Appendix A

eXtension and the For Youth, For Life Community of Practice

The Cooperative Extension System has formed Communities of Practice (CoP) around a variety of subject matter (or content) areas. University faculties from a majority of the 109 land-grant universities participate in the CoP's. The CoP's provide information and technical assistance to Communities of Interest - or the general public - through an electronic platform. This comprehensive approach of providing the best resources from the land-grant university system is known as eXtension (pronounced "e-extension"). An internet-based collaborative environment is provided by eXtension for land grant content providers (faculty) to exchange objective, research-based knowledge to solve real challenges in real time. It is a common online knowledge resource for the public. Multiple eXtension CoP's work together to provide a collection of live sites on a variety of subject matter. These sites offer credible expertise, reliable answers, creative solutions, customized answers to user needs, and more. See http://about.extension.org/ and http://www.extension.org/.

For Youth, For Life Learning Network (FYFLnet)

For the youth audience and the adults who serve them, a CoP called *For Youth, For Life (FYFLnet)* provides content and is designed as a learning network. "FYFLnet"—coordinated by Auburn University--consists of a *knowledge bank* of *eXtension* content pages designed for youth, high interest area *learning community sites*, a *secure online social learning network,* and *interfaces with social media* as appropriate. FYFLnet recognizes that learning among young people requires a multifaceted approach that involves knowledge but also means of engagement and collaboration. Therefore, it includes:

- The "knowledge bank" of ***eXtension*** content pages serves as the learning resource and is developed by a youth focused CoP made up of multiple content teams.
- Learning community pages are intended to be dynamic and engaging for the youth audience and relate to high interest areas. These community pages--or sites--also provide a way to share what is learned with others and contribute to a larger body of knowledge and experience.
- A private cloud or network will accommodate learners with a private learning space, a learning or e-portfolio to save or record work and accomplishments, and a secure social learning networking component to accommodate groups of learners.
- Interfacing with social media across these three functions will further build community among learners utilizing the For Youth, For Life Learning Network.
- Also see a blog site for an overview of FYFLnet; http://blogs.extension.org/foryouthforlife/join-our-team/ and a live content site at: http://www.extension.org/science_for_youth

The learning community pages, private network sites, and the interface with social media are all in prototype status with an expected launch in the near future.

Badging in 4-H and FYFLnet

Robotics is a high profile curriculum in the 4-H community across the country and is an excellent first project for which to develop badges. The Alabama 4-H program supports robotics for youth through a number of clubs and school-based settings where robotics kits have been placed. Young people learn about robotics through the Lego Mindstorm NXT Robotics resources through the Alabama 4-H robotics kits placements.

Auburn University would engage FYFLnet CoP members in the development of a mechanism for issuing and saving electronic badges—based on the attainment of skills and competencies-- as part of individual personal learning portfolios. A means of displaying badges in a presentable format for the learner and others would be a great feature as a new component or as an interface with another technology.

A critical component for supporting a "badging" function would be a collection of criteria and protocols for issuing of badges that would be common to the 4-H and the land grant community. Auburn will collaborate with the University of Nebraska-Lincoln as the content developers of the 4-H robotics curricula and other faculty from the land grant system to develop these aspects for a prototype. The FYFLnet, eXtension and Auburn are positioned to establish support for a badging service. A prototype would be a first step in the development and testing process with a focus on at least one content or subject area. The prototype would utilize the infrastructure of the Mozilla Open Badges project.

Although robotics content, staff, and electronic infrastructures are in place, 4-H is in need of collaborative efforts to assist in pulling all of the pieces together into a seamless, workable system to award multiple badges in robotics based on pre-determined criteria. This includes the front end loading of information through the final award of badges to the individuals who demonstrate competencies and skills.

FYFLnet Team Expertise (Auburn University Stage Two Team)

The AU based FYFLnet team will direct its expertise in developing a private cloud system for use by young people to include a badging component compatible with the Mozilla Open Badge infrastructure. Team members include faculty Drs. Tony Cook, Extension/Outreach Specialist and Assistant Professor, College of Education and Cheryl Seals, Associate Professor, Computer Science & Software Engineering (CSSE), College of Engineering; doctoral & masters level graduate students in CSSE and the College of Education. CSSE team members work in the area of human computer interaction (HCI) which will help in design of the system. An Information Technology Specialist in CSSE, graphic artists, and other staff will be called on as appropriate. The team utilizes a multi-server system in support of its private cloud environment and will dedicate server space for the badging system. The AU Stage Two team will also work with the Stage One team in development of 4-H badges especially on criteria for earning and issuance of badges in robotics.

In addition, expertise of the Engineering team includes Human Computer Interaction (design), system programming (development), web based development and usability evaluation. Among the team members there is technical expertise in the following languages/technologies: Java, JavaScript, HTML, Flash, HTML5, PHP, CSS, XML, Database and team members are versed in development in cloud-based environments and Adobe Captivate.

Further, the CSSE programming & outreach group (http://www.eng.auburn.edu/stars/) has been working with K-12 student and teacher groups since 2005 in the detailed training of K-12 students and their teachers to utilize Lego Robotics to learn introductory engineering and programming concepts (e.g. basics mechanical engineering principles and basic programming principles). This expertise should contribute to the overall 4-H Robotics Badge development process as well.