



The EU Framework Programme
for Research and Innovation

HORIZON 2020



First International Workshop in Rome, 5-6 December 2016

Fab-Labs and the Maker Movement: A Promising Approach for Lagging Regions?

Nico Calavita, Professor Emeritus
Graduate Program in City Planning
San Diego State University

An Unwelcome Exodus

By QUOCTRUNG BUI

This year's election has forced Americans to take notice of class divisions between workers. Many of the most skilled workers, young people with college degrees, are leaving struggling regions of America for cities, specifically for cities in Southern and coastal states.

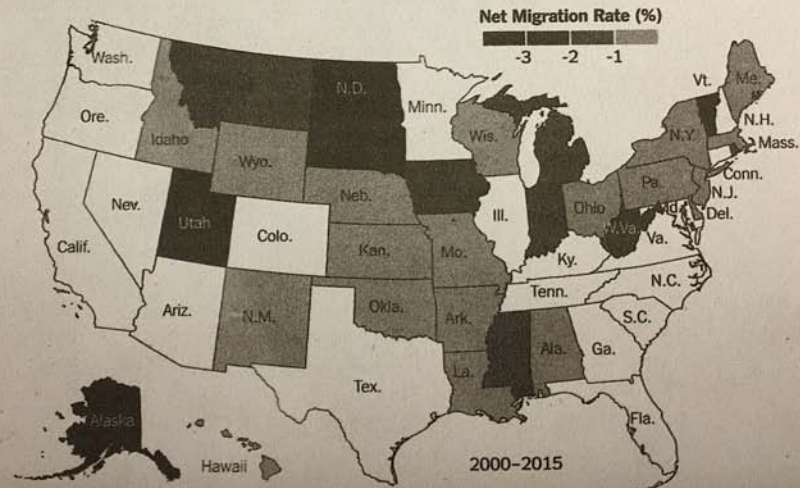
There are clear economic reasons for their choice. Dense metro areas tend to produce more jobs and make workers more productive. Wages, for all kinds of workers, are also higher. In theory, these incentives should prompt workers of all levels of education to move to metro areas. But moving outside one's region is relatively rare these days, and even rarer for someone without a degree.

The United States has had one of the highest rates of internal migration among advanced economies, and that has been the case since at least the middle of the 19th century.

After World War II, more people began moving outside their local region, particularly to

States That Have Tended to Lose College Graduates

Net migration of college educated people under 40



Note: Those who grew up in one state, went to college in another, and then moved again are counted as migrating from the state where they attended college.

NY Times article. Nov. 24, 2016
“Without jobs to offer, luring young college-educated people is hard. At the same time, it’s hard to create jobs without a college educated labor force....It’s really a chicken and egg thing. Economist Stuart Rosenthal – Michigan State University

Maker Movement: What is it?

It has been characterized (Shrock, Marotta & Heying, 2016) as:

- An entrepreneurial practice that can catalyze local job growth
- A human-scale, localist alternative to neoliberal capitalism & globalism
- A resurgent form of urban manufacturing that integrates design with production
- An opportunity to engage younger generations around science and technology skills

How does it work?

Inventors, artisans, artists, tinkerers and thinkers come together to:

- Experiment, build prototypes, invent, make;
- Take advantage of low-cost, ubiquitous, technologies with shared access, such as 3D printing and personalized computer numerical controlled (CNC) tools;
- Collaborate through sharing and informal networks

Makers can evolve into:

- Incubators of new business, by accelerating ideas and bringing them to market
- Shared-based models of incubators and accelerators to get start-ups off the ground

Example: *Kitchen Cru* in Portland

Challenge: No existing model for business specific to food industry start-ups



Not many differences between

Maker Movement
Public accessible
places to design and
create (2005)

- Fab Labs MIT
2001 Media Lab
Community emphasis



Welcome

Membership

Classes

Events

Facilities & Amenities

TechShop Locations

Equipment Reservation
Calendars

Services & Programs

FAQs

TechShop News

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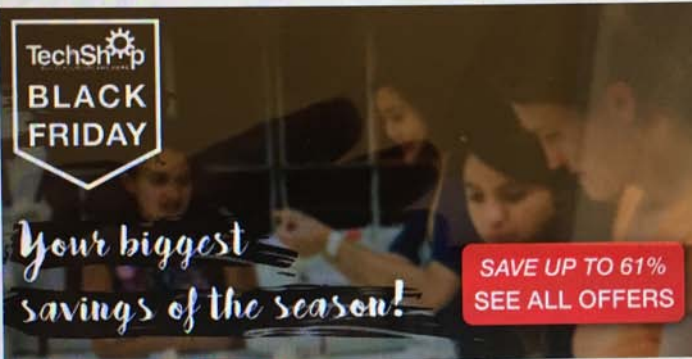
Contact Us

Job Openings

stay in touch



Promo



TechShop® is a vibrant, creative community that provides access to instruction, tools, software and space. You can make virtually anything at TechShop. Come and build your dreams!

A playground for creativity, TechShop is an open-access, DIY workshop and fabrication studio. We are a community-based space where entrepreneurs, artists, makers, teachers and students come together to learn and work together.

What We Offer

TechShop provides access to instructional classes, events, and over \$1 million worth of professional equipment and software at each location. Each of our facilities includes laser cutters, plastics and electronics labs, a machine shop, a woodshop, a metalworking shop, a textiles department, welding stations, class and conference rooms, and much more. Members have open access to design software, featuring the Autodesk Design Suite. Huge project areas with large work tables are available

Choose your store...

UPCOMING EVENTS

Pittsburgh, PA



Member Potluck
Sun Nov 27, 4PM

Online Webinar (Pacific Time Zone)



Investment Opportunity - Webinar
Presentation
Tue Nov 29, 12PM

San Francisco, CA



Date Night: Vinyl Cutting and
Heat Press
Fri Dec 09, 7PM

Austin, TX



TechShop Makerspace Academy
Tue Mar 07, 9:30AM

Chandler, AZ



TechShop Makerspace Academy
Tue Mar 21, 9:30AM

Arlington, VA

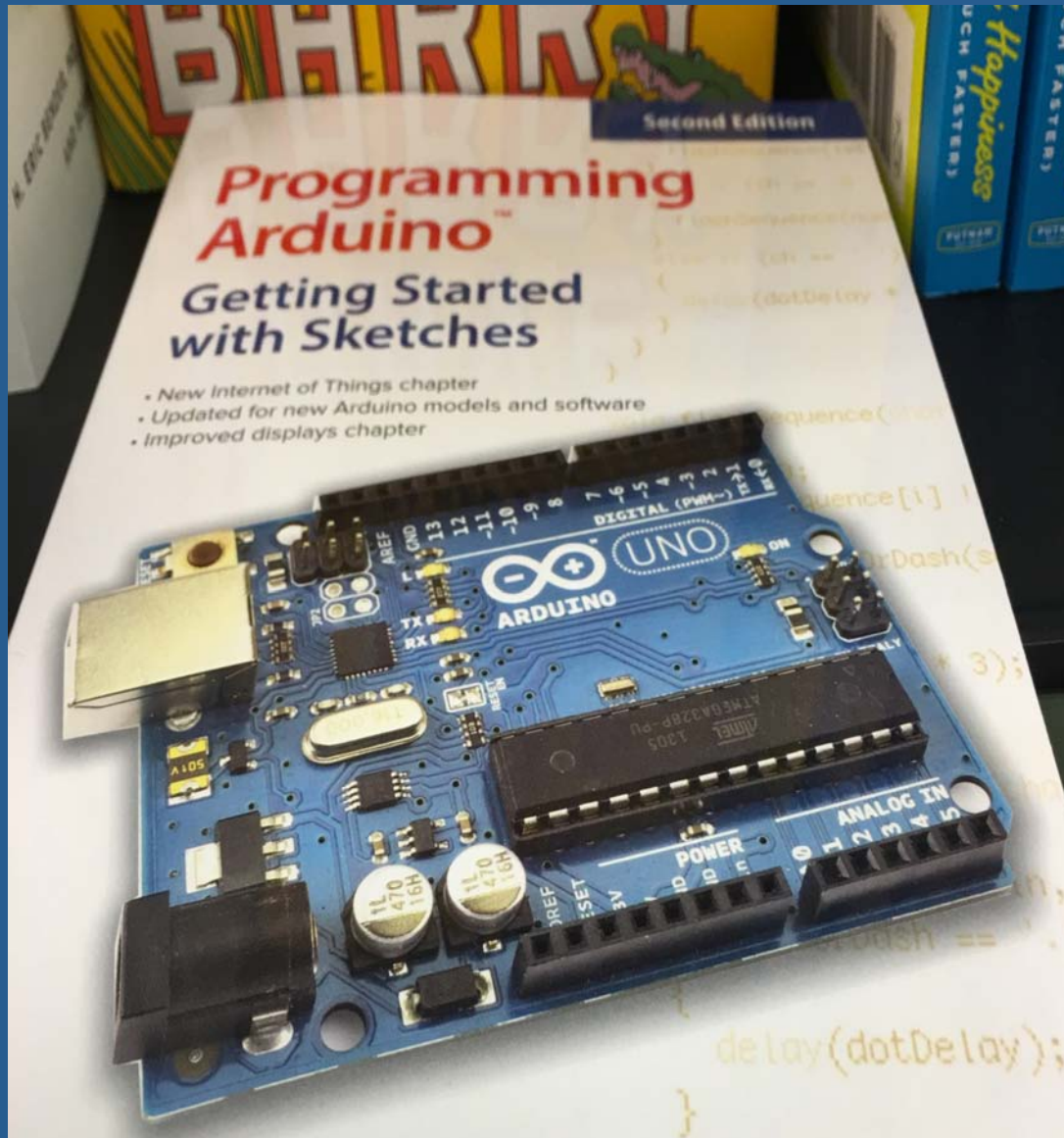


TechShop Makerspace Academy
Tue Apr 18, 9:30AM

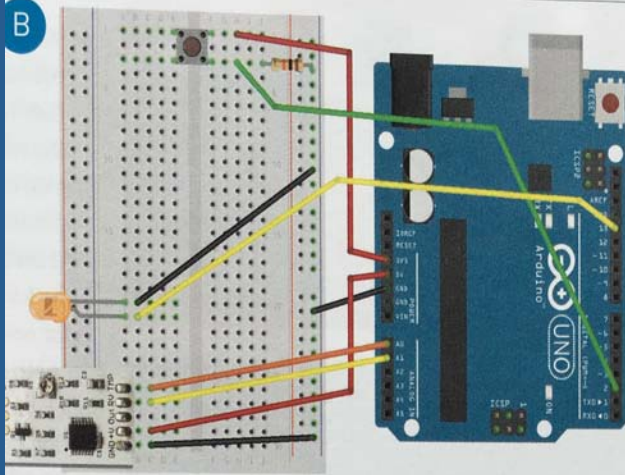
Mid Peninsula, CA

Nationwide open-access -- 2006
Trademarked places (Fab Labs as well)

The Arduino Board



Arduino is an open-source platform used for building electronics projects



HANDLE THAT

and I had started wind. Along y sensor that sensor is the

MOVEMENT

ng cups, wind. Another be to hang two nd detect when L circuit — ous cat.

the 5 pins that make the “header” to stick into the breadboard. (These header pins come with the sensor board.)

The hardest part of soldering is holding everything together while you actually apply the solder to the pins. But in this case, your breadboard can be your assistant. Just push the long ends of the header pins into the breadboard and place the 5 holes at the end of the wind sensor onto the short ends. To keep the board level, place a coin between the breadboard and the other end of the sensor board.

Then solder away, making sure none of the solder from one pin touches solder from another pin. Once you have the header attached, you’re good to go.

2 WIRE UP THE PARTS

Time Required:
1-2 Hours

Cost:
\$50 - \$60

Materials

» **Modern Device Wind Sensor**
\$17 from moderndevice.com/product/wind-sensor

You can buy the remaining items separately, or get them all in the **Make: Getting Started with Arduino Kit**, from makershed.com or Barnes and Noble stores nationwide.

» **Arduino Uno microcontroller board** To miniaturize this project, you could substitute an Arduino Nano or similar tiny Arduino-compatible board.

» **USB cable** for Arduino

» **Solderless breadboard, 10×30 size** or larger

» **Switch, momentary pushbutton** with 0.1" pin spacing, for plugging into a breadboard

» **Resistor, 10kΩ** This one has a brown-black-orange stripe pattern.

» **LED, generic** You can upgrade to a really nice flickering LED available from Evil Mad Scientist, item #408 at shop.evilmadscientist.com.

» **Jumper wires (10)**

» **9V battery pack with switch (optional)** or Arduino power supply



Peggy Acott



ADX IS A COLLABORATIVE MAKERSPACE AND FABRICATION HOUSE WHERE INDIVIDUALS AND ORGANIZATIONS COME TO MAKE AND LEARN. BY SHARING TOOLS, KNOWLEDGE, SPACE, AND EXPERIENCE, WE'RE DOING THINGS BETTER BY WORKING TOGETHER.

ADX Spaces



Consumers as investors – Produce and buy local



BY PROMOTING LOCALLY PRODUCED PRODUCTS, PORTLAND MADE AND MADEHERE PDX HELP MAKERS REACH WIDER AUDIENCES AND ALSO ENABLE THEM TO TELL THEIR STORIES AND ESTABLISH AN EMOTIONAL CONNECTION TO CONSUMERS.

its clients through the entire process of taking a new product to market.

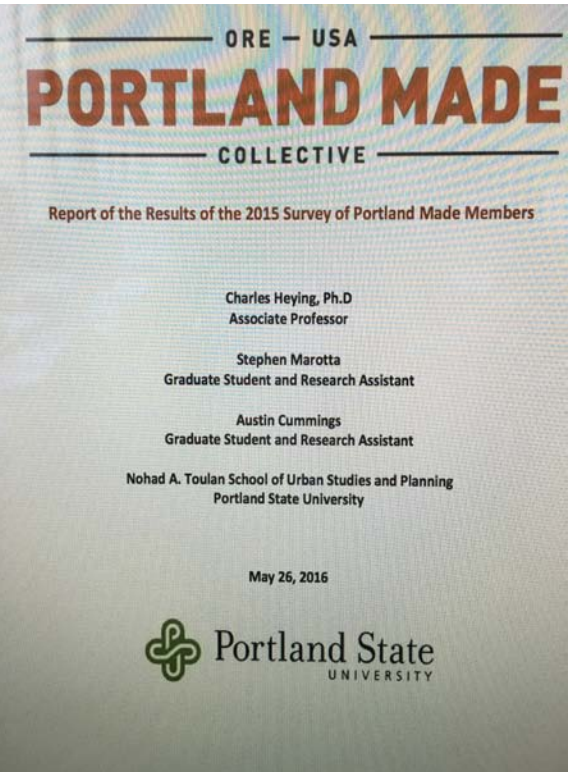
For makers who want to pursue the more traditional route of selling their goods through retailers in a brick-and-mortar space, there is no better place than the MadeHere PDX store in downtown Portland. With extensive experience curating the modern retail environment, MadeHere takes the pressure off makers by selling their wares for them.

A true celebration of Portland's maker scene, MadeHere PDX is dedicated to showcasing excellent craftsmanship and a commitment to quality. Interestingly, sales are about split between locals and out-of-town visitors looking to take a piece

PDX first opened, it had approximately forty vendors. By spring of 2015 that number had doubled, and it doesn't show signs of stopping anytime soon. Connor stresses that MadeHere PDX "wants to be a retail partner" with their makers to help them succeed. For some makers, this is their first foray into being in a retail location; Connor sees this as akin to a beta-testing experience—MadeHere is able to give makers specific feedback on their products based on what they hear directly and indirectly from customers. This can be extremely valuable to makers who have not had access to this kind of marketing and sales feedback before.

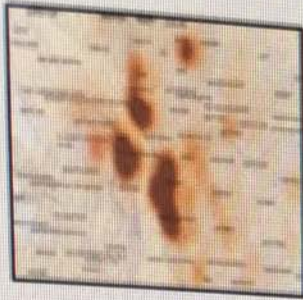
Produce and buy local

The traditional retail experience in which we bought things from local store owners who specialized in and curated quality goods suffered as cheap chain stores took over.



indicates that "Portland Made" has real meaning for members of the Collective. This affirmation of the local products within the Portland region. and 95% of all final product

Makers Love the Central City: Using an enhanced database with 476 unique street addresses, we created a *Makerverse* heatmap (left) that illustrates the intense clustering of makers and maker-enablers in the West End/Downtown/Pearl District, the Tillamook/Interstate Corridor including Mississippi Avenue, the Alberta Arts District, and especially the Central Eastside.



Makers Benefit from Clustering: The clustering of maker enterprises is a valuable asset for makers and maker-enablers as well as those who seek their products. In interviews, makers identified proximate access to the maker ecosystem as important for inspiration, problem solving, resource exchange, marketing opportunities, and a way to benefit from the collectively created Portland Made identity.

Portland Benefits from Maker Clustering: For locals and travelers who want to participate in the Portland Made scene, Portland's reputation for a vibrant street life and small scale accessible venues where artisan wares are produced and sold is an attraction and amenity that must be preserved.

Work Space Affordability Threatens the Makerverse: As anyone involved in the maker ecosystem knows, the Makerverse is under severe pressure from real estate development and urban growth.



PORTLAND STATE UNIVERSITY, UNIVERSITY OF
ILLINOIS AT URBANA-CHAMPAIGN, CITY
UNIVERSITY OF NEW YORK

The Maker Economy in Action

As a contributor to the hoped-for renewal of the manufacturing sector, the **maker movement** has commanded significant attention, from the White House and in city halls across the U.S. Our new research brief, funded by the **Ewing Marion Kauffman Foundation**, provides new knowledge about makers as entrepreneurs.

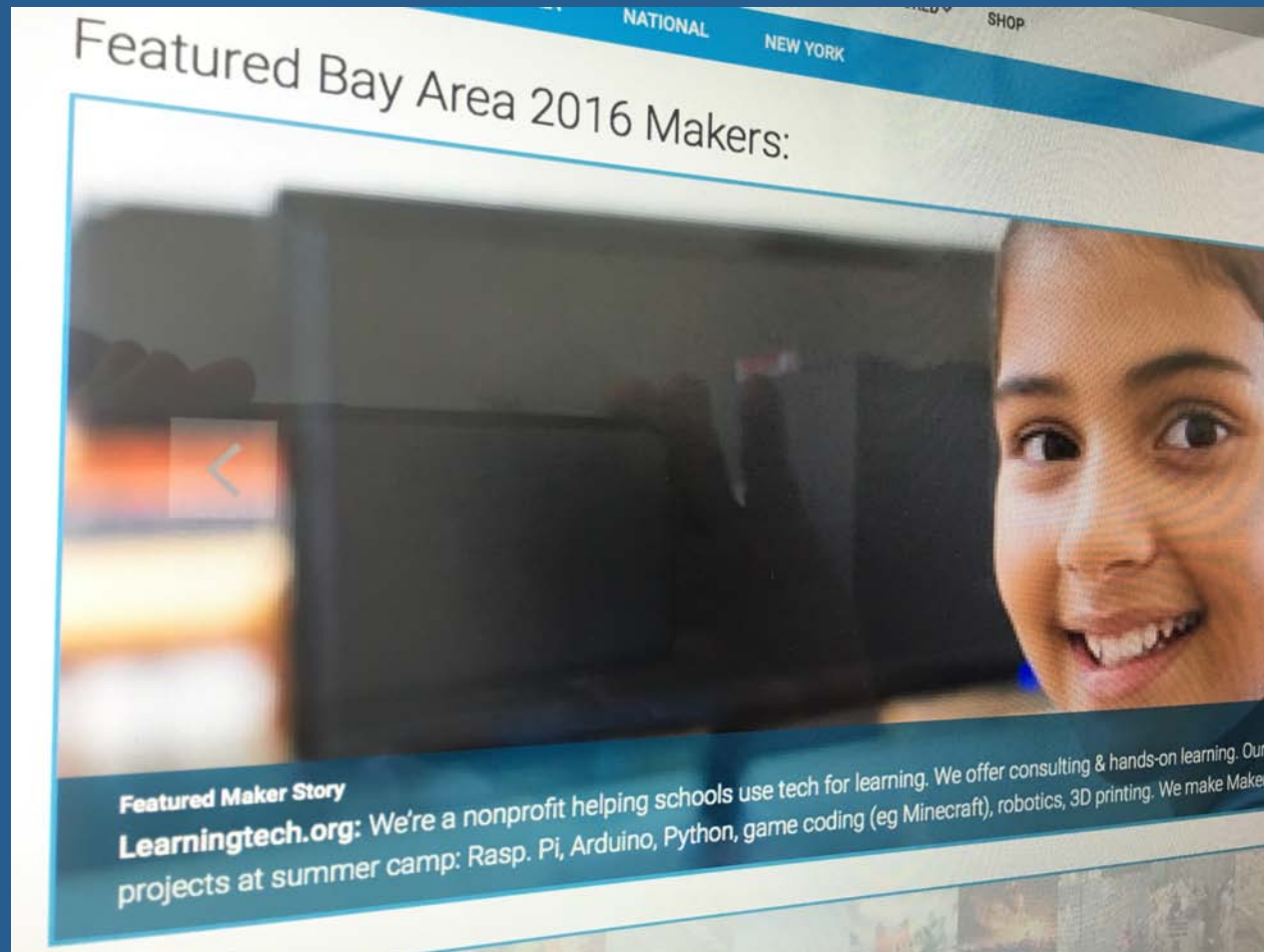
To capture the ways that makers build businesses in response to distinctive local opportunities and resources, we interviewed nearly 100 firms in New York City, New York, Chicago, Illinois and Portland, Oregon. Because maker-entrepreneurs draw on place-specific design, production, financing and marketing resources, we also interviewed more than 40 firms and organizations – public, private, and non-profit sector – that comprise the “maker entrepreneurial ecosystems” of those three cities.

[DOWNLOAD SUMMARY](#)

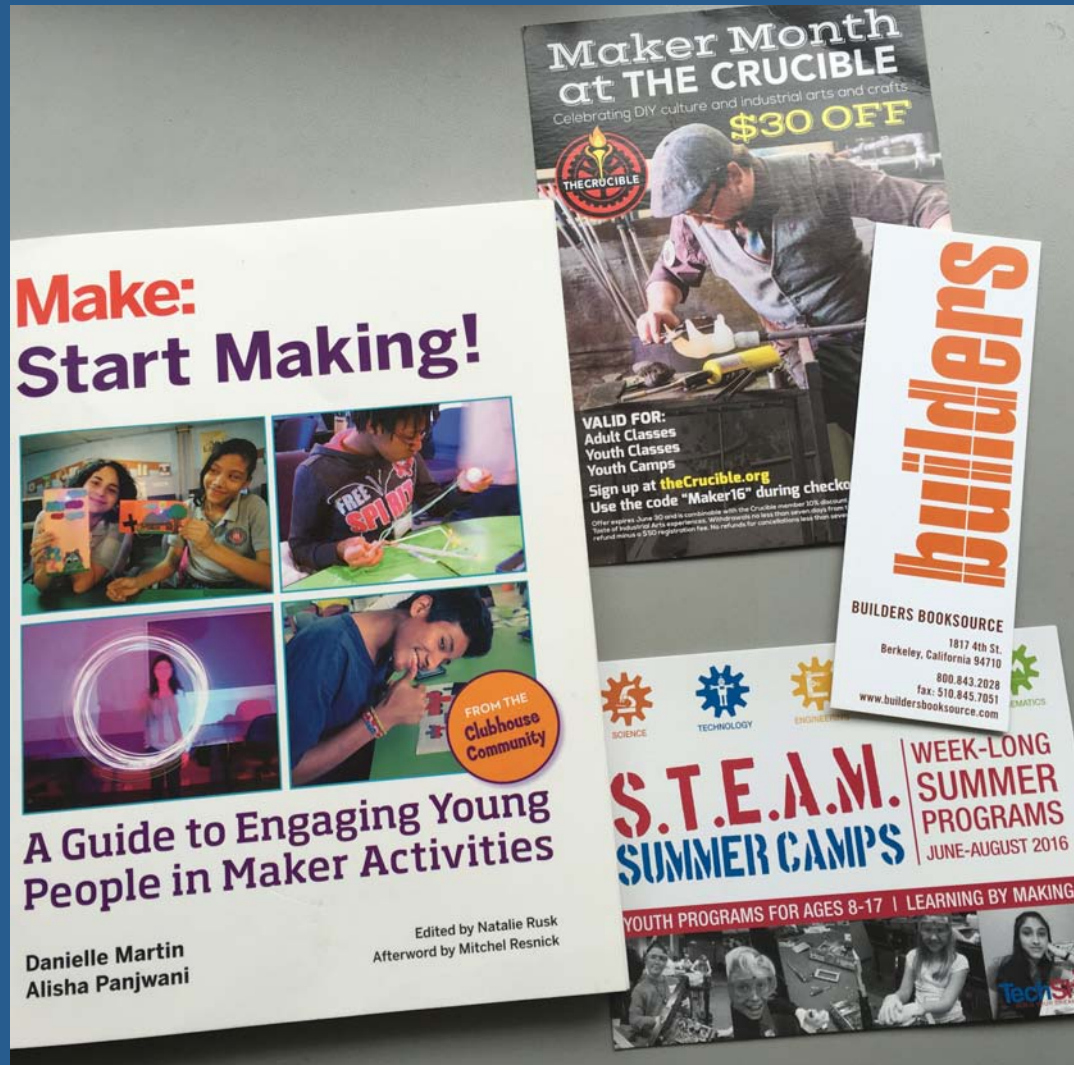
[DOWNLOAD FULL REPORT](#)

A makerspace is at the center of a web of creativity that includes academic, institutions, industry, museums, libraries, nonprofits and small businesses.

A teaching and training ground for the next generation of entrepreneurs, artisans and manufacturers



Non profits

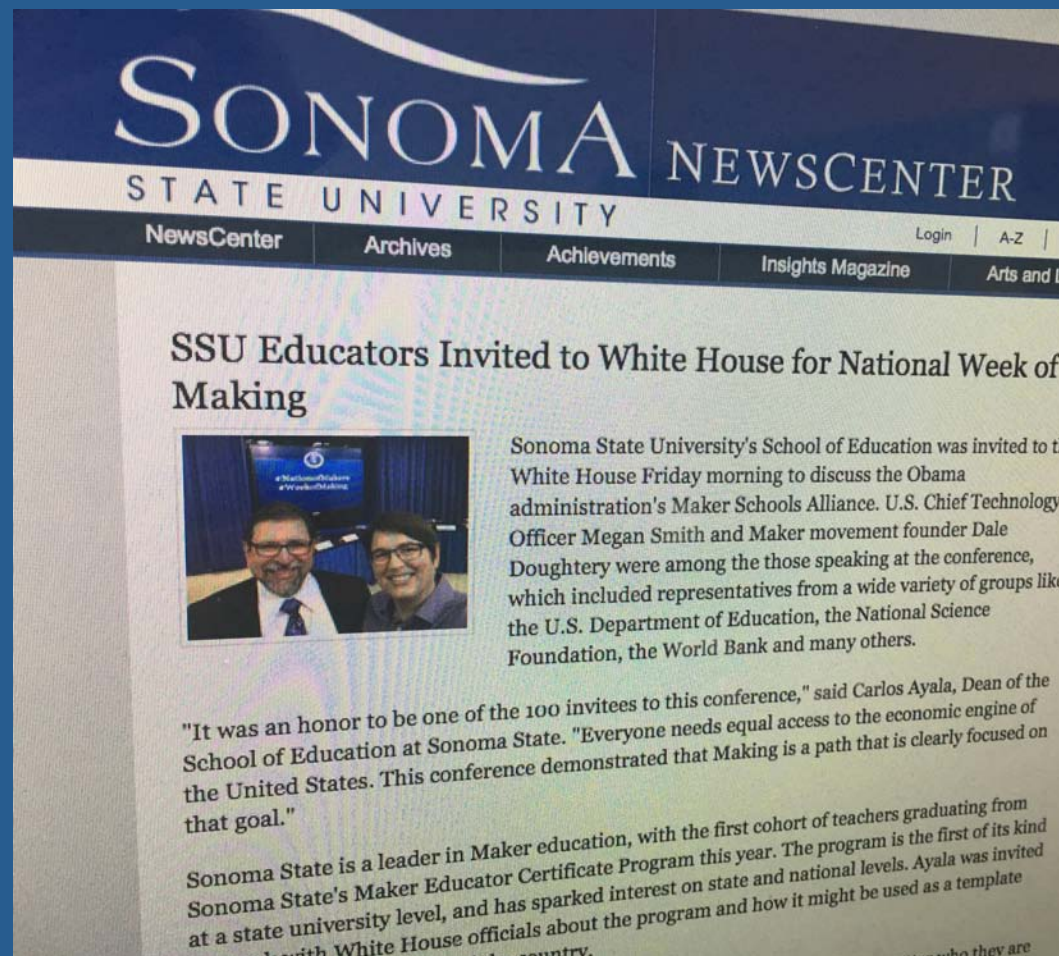


Richmond High School - California



Sonoma State's University *Maker*
Educator Certificate Program


Sonoma State's University *Maker Educator* Certificate Program



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SSU Educators Invited to White House for National Week of Making



Sonoma State University's School of Education was invited to the White House Friday morning to discuss the Obama administration's Maker Schools Alliance. U.S. Chief Technology Officer Megan Smith and Maker movement founder Dale Dougherty were among the those speaking at the conference, which included representatives from a wide variety of groups like the U.S. Department of Education, the National Science Foundation, the World Bank and many others.

"It was an honor to be one of the 100 invitees to this conference," said Carlos Ayala, Dean of the School of Education at Sonoma State. "Everyone needs equal access to the economic engine of the United States. This conference demonstrated that Making is a path that is clearly focused on that goal."

Sonoma State is a leader in Maker education, with the first cohort of teachers graduating from Sonoma State's Maker Educator Certificate Program this year. The program is the first of its kind at a state university level, and has sparked interest on state and national levels. Ayala was invited to speak with White House officials about the program and how it might be used as a template for the country.

... who they are

June 11, 2015

Presidential Proclamation -- National Week of Making, 2015

NATIONAL WEEK OF MAKING, 2015

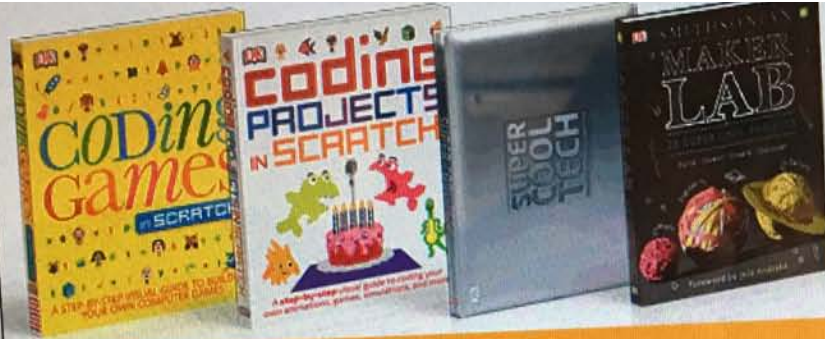
BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

American ingenuity has always powered our Nation and fueled economic growth. Our country was built on the belief that with hard work and passion, progress is within our reach, and it is because of daring innovators and entrepreneurs who have taken risks and redefined what is possible that we have been able to realize this promise. Makers and builders and doers -- of all ages and backgrounds -- have pushed our country forward, developing

My Administration is committed to spurring manufacturing, innovation, and entrepreneurship by expanding opportunities for more Americans to build products and bring them to market. Across the Federal Government, we are working to increase access to capital, maker spaces, and equipment to design, develop, and prototype ideas. By investing in regional manufacturing hubs, we are bringing together private industry, leading universities, and public agencies to develop cutting-edge technology and train workers in the skills they need for the next generation of innovation. To continue to build a Nation of makers, we are committed to engaging students at every level in the hands-on learning of science, technology, engineering, and mathematics (STEM) to inspire them

A makerspace is at the center of a web of creativity that includes academic, institutions, industry, museums, libraries, nonprofits and small businesses.



MAKE TODAY.
BUILD TOMORROW.



A WORLD OF IDEAS: SEE ALL THERE IS TO KNOW

Is It Time to Rebuild & Retool Public Libraries and Make "TechShops"?



Ken Oster used the Cincinnati public library's 3-D printer to create a custom bike pedal compatible with special shoes he wears because of a physical disability. Credit: The Public Library of Cincinnati and Hamilton County.

Maker spaces as part of of a new civic infrastructure?

Makers in bookstores

THE NEW YORK TIMES, SUNDAY, OCTOBER 14, 2016

BARNES & NOBLE

***** PROUDLY PRESENTS *****

OVER 2,500 MAKERS IN STORES NATIONWIDE

NOV 5 + NOV 6

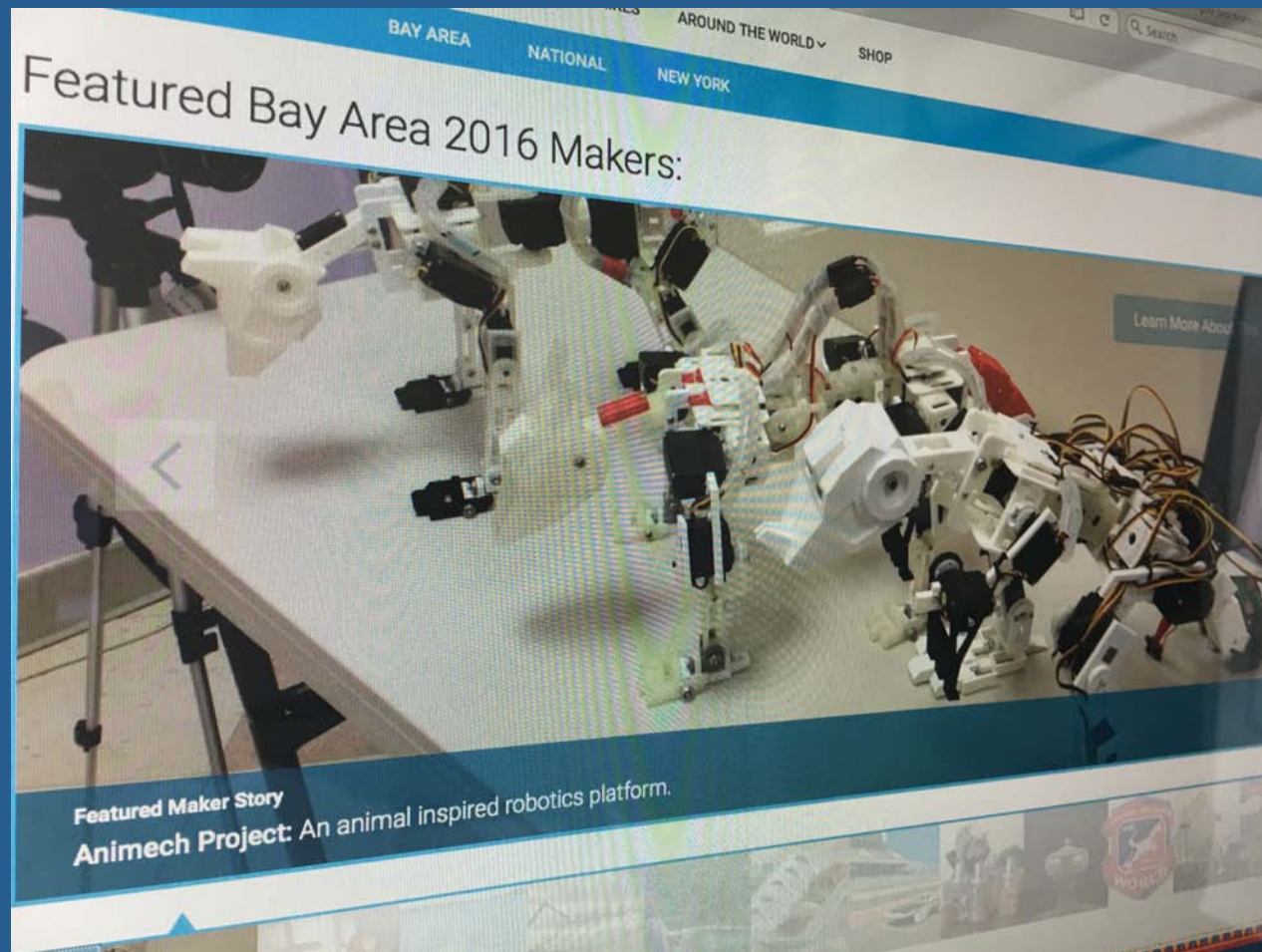
SCHOOL ROBOTICS TEAMS MAPMAKERS SCHOOL STEM/STEAM GROUPS
SCHOOL METAL & WOODWORKING CLUBS DALE DOUGHERTY EDUCATORS
EMILY COKER PROGRAMMERS AUTHORS DRONE BUILDERS TOOLMAKERS
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CHECK YOUR LOCAL
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OR FOR MORE INFORMATION, VISIT
BN.COM/makerfaire
[#BNMake2016](https://twitter.com/BNMake2016)



How can the maker movement help lagging regions?

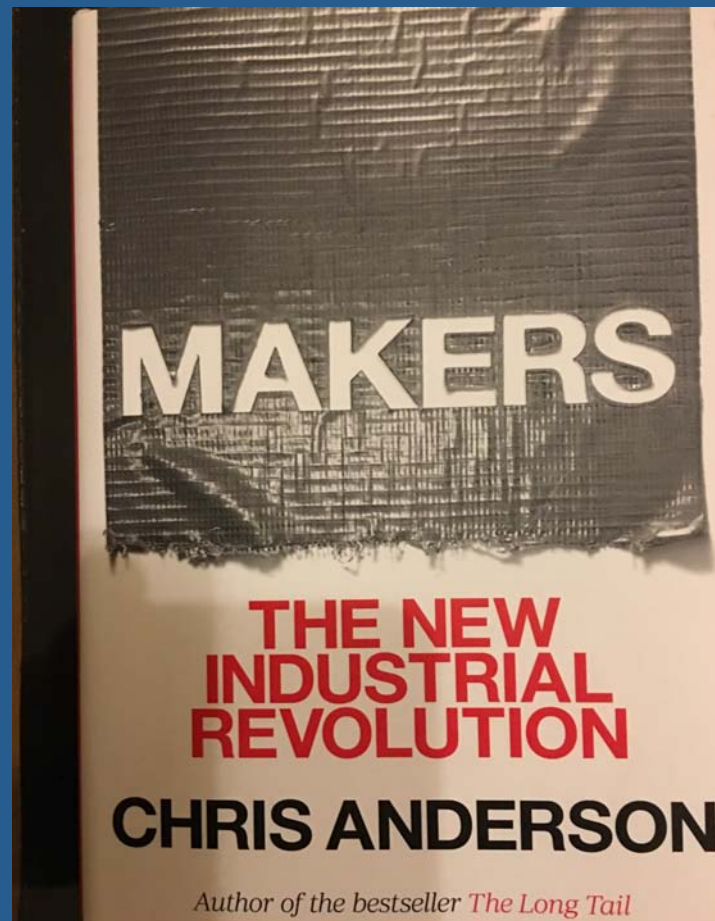


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- A resurgent form of urban manufacturing that reintegrates design with production
- An opportunity to engage younger generations around science and technology skills

A resurgent form of urban manufacturing that
reintegrates design with production



An opportunity to engage younger generations
around science and technology skills

Mind set to solve problems, in groups,
as part of a community of innovators

That leads to self-confidence, willingness to take
risks

From “learned helplessness” to “learned confidence”

Resilient personality

Thank You!