of original work that was completed to the highest standards. Should the journeyperson fail at this attempt he would remain a journeyperson for the rest of his life. The guild model provided apprentices with even greater exposure to work, knowledge and skills as they were surrounded with a structured system guided by the best specialized trades workers.

Free Market

The free market is very similar to what we

see today where apprentices move and work in the free economy. Operating as independent contractors, these skilled workers moved about, set their own rates of pay and took on work on their own terms.

During the pre-industrial revolution period the free market institution made it possible for apprentices to move about and learn from the best masters.

According to Maddison (2010), knowledge was disseminated the fastest through this institution without being constrained by the anti-competitive and controlling aspect of guilds. This model allowed journeymen to work in unrestricted environments resulting in the expansion of knowledge in Europe and beyond.

Today

In days gone by, an apprentice would carry out his/her learning in a factory or on the job. No time was spent in school.

Today, apprenticeship training combines on-the-job training with in-school technical training. While there are varying differences of training models throughout Canadian jurisdictions the core premise remains the same. Guided by Red Seal standards apprentices follow the agreed upon principles and outcomes.

Within most provinces, technical training is carried out by public and private training providers alike. British Columbia has 15 publicly funded trades training schools located across the province and additionally, there are more than twice as many private schools providing trades training.

While a few of the private schools are completely neutral in enterprise, the majority of the private trainers are union schools. These schools focus on one trade or a group of similar trades.

Admissions to public training schools are open and available to any registered Canadian apprentice. However, union schools typically restrict admission to registered apprentices from their member companies.

Apprenticeship has been the proven model of knowledge transfer for trades spanning more than 1,000 years. The success of the Industrial revolution can be attributed to the European apprenticeship system, and the skilled workers that were able to create, build and innovate.

Truly the strength of the system is in exposing the apprentice to as many tasks and skilled mentors as possible — to learn from many.

Further, time in school, must be provided using the best equipment, challenging instructional best practices, and learning from each other. The modern day apprenticeship system is still proudly in the business of knowledge dissemination for skilled trades.

Dr. Lindsay Langill is a former dean of trades and technology. Langill holds Red Seal certification in three trades and has a Bachelor of Education and Master of Arts from UBC along with a Doctorate from the University of Calgary. He is president of 3-Degrees Consulting Ltd.

Technologies help reduce required number on-site workers

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It also requires less on-site labour — a crew of eight compared to a crew of 20.

"Fabrication takes place off-site with specialized workers in a dry, warm and safe environment," said Liudzius.

Another technology that reduces the need for on-site workers is Multivista Construction Documentation. Multivista was founded in 2003 by a B.C. electrician,

A spokesperson for the Vancouver Island based company says Multivista combines photography, video, webcam, UAV (unmanned aerial vehicle), 3-D (three-dimensionality) and 360-degree capability to create interactive as-built records of a construction project. The company takes architectural drawings, documents them and uploads them to a cloud-based platform. This then enables collaboration among all the team members on a construction project. Everyone on the team gets to see the same thing, allowing more to be done by fewer people.

While there will be fewer on-site construction services required in the future, they are certainly not going to disappear from the map.

"All civil work has to be done on-site — foundations poured, holes dug, that sort of thing," said Nate Bergen, operations manager, Seagate Structures Limited in Langley, B.C.

A specialist in light wood frame and mass timber structures, Seagate installed all of the pre-fabricated wood at the University of B.C.'s tall-wood Brock Commons student residence project.

"You'll always need somebody to connect all the different pieces of a project and that work has to be done on-site," Bergen said. "And the amount of pre-fab that can be done will be limited by distance and transportation requirements."