

Proposal

LearnX

Digital Literacy resource matching
platform for disadvantage population



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Abstract

Digital or technological in competence is an emerging disadvantage for many populations. One of the main problem regards to this area is the disconnection between people and the resources they need to build basic digital skills that are necessary for career development. LearnX is a digital literacy resource matching platform that bridge those gap. The scope of digital literacy is broad and could potentially be overwhelming for the beginner. Therefore, the essential function of LearnX is to help the disadvantage person find the right resources that match his/her interests and goal in life. The platform would consider the career path that the learners want to pursue and the skills that they already have in order to match them with the appropriate digital lessons. By partnering with existing organizations such as Digital Literacy portal initiative that are currently promoting digital literacy, LearnX's proactive approach can help those organization fulling their mission more effectively. The major step in creating these platform is to design an assessment tool that can help evaluating the skill of the person. The assessment tool will be evaluated by the expert in the field of education and will be tested on the focus group. The second phase is to collect all the resources available regard to digital literacy and categorize them into different scheme in database, this process can be accomplished automatically using supervised machine learning and graph network. The third phase is to run a pilot study and get feedback from the user whether the resources provided through the platform is relevant and useful to them based on the metrics used in the study. The feedback will help forwarding the project further and improve the matching process.

Introduction to disadvantage

Digital or technological incompetence is an emerging disadvantage for many populations. According to the World Economic Forum, society will lose 5 million jobs to computers and automated system over the next five years. Therefore, people who does not have ability to work with digital environment will be unemployed. Basic technological skills will become crucial for many jobs in the near future as we move to a more cloud-based and connected devices world. There are significant disparities between demographic groups: people with low incomes, seniors, disabilities, minorities, non-family households, the less-educated, and the non-employed tend to lag behind other groups in technological literacy. However, vacancies for technology related jobs are going unfilled in large numbers. There are 40,000 technology oriented degree earners each year but roughly 4 million job vacancies for computer workers. Therefore, there is a gap between people and the basic digital skills they need for career development.



Metrics

The challenge for technological incompetence population is the the lack of basic digital skills. Based on U.S. National Telecommunications and Information Administration, there are 5 categories of digital literacy skills :

Using a Computer or Mobile Device : Learn how to use the mouse, keyboard, icons, and folders



Using Software and Applications : word processing, creating : spreadsheets, tables and databases



Using the Internet Search the Internet, use email, register on a website



Communicating on the Web : Share photos and videos, communicate using social networks, learn to be an informed digital citizen

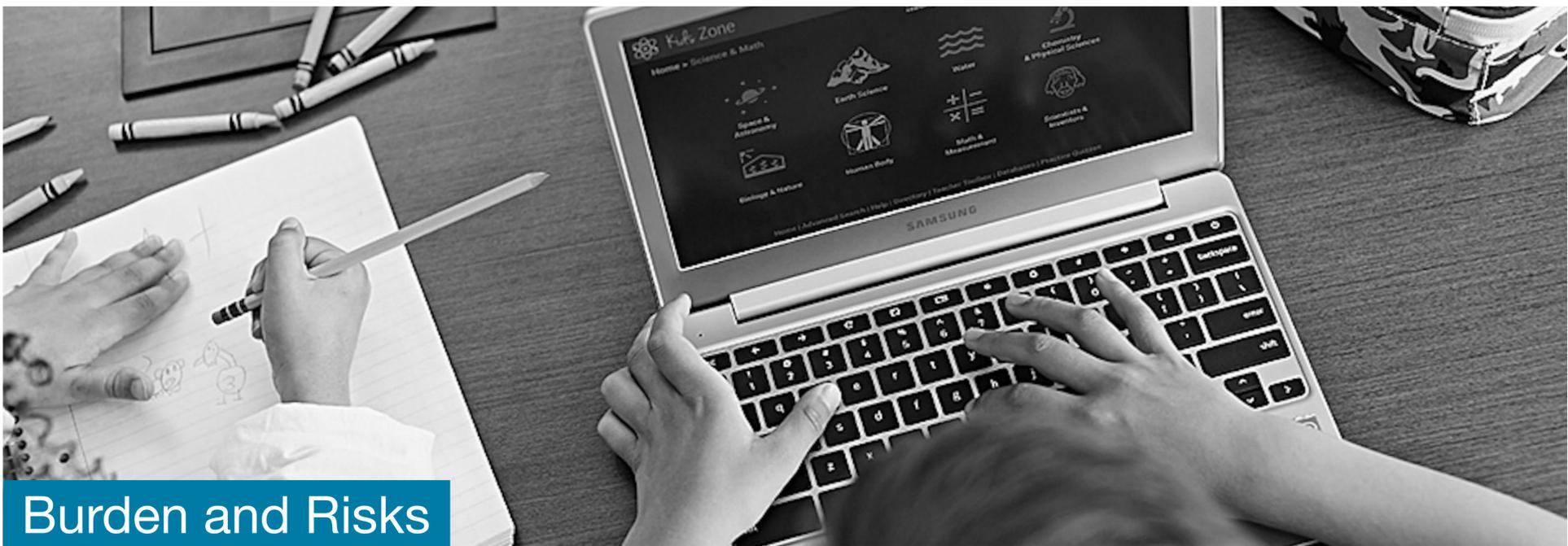


Child Online Protection : Help children learn to be responsible and make informed decisions online



The following metrics are developed to measure the efficacy of the intervention in bridging the gap between people and resources.

- 1.) The participant's digital proficiency score based on California state university's digital proficiency test
- 2.) The participant's confidence in digital literacy
- 3.) The amount of opportunity that the participants receive after participate in the program
- 4.) The satisfaction and feedbacks from the participant



Burden and Risks

The Chartered Institute for IT suggests that the lack of digital literacy skills is a disadvantage in many dimensions because digital literacy enables people to receive the useful information and connect to agencies that have benefits for them. However, the most significant burden of not having the digital literacy is in financial stability. The institute's research in 2013 reveals that approximately 1 in 10 teenagers in the United Kingdom don't have the confidence or ability to fill out online job applications, which is the first step for building the career path. There are many risk factors associate with the digital literacy incompetence, but people with low incomes, seniors, disabilities, minorities, non-family households, the less-educated, and the non-employed tend to lag behind other groups. The summary of the risks for digital literacy incompetence and the risks from digital literacy incompetence are on the table below.

Table 1 : The summary of the risks for digital literacy incompetence and the risks from digital literacy incompetence

Risks for Digital literacy incompetence	Risks from Digital literacy incompetence
<ol style="list-style-type: none"> 1. Accessibility to the technology <ol style="list-style-type: none"> 1. poverty 2. lack of education 3. lack of access to technology 4. Digital natives and immigrants 2. Engagement with the technology <ol style="list-style-type: none"> 1. number of hours spend on using technology 2. number of hours spend on the internet 	<ol style="list-style-type: none"> 1) Limited career choices 2) Limited knowledge for decision making 3) Narrow perception toward new information 4) Lack of ability to access and navigate digital infrastructures

Related Works & Interventions

Technological incompetence is a global issues, there are research studies and trials that were focusing on solving aspects of this problem. However, none of the research focuses on diagnosing and matching the right resources with the disadvantage person.

Exploring adult learners' perceptions of technology competence and retention in web-based courses

authors: Jennifer Calvin, Beth Winfrey Freeburg

The purpose of the study was to evaluate the technology for self-reported competencies of adult online learners. The research question is whether self-reported technology competence was related to students' intent to continue learning via web-based courses. Based on 510 students for a response rate of 51% on the online platform. The results indicated that there was small relationship (not statistically significant) between self-reported level of computer competence and intent to continue taking web-based courses. However, adult learners participating in the study indicated that they continue to struggle with completion of assignments and managing time when taking web-based courses, and that students want more technical training. The result of this experiment demonstrate a need for more research in the area of digital training platform for technology competence. The intervention in the previous week seem to be more effective. Questions remain to be answered are 1) Why does researcher under do research in the area of technology literacy? 2) How to motivate the participant to stay engage with the online platform through out the course of the training 3) How to maximize the efficacy of the online platform? What factors involve in designing the online environment 4) In the real implementation, who should be responsible for updating the lesson and keep the contents relevance.

The effects of information and communication technology on at risk children of low economic status: Make It-Take It After-School Case Study

Author : Shahram Amiri, Stetson University, USA

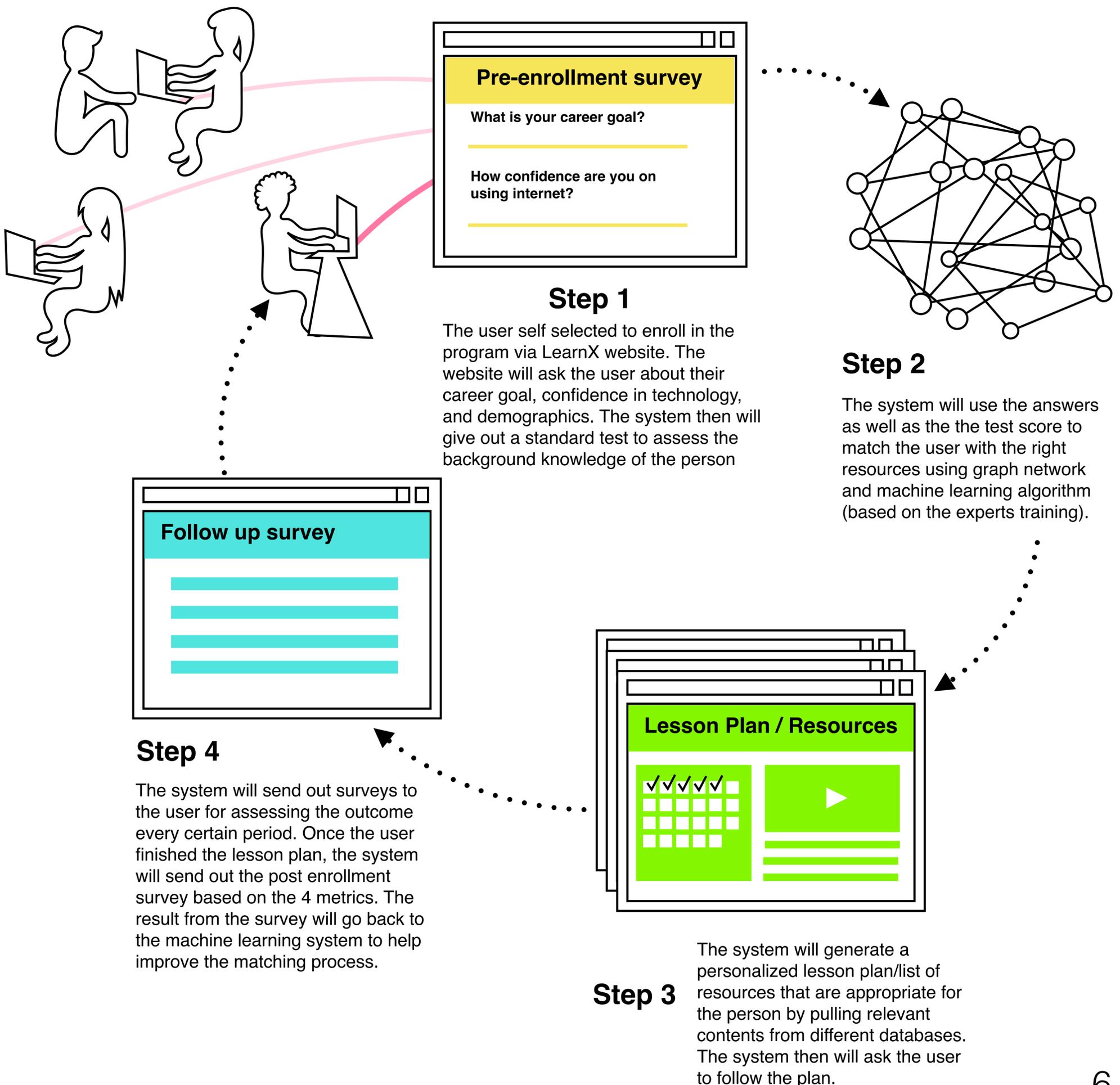
The study focused on the method to enrich digital literacy to at risk children of low economic status within the State of Florida. The goals of this randomized control study are 1) to answer whether providing students with relevant software and hardware skills and knowledge influence long-term academic performance? 2) Will digital literacy increase the student's commitment and desire to actively participate in future learning processes ? A total of 450 middle school and high school children participated in the study and were randomly assigned to the control group or study group. Each student came from low income and high risk community. The findings of this study demonstrate a significant increase in performance and participation in academic and learning processes by students that completed "Make It-Take It After-School program".

Project Concept : Introducing learnX

LearnX is a digital literacy resource matching platform for disadvantage population. The idea of the project was created from the realization that there is a gap between people with technological incompetence and the existing resources. The scope of digital literacy is broad and could potentially be overwhelming for the beginner. Therefore, the essential function of LearnX is to help the disadvantage person find the right resources that match his/her interests and goal.

LearnX

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ASU Advisor

David Tinapple, School of Art, Media, and Engineering

David's core research questions look at the complex cognitive strategies employed by people at the intersection of technology and work, but the focus has shifted towards designing better tools and systems for teaching and learning. David uses his classrooms as a natural lab in which new ideas, strategies, and tools can be tested. David is designer and co-creator (with Professor Loren Olson) of CritViz.com, an online tool for teachers and students, designed to support peer-review and critique in classrooms. CritViz started as an experiment in scaling up the traditional art school "crit" to larger sized classrooms (50-100 students), but quickly gained popularity and is now the center of a research project and a startup company. CritViz allows teachers facilitate large scale formative peer review sessions in which students critique, rank, and rate each others work. This goes beyond "peer grading," towards classroom self-curation, and a search for ways to change the cognitive framework and incentive structure in today's classrooms. MOOCs are interesting but this research is primarily concerned with the face-to-face classroom, and scaling up the levels of engagement. Why can't "bigger is better" apply to the classroom?



Population & Execution Plan

The LearnX project aims to collaborate with the Digital Literacy portal, which is an initiative of the Obama Administration to serve as a valuable resource to practitioners who are delivering digital literacy training and services in their communities. The Digital Literacy portal organizes content conveniently, enables valuable discussion and collaboration among users and elevates best practices to improve the quality of digital literacy offerings. With such collaboration, The LearnX can use Digital Literacy portal database as the starting point for collecting resources. The population that the project will recruit will be self selected and will be divided randomly into two groups. One group (experimental) will get to use LearnX platform, and another group (control) will be using alternative digital literacy resource website.

The major step in creating these platform is to design an assessment tool that can help evaluating the skill of the person. The assessment tool will be evaluated by the expert in the field of education and will be tested on the focus group. The second phase is to collect all the resources available regard to digital literacy and categorize them into different scheme in database, this process can be accomplished automatically using supervised machine learning and graph network. The third phase is to run a pilot study and get feedback from the user whether the resources provided through the platform is relevant and useful to them based on the metrics used in the study. The feedback will help forwarding the project further and improve the matching process.

Relevant State Policies

State legislatures are investing in programs and professional development to provide digital literacy skills for students and educators. A handful of states are modifying teacher training program requirements to include digital age literacies.

Washington: SB 6293 (2016) concerns safe technology use and digital citizenship in public schools, provides a process in which students, parents or guardians, teachers, librarians, other school employees, administrators, and community representatives to engage in an ongoing discussion on safe technology use, internet use, digital citizenship, and media literacy as part of implementing the state's basic education goal and essential academic learning requirements for technology.

Utah: HB 213 (2015) requires a school community council to provide for education and awareness on safe technology utilization and digital citizenship that empowers a student to make smart media and online choices and a parent or guardian to know how to discuss safe technology use with their child.

Florida: HB 5101 (2014) requires public schools to provide K-12 students with opportunities for learning computer science, including computer coding and computer programming. It permits elementary and middle schools to establish digital classrooms to improve digital literacy and competency to learn digital skills, such as coding, multiple media presentation, and the manipulation of multiple digital graphic images; and to earn digital tool certificates and grade-appropriate, technology-related industry certifications. It requires the Department of Education to develop a five-year strategic plan for integrating technology in classrooms, with minimum requirements for professional learning opportunities that help educators identify the types of digital tools and resources they need to manage, assess and monitor student learning and performance.

Maine: SP 161 (2011) requires the commissioner of education to develop a program of technical assistance for instruction in digital literacy, including offering professional development and training for educators in the effective use of online learning resources. The technical assistance must include a model for instruction that promotes digital literacy for students; a clearinghouse of information on using online learning resources, including best practices in using open educational resources and open-source textbooks; and professional development and training for educators in effectively using online learning resources.

California (2010) The overall purpose of the California ICT Digital Literacy Policy Statement and Action Plan is to ensure that learners of all ages are successful content creators and users of technologies that foster the sharing, gathering and interpreting of information, ideas and texts central to active and effective participation in society.

Implementation of the policy and plan will support the needs of California's workforce that are critical to a thriving and robust 21st Century economy. The California Department of Labor, in its report on Information & Communications Technologies in California (September 2009) estimated growth in employment of nearly 40% in computer systems design and related services, a direction that accounts for almost one-fourth of all new jobs created in California over the next five years.

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