Testimony of Behalf of the University of Maine System
In Support of LD 127, *Resolve To Establish a Pilot Program To Provide Grants for Professional Development in Computer Science Instruction*
Presented by Marina Van der Eb, University of Maine RiSE Center
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Senator Daughtry, Representative Brennan and distinguished members of the Joint Standing Committee on Education & Cultural Affairs: My name is Marina Van der Eb and I am the Coordinator for the Maine STEM Partnership, a program of the University of Maine's Center for Research in STEM Education (RiSE Center). Consistent with our collective efforts to strengthen statewide PK-20 STEM + C education including through research, teacher preparation, professional development and provision of instructional resources, I am here on behalf of the University of Maine and the University of Maine System to voice our support for LD 127, *Resolve To Establish a Pilot Program To Provide Grants for Professional Development in Computer Science Instruction*.

Our state should be proud to have pioneered the integration of technology into our PK-12 classrooms more than two decades ago with the Maine Learning Technology Initiative. But if we are to adequately prepare Maine students for success in the 21st century knowledge economy, we must do more to improve quality and equitable access to computer science education in our schools so they develop both the necessary computational thinking skills and the comfort with technology needed in our increasingly digital world. And that of course starts with improving instructional capacity and expanding access to computer science learning experiences for all students statewide.

Many Maine PK-12 schools currently lack computer science teachers and most course opportunities that do exist for students are at the high school level as either electives or Advanced Placement courses, which can be daunting to learners with limited prior experience or simply unavailable to students in some districts. UMaine's RiSE Center is working to change that, and we believe LD 127 could help.

We conduct interdisciplinary research into education at all levels of instruction within the disciplines of science, technology, engineering, mathematics and computing (known as STEM + C), and in the past decade, have secure over $20 million in external grants to work with Maine educators to integrate Maine classrooms with research-supported practices. To date, we have worked with over 2,200 PK-12 educators and 200 schools from Madawaska to Kittery, and Lubec to Rangeley.

For example, thanks to a National Science Foundation award, we are currently working with 30 Maine teachers to develop and test lessons that integrate computer science instruction into middle school science classrooms. This strategy leverages the knowledge of trained

science educators and existing instructional time that includes all students at the middle school level to expand opportunities for students to engage in exciting computer science learning regardless of current available personnel or course offerings at the school.

Research that is part of this project focuses on identifying the knowledge that science teachers need in order to achieve effective integration of computing and the supports that are most important. We also seek to understand how integration of computing with STEM contributes to student learning about science and computing and attitudes toward STEM careers, with particular attention to closing gender gaps and engaging students from economically challenged communities.

Through partnership with teachers, administrators, education researchers, and University of Maine STEM, Education, and School of Computing and Information Science faculty, we have successfully implemented a professional learning experience that has supported middle school science teachers to develop and pilot three integrated modules in connected to the topics of plate tectonics, ecology, and force and motion. Engaging students with computational thinking and computer science in these contexts allow for creative modeling of Earth's history, using sensors to understand changes in the environment, and programming robots to visualize different types of motion.

While many of these teachers joined this work with little or no computer science background, they are now comfortable including computational thinking and computer science concepts in their instruction. Extended learning opportunities through ongoing professional learning, access to technology provided through the grant, and a strong supportive community were all key in helping these teachers successfully engage their students with computer science concepts and practices. Throughout this entire process, teachers are engaged in this work as professional collaborators and receive stipends for their time and expertise, in addition to contact hours used towards re-certification.

This is an example of what is being done in Maine to find creative, collaborative approaches that serve and support both teachers and students.

If LD 127 moves forward, the University of Maine and our sister institutions within the University of Maine System would welcome partnership with the Maine Department of Education and local districts to support its implementation, and would be a natural provider of the professional development outlined in the bill given our expertise and relationships across the state to advance high-quality, high-impact STEM+C teaching and learning.