



Fellowship Final Report 2015-2016

Submitted by:

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Introduction

The Maker Movement is a subculture that pushes innovation to the limit, encouraging new applications of technologies. Within the culture there's an enthusiasm for invention, prototyping and applying practical skills in new creative ways. Makers want to figure out how to make or do stuff on their own, and with the democratization of the tools of innovation—they can. They have a passion for creating, building, and sharing in a gamut of topics including recipes, gardening, sewing, mechanics, and many more. Enter the opportunity for Extension:

We have the ability to apply a century of experience in these topics and connect with a thriving grassroots movement that is growing by leaps and bounds. Involvement in the Maker Movement is growing across the nation and Extension has an opportunity to engage with new audiences by applying the existing skills and knowledge found in the Cooperative Extension System.

The purpose of my fellowship has been to raise awareness of the Maker Movement while organizing Extension professionals and volunteers into a network dedicated to advancing and leading out in this new industrial revolution. I have done this at the county, state and national levels.

Mission

The mission of my fellowship was to “Build a network of Extension professionals and volunteers that actively engage in the Maker Movement.” In this first year I have grown the eXtension Maker Network to 84 members from 45 land grant universities by performing the following activities:

- Finding and connecting with Extension professionals already involved in the maker movement via Twitter, Google+ and Facebook.
- Sharing maker resources over the Twitter platform using [the hashtag #ExtMakers](#)
- Annotating [57 articles about the Maker Movement](#) via my public Diigo account:
- Hosting 7 Google+ Hangouts On Air about the connection between Extension, 4-H and the Maker Movement
- Publishing 4 articles in the Journal of Extension about the connection between Extension, 4-H and the Maker Movement http://www.joe.org/search-results.php?cx=010816128502272931564%3Aopgn_voyplk&cof=FORID%3A10&ie=UTF-8&q=Maker%20movement&sa=Search+JOE#1039
- Organizing 42 one-on-one video conference meetings with Extension professionals nationwide to answer their questions about the Maker Movement
- Reviewing Maker project instructions, adapting and providing advice for completing projects on a large scale i.e. 4-H camp setting
- Writing [a monthly blog post about the Maker Movement for 4-H.org](#)
- Attending the 2015 and 2016 Bay Area Maker Faires as well as setting up a booth at the Barnes & Noble Mini-Maker Faire in Saint George, Utah to engage local Extension clientele
- Representing 4-H at the [MakerEd Portfolio Workshop](#) about documenting Maker Projects in Palo Alto, California
- Representing 4-H at the [first ever Raspberry Pi “Picademy” in the USA](#) at the Computer History Museum in Mountain View, California
- Hosting an #EdTechLN Twitter Chat themed [“The Maker Movement and Extension”](#) with a national audience of Extension professionals

- Representing 4-H, Utah and the Cooperative Extension System as a [Maker Ambassador at the White House](#)

Maker Network Leadership

In addition to organizing the national Maker Network through eXtension, I also formed a national leadership team of six 4-H professionals from four states commissioned with identifying others involved in the Maker Movement within Extension. This leadership team has been my eyes and ears for the network and is largely responsible for the growth and diversity in our network. We presented together at the 2015 National Association of Extension 4-H Agents (NAE4-HA) conference in Portland, Oregon about “How 4-H can join the Maker Movement” to 33 other 4-H professionals. I also organized a statewide network in Utah as well as a local Maker Network in Washington County, made up of mostly volunteers.

At the county and state level we work together to identify sources for funding, write grant proposals, share ideas for maker projects as well as collaborate on maker camps and activities. Utah 4-H been successful in receiving funding for our maker programs from the State of Utah’s Department of Workforce Services and Cognizant, a Fortune 500 IT solutions company, in excess of \$1 Million over the past 4 years.

Plan of Work

Throughout this fellowship I hyper-focused on specific activities that would grow the Maker Network and provide value to members:

1. **Web Page** – I created extedtechs.org/makers to organize Maker resources for members i.e. books, sites, playbooks, tutorials, projects, courses.
2. **Membership** – I have connected with Extension 4-H professionals and volunteers actively involved in the Maker Movement. I have also identified professionals with skillsets that align with the Maker Movement and recruited them as community members. Reed’s law proposes that each new member of a network increases the reach of the network by an exponential versus linear impact. By regularly adding new members, the network not only adds them, but their connections as well.
3. **Twitter Engagement** – I have organized a steady flow of Tweets for the Maker Network to share knowledge and initiate discussion using the hashtag

#ExtMakers. I curate news and articles about the Maker Movement from weekly Google Alerts.

4. **Grant** – In 2015, [I was awarded funding in the amount of \\$25,000 from Cognizant](#), a Fortune 500 IT solutions company, for a Tri-County Maker Program I organized in Utah.
5. **Maker Faire** – I attended the Bay Area Maker Faire in 2015 and 2016 along with a Utah delegation of youth and adult volunteers. We taught soldering and sewing workshops to children in Cognizant's Young Makers' Tent.
6. **Conferences** – I attended NeXC in San Antonio, TX, NAE4-HA in Portland, OR, the Raspberry Pi Foundation's Picademy in Mountain View, CA, Maker Faire in San Mateo, CA, and MakerEd's Portfolio Workshop in Palo Alto, CA. At these conferences I had the opportunity to present and build the Maker Network, learn how to better utilize the open technology of the Maker Movement, and develop partnerships on topics like citizen science that could involve the the network.
7. **NeXC** – I assisted eXtension NeXC event organizers in providing a Raspberry Pi introductory workshop for conference participants in San Antonio, Texas.

Outcomes & Impacts

Based on the number of calls, emails and tweets I get, I think I have become the unofficial spokesperson of the Maker Movement to the Cooperative Extension System.

I was selected by the Senior Advisor of Making at White House to be a "Maker Ambassador" to represent Utah, 4-H, and the Cooperative Extension System. I attended the National Week of Making kickoff event at the White house and actively participate in a Slack channel, Facebook Page and conference calls with Maker Ambassadors from all 50 states.

Inspired and consulted with Missouri 4-H and Illinois 4-H in organizing, hosting a Mini Maker Faire.

Motivated and consulted Ohio 4-H, Virginia 4-H, Colorado 4-H, South Carolina 4-H and Oregon 4-H to organize 4-H Maker Camps statewide.

Presented [4 eXtension “Learn” webinars sessions](#) on the topic of the Maker Movement.

Published 4 peer-reviewed scholarly articles in the Journal of Extension.

1. [Extension and the Maker Movement](#)
 2. [4-H and the Maker Movement](#)
 3. *Building and Managing Makerspaces in Extension
 4. *The Internet of Things and Big Data: A Litmus Test for Extension?
- *Accepted for publication.

Increased the eXtension Maker Network to 84 members in 45 states.

Learned that the Maker Network preferred Google+ HOA's over Twitter Chats as a form of informal engagement.

Organized a USU Extension Raspberry Pi Workshop in Washington County, Utah using Lynda course curriculum, platform.

Facilitated sewing and soldering workshop at the 2016 Bay Area Maker Faire with Maker Network volunteers and 4-H youth.

Attended the National Maker Faire in Washington DC and met Dale Dougherty, the CEO of Maker Media. He agreed that 4-H is perfectly positioned to grow the Maker Movement across the country, especially in rural communities.

Organized and presented at the Barnes & Noble Mini-Maker Faire in Washington County, Utah. Participated in a pre-faire Twitter Chat with Ron Boire, CEO of Barnes & Noble (learned he raised beef in 4-H) and Dale Dougherty, CEO of Maker Media (learned that he worked for 4-H and raised his children in the program).

Selected by [MakerEd.org](#) to represent 4-H at the [2015 Portfolio Workshop](#) and share how 4-H has been recording youth projects for over 100 years.

Selected by [RaspberryPi.org](#) to represent 4-H at the first ever Picademy in the US. I became a [Certified Raspberry Pi Educator](#).

Instigated a Raspberry Pi Workshop at the National eXtension Conference (NeXC) and found local educators (GeekBus) to teach the workshop San Antonio, TX.

Presented on Maker Movement at NAE4-HA with National 4-H Maker Network Leadership Team.

Learned the Maker Network did not want new curriculum, just resources to existing curriculum and project ideas.

Created a Fellowship Project web page with resources for the eXtension Maker Network: extedtechs.org/makers

The Utah State University 4-H Maker Network wrote and submitted a Maker design challenge for 2017 National Youth Science Day (NYSD) call for proposals. Our Proposal was not awarded, but it was a darn good proposal!

Curated 26 YouTube videos on the [Maker Network Video Playlist](#).

Consulted with Tom Heck from MaKey MaKey on how to support Maker projects in 4-H nationwide.

Started the first ever 3D Prototyping 4-H Club in the world. The club is focused on mastering 3D modeling and printing. After “Working Out Loud” I inspired and connected with an Estill County, KY 4-H club leader who is adopting the idea and starting his own 3D Prototyping 4-H Club.

After “Working Out Loud” I became connected with Tony Roman with Wisconsin Extension and we are now in talks of planning to host a nation Extension Maker Conference.

I received the [Utah Governor’s Medal for Science and Technology](#) for work spreading STEM education through the Maker Movement in the state.

I was nominated by Jim Kahler, National Program Leader, STEM, Agricultural Science & Technology with 4-H National Headquarters, NIFA/USDA as a White House “Champion of Change” for my work in motivating 4-H programs across the country to join the Maker Movement.

Submitted measurable commitment-action statements to the White House for its [National Week of Making Fact Sheet](#). These actions are what the Utah 4-H program plans to do from May 2016 – May 2017 to progress the Maker Movement.

I accepted the the White House's invitation to celebrate the start of the [National Week of Making \(June 17-23\)](#) by attending the morning kick-off event in the Eisenhower Building as well as the National Maker Faire on the campus of the University of the District of Columbia. In this gathering I represented Utah (and 4-H, Cooperative Extension) as the White House OSTP organized the Nation of Makers events that bring together individuals from around the country who are leading efforts to empower, support, and inspire makers across the nation.

Make: Magazine [recognizes 4-H members](#) as part of the Maker Movement.

Conclusion

The Maker Movement is expanding from basements and garages to a global community. In fact, the White House even hosted its first Maker Faire in 2014 to raise awareness of the Maker Movement, and the President proclaimed June 18 as a National Day of Making. In 2016, June 17-23 has been designated as the National Week of Making. In the spirit of belonging, building, and sharing the things they're passionate about, the Maker Movement has emerged, giving voice and encouragement to all who seek to express themselves through the things they create. Extension has an opportunity to apply the skills and knowledge of the land-grant educator and volunteer network to participate in a meaningful way. I plan to continue leading the eXtension Maker Network because I believe this movement needs leadership and doing so will increase the visibility of Extension and deliver content to a new audience. I believe this effort will play a major role in helping Extension stay relevant in the 21st century.