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The Iowa Cyber Hub: Protecting the Nation through Cyber Education



The Iowa Cyber Hub is dedicated to the continual improvement in the cyber security posture of the citizens of Iowa and the engines of economic growth and development for the State and region. This will be accomplished through a comprehensive set of literacy, training, outreach, and educational programs. By leveraging current initiatives and capabilities across the State as well as identifying and closing gaps the Iowa Cyber Hub is well positioned to make Iowa a leader in cyber security.

Started as a pilot project between ISU and DMACC, the Iowa Cyber Hub is designed to be the focal point for cyber security education, outreach, training, and foster additional interaction between the government, companies and schools through internships, training opportunities, and job placement.

Goal: The goal of the Iowa Cyber Hub is to create a safe and secure Iowa by delivering security literacy to all Iowans, providing educational pathways to grow the cyber workforce, and enhance the security capabilities to the benefit of the State, Region and Nation.

To accomplish this goal the Iowa Cyber Hub will create a cyber security ecosystem where companies can work with universities, community colleges, and K-12 institutions on cyber security issues with the goal of creating a larger cyber security workforce.

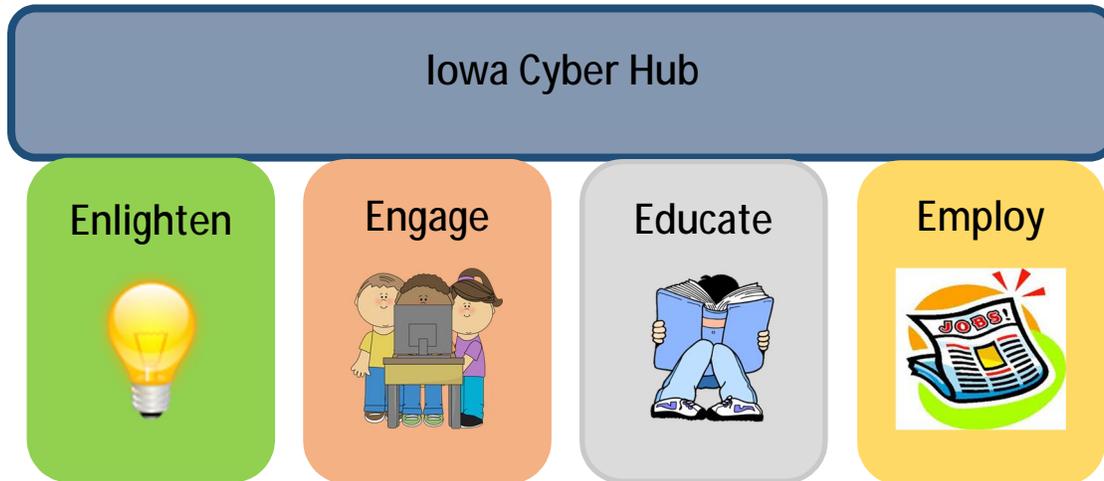
The Iowa Cyber Hub is aligned with the cyber security goals of the State of Iowa. In 2016 the State of Iowa released a cyber security plan with eight sections to address Executive Order 87

The Iowa Cyber Hub addresses recommendations from four of the eight sections described in the plan and as outlined below.

- **Section 4.3 Awareness Training:** Recommends a cyber security training environment to facilitate cross agency training
- **Sections 5.1-3 Public Education and Communication:** Recommends a cyber security literacy campaign for all Iowans, an annual cyber security conference, and cyber security literacy curricula and support materials for K-12 and college students.
- **Sections 6.1-2 Collaboration:** Recommends partnerships between educational institutions and the public sector, and cyber security training exercises
- **Section 7.1-3 STEM:** Recommends scholarships, pathways between educational institutions, and a review of workforce requirements.

4-E Model for creating a safe and secure Iowa

The Iowa Cyber Hub utilizes a multipronged approach in order to create a safe and secure Iowa and to address the cyber security issues of facing all Iowans. These issues include better user education, increased numbers of cyber security workers, robust training and cyber exercises, and enhanced partnerships between academia, industry, and government. Based on our long history and experience in working with our partners to advance cyber security efforts across Iowa we have developed a model based on four pillars that are needed to achieve the goals of the hub (Enlighten, Engage, Educate, and Employ), as shown in the figure below.



Four Pillars of the Iowa Cyber Hub

An overview of each pillar, the goals of the pillar, and current activities and future plans are provided below. Iowa State University and DMACC along with our partners have developed materials and methods for each pillar, however there are still gaps that need additional work. One of the primary outcomes of the Iowa Cyber Hub will be to identify and fill any gaps within the 4-E model.

Enlighten: For more than 25 years business, industry, government, and academicians have focused on using technology to address and resolve cyber security problems, however, cyber security issues cannot be solved by technology alone. Users must play a role in keeping themselves secure and safe. For the past ten years, Iowa State University has been working to change the discussion around cyber security from one where experts tell users what to do to a culture where the user is empowered to aid in their own security. The underlying strategy is that cyber security information can be provided in a way that enables the average user to relate to the basic cyber security concepts by using realistic, situational events allowing them to make informed judgements in their daily activities to protect themselves. By relating cyber security concepts in everyday terms and situations, people can think through a new situation based upon the concepts they acquired. There are two primary thrusts behind this pillar, enlightening K-12 students and enlightening all citizens.

Pillar Goal: The goal of the enlighten pillar is to expose all citizens to the basic concepts behind cyber security.

Outcomes: The Iowa Cyber Hub will work to:

- develop comprehensive security literacy program for all citizens
- deploy security literacy throughout Iowa schools
- partner with other state and national groups to develop best practices
- work with government and industry to identify or develop best practices for work place literacy
- Development of a cyber security essentials certificate.

Current efforts: Iowa State University has developed a robust set of security literacy curricular materials to teach students about security literacy (www.security-literacy.org). They have been providing materials so that all students can be made more literate and, therefore, be better able to protect themselves from cyber attacks. The literacy efforts currently underway span K-12 and even are used in post-secondary educational settings. We believe if this thrust of the pillar is correctly implemented we not only help students understand cyber security and the risks they take every day, but in addition we can get students to start thinking about pursuing cyber security as a career. By using the security literacy materials in the lower grades students are introduced to the idea that people work in this area, and as the students mature the workforce messaging becomes more focused.

Another aspect of the enlighten pillar is to provide security literacy to all citizens in Iowa. The Iowa Cyber Hub will develop the nation's first state wide comprehensive program dedicated to providing security education to all citizens across a state. The Iowa Cyber Hub will build off of these strengths to create learning materials that can be used to educate and train different audiences with different backgrounds. We will deliver the materials through various partner organizations like ISU Extension, 4H, SBDC, Iowa Law Enforcement, Iowa Area Educational Agencies, Office of the State CIO, Iowa National Guard, TAI, ICN, and Community Colleges.

Five year plan: The Iowa Cyber hub will over the next five years work to accomplish the following:

TBD

Engage: The engagement pillar is designed to provide opportunities for people (students, workers, citizens) to become involved in cyber security through training exercises, competitions, conferences, and training environments. One key aspect of this pillar is to provide opportunities for students that have shown some interest in IT and/or security to become involved with cyber security. These informal pathways will be based on the highly successful IT-Adventures / IT-Olympics program developed at ISU. We currently provide materials for high school students to work with local mentors with the goal of learning cyber security and participating in a state-wide high school cyber defense competition. Last year we had over 130 high school students participating in the statewide cyber defense competition.

Pillar Goal: To increase the number of students studying cyber security at a post-secondary school.

Current efforts: To be enumerated

Outcomes: The Iowa Cyber Hub will work to:

- Expand the engagement opportunities for grades 6-12
 - Expand the current high school cyber defense competition
 - Expand the high school cyber defense competition to the middle school through virtual competitions
- Develop a state-wide mentorship program to enhance linkages between industry and students
- Create state-wide cyber exercises for state and local government agencies
- Create cyber education materials to engage students in cyber security
- Establish a CTSO for cyber security

Five year plan: The Iowa Cyber hub will over the next five years work to accomplish the following:

TBD

Educate: Increasing the number of students who pursue a career in STEM has been a challenge across the country and there have been many efforts designed to address the issue. Iowa State University and DMACC, in partnership with industry, K-12 schools, other institutions of higher learning, and government, has been working for over 15 years to increase the number of students entering IT and cyber security. This pillar has three important components to provide the educational opportunities necessary for students to enter the cyber workforce. The first is to develop pathways for students through the various educational partners in the cyber hub. For example, working on pathways for students who enter a community college to continue at a 4 year school in cyber security. The second element of this pillar is working with the cyber hub and our employers to continue to align our curriculums to their needs. This involves alignment with NICE framework. The third is to provide formal educational opportunities for students in grades 6-12. In addition employer interaction like internships, mentors, and speakers is critical to develop a highly skilled cyber workforce.

Pillar Goal: To increase the number of students studying cyber security at a post-secondary school.

Current efforts: To be enumerated

Outcomes: The Iowa Cyber Hub will work to:

- identify educational pathways for students to study cyber security
- develop articulation agreements between educational partners and to share courses
- enhance the educational opportunities for the current workforce
- develop a set of uniform course outcomes to help employers
- develop scholarship and internship opportunities for students
- expand cyber security education into 9-12 grades and into post high school

Employ: The goal of the final pillar is to provide employment opportunities for the students. The cyber hub will work with regional employers and with various associations to help match students with employment opportunities. Currently employers recruit students through various career fairs held at each of the educational partners, which lead to duplication of effort.

Pillar Goal: To increase the number of students studying cyber security at a post-secondary school.

Current efforts: To be enumerated

Outcomes: The Iowa Cyber Hub will work to:

- develop standardize job postings and job descriptions based on the NICE framework
- develop cyber security employment opportunities
- align educational outcomes with employment opportunities
- facilitate industrial interaction to meet workforce needs (internships, job shadowing, etc.)
- organize a state wide cyber job fair

Structure of the Iowa Cyber Hub:

The Iowa Cyber Hub led by an executive director and will be organized into two layers as described below. The cyber hub executive director with input from the leadership committee will be responsible for the overall function of the hub, organizing the meetings, fund raising for support of the hub, and dissemination of the information and materials. Dr. Doug Jacobson will serve as the initial Executive Director.

Cyber Hub Leadership Committee

The Cyber Hub Leadership committee will be led by an executive director and will consist of a representative from ISU, DMACC, other community colleges, industry, government, and K-12. The makeup of the leadership committee and other governing documents are under development. The Leadership committee will form an external advisory group consisting of local and national leaders to provide guidance to the cyber hub.

Cyber Hub Members

Cyber hub membership is open to any group or individual interested in goals of the cyber hub. The ultimate goal of the cyber hub is to disseminate the information and materials to members. We will hold an annual meeting in the fall of each year with the goal of disseminating our information and materials. It should be noted that all of the materials produced in support of the cyber hub are available at no cost to the members, and that any new materials will also be released to the community.

The Iowa Cyber Hub has grown out of a long standing partnership between numerous organizations and groups that have been providing input and to helping deliver the programming necessary to accomplish the goal of creating a safe and secure Iowa. The figure below shows the breath of our current partners and the activities we conduct with each of them.

Educational Partners

High schools (> 100)
Middle schools (> 50)
Community colleges (10)
Area education agencies (3)
4 year schools (4 outside Iowa)

- Cyber security literacy
- Cyber defense competitions, cyber security playground
- Workshops and teacher / instructor training
- Summer camps, IT-AdventuresC
- Curriculum and articulation agreements
- Cyber security education pathways.
- Course sharing

Industry / Government Partners

National employers (> 10)
Regional employers (> 20)
Local employers (> 10)
State & Local Government
Trade Groups

- Provide scholarships, internships and employment
- Provide mentors for high / middle schools
- Provide support for cyber defense competitions
- Provide research opportunities
- Provide input into the cyber security educational programs

For more information contact:	Additional information:
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