

**2023 HOUSE EDUCATION**

**HB 1398**

# 2023 HOUSE STANDING COMMITTEE MINUTES

## Education Committee Coteau AB Room, State Capitol

HB 1398  
2/14/2023

Relating to computer science and cybersecurity instruction for adult learners; to mandatory computer science and cybersecurity instruction and minimum requirements for high school graduation; and to provide an expiration
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Chairman Heinert opened the hearing at 9:00 AM

Members present: Chairman Heinert, Vice Chairman Schreiber-Beck, Representatives Conmy, Dyk, Hager, Hauck, Heilman, Hoverson, Jonas, Longmuir, Marschall, Murphy, Novak, and Timmons.

Superintendent's Student Cabinet was present for the meeting.

### Discussion Topics

- Elementary and middle school intro
- Distance learning
- Approved school board integration program
- Cyber security standards
- Teacher credentials
- Emerging digital world
- ASVAB test
- Privacy concerns
- Digital hygiene
- Privacy awareness
- Proposed amendment
- Ignite ND 2023 Summit
- Learn Everywhere
- Ethics
- Data breaches
- Choice Ready Initiative

Representative Mike Lefor, District 37, introduced HB 1398, (#20815)

Mark Hagerott, Chancellor, NDUS, Testimony (#20696)

Shawn Riley, CIO, Bitzero International, energy data center, multinational headquarters based in ND. Verbally testified in support

Dr. Alyssa Martin, Director, ND Center for Distance for Education, Testimony (#20722)

Maria Naset, Senior Policy Advisor, Office of Governor, Testimony (#20741)

Wayde Sick, State Director, ND CTE, Testimony (#20703)

Katie Ralston Howe, Director, Workforce Division, Testimony (#20760)

Terry Effertz, Tech ND, Testimony (#20719)

Sean Roberts, VP Vice President of Government Affairs, Code.org, Testimony (#20459)

Darin Hanson, Homeland Security Division Director, ND Department of Emergency Services, Testimony (#20764)

Jay Sheldon, Strategy and Policy Officer, ND National Guard, Testimony (#20738)

Tommy Kenville, Isight Drone Service, Grand Forks, Testimony (#20725)

Patrick Bertagnolli, ND Job Service, Testimony (#20686)

Blair Thorson, Microsoft, presented Taya Spelhaug Testimony (#20730)

Marisa Riesinger, Elementary Library Media Specialist, Dickinson Public School, Testimony (#20735)

Mike Heilman, Executive Director, North Dakota Small Organized Schools (NDSOS), Testimony (#20759)

Greg Hoffman, Deputy CIO, ND Information Technology Department, Testimony (#20718)

Kirsten Baesler, ND Superintendent of Schools, DPI, Testimony (#20763)

Gavin Kratcha, student, Hankinson Public School, Testimony (#20740)

Zoey Bundy, Senior, Davies High School, Testimony (#20818)

Katherine Grindberg, Executive VP, Testimony (#20723)

**Additional written testimony:**

- Richard Smith, Stark County resident, father, Testimony (#20534)
- Josh Kramer, Executive VP, General Manager, NDAREC, Testimony (#20650)
- Dave Wheeler, Testimony (#20702)
- Delore Zimmerman, Executive Director, Testimony (#20712)
- Jordan Zakery, Testimony (#20752)
- Greg Tehven, Testimony (#20769)
- Chantel Southam, Testimony (#20688)
- Kevin Hoherz, ND CEL, Testimony (#20828)

10:55 AM Chairman Heinert closed the hearing.

10 minutes recess

11:05 AM Chairman Heinert opened the meeting.

House Education Committee  
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Page 3

Representative Schreiber Beck moved to adopt proposed amendments. Testimony (#20726, #20727, #20777) (Addition of a new subsection on page 7 line 4.)

Seconded by Representative Longmuir.

Voice vote: Motion carried.

Representative Hager moved a DO PASS as Amended

Seconded by Representative Murphy. It was decided to leave this motion on hold until after the House floor session.

11:16 AM Chairman Heinert closed the meeting until after floor session.

*Kathleen Davis, Committee Clerk*



February 14, 2023

24  
2-14-23

PROPOSED AMENDMENTS TO HOUSE BILL NO. 1398

Page 7, after line 4, insert:

"i. The requirements of subdivision h of subsection 1 are waived if the student has completed a computer science and cybersecurity integration plan approved by the school board."

Page 7, line 12, after "grants" insert "not to exceed three hundred thousand dollars total"

Page 7, line 14, remove the first "and"

Page 7, line 14, after "centers" insert "and learning centers that qualify as nonprofit entities under section 501(c)(3) of the federal Internal Revenue Code [26 U.S.C. 501(c)(3)]"

Page 7, line 17, remove "and"

Page 7, line 17, after the second "centers" insert "and learning centers that qualify as nonprofit entities under section 501(c)(3) of the federal Internal Revenue Code [26 U.S.C. 501(c)(3)]"

Page 7, line 19, replace "adopt rules" with "create guidance"

Renumber accordingly

# 2023 HOUSE STANDING COMMITTEE MINUTES

**Education Committee**  
Coteau AB Room, State Capitol

HB 1398  
2/14/2023

Relating to computer science and cybersecurity instruction for adult learners; to mandatory computer science and cybersecurity instruction and minimum requirements for high school graduation; and to provide an expiration
--

3:42 PM

Chairman Heinert opened the meeting. Members present: Chairman Heinert, Vice Chairman Schreiber-Beck, Representatives Conmy, Dyk, Hager, Hauck, Heilman, Hoverson, Jonas, Longmuir, Marschall, Murphy, Novak, and Timmons.

### Discussion Topics:

- Committee action

The following motion was left open from the morning meeting for further research, to be voted on following the afternoon House floor session:

Rep Hager moved a Do Pass as Amended, seconded by Rep Murphy.

Representatives	Vote
Representative Pat D. Heinert	Y
Representative Cynthia Schreiber-Beck	Y
Representative Liz Conmy	Y
Representative Scott Dyk	N
Representative LaurieBeth Hager	Y
Representative Dori Hauck	N
Representative Matt Heilman	N
Representative Jeff A. Hoverson	N
Representative Jim Jonas	Y
Representative Donald W. Longmuir	Y
Representative Andrew Marschall	Y
Representative Eric James Murphy	AB
Representative Anna S. Novak	Y
Representative Kelby Timmons	N

**8-5-1 Motion carried. Rep Schreiber Beck is carrier.**

3:46 PM Chairman Heinert closed the meeting until after floor session.

*Kathleen Davis, Committee Clerk*

**REPORT OF STANDING COMMITTEE**

**HB 1398: Education Committee (Rep. Heinert, Chairman)** recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO PASS** (8 YEAS, 5 NAYS, 1 ABSENT AND NOT VOTING). HB 1398 was placed on the Sixth order on the calendar.

Page 7, after line 4, insert:

"i. The requirements of subdivision h of subsection 1 are waived if the student has completed a computer science and cybersecurity integration plan approved by the school board."

Page 7, line 12, after "grants" insert "not to exceed three hundred thousand dollars total"

Page 7, line 14, remove the first "and"

Page 7, line 14, after "centers" insert "and learning centers that qualify as nonprofit entities under section 501(c)(3) of the federal Internal Revenue Code [26 U.S.C. 501(c)(3)]"

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Page 7, line 19, replace "adopt rules" with "create guidance"

Renumber accordingly

**2023 SENATE EDUCATION**

**HB 1398**

# 2023 SENATE STANDING COMMITTEE MINUTES

**Education Committee**  
Room JW216, State Capitol

HB 1398  
3/15/2023

Relating to computer science and cybersecurity instruction for adult learners; relating to mandatory computer science and cybersecurity instruction and minimum requirements for high school graduation; provide an expiration date.
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9:00 AM Chair Elkin opened the hearing. Present: Chair Elkin, Vice Chair Beard, Sen Axtman, Sen Conley, Sen Lemm, and Sen Wobbema.

## **Discussion Topics:**

- Task force recommendations
- Foundational knowledge
- Center for Distance Education (CDE)
- School board directs integration plan
- Internet safety
- Uniform system

Rep LeFor, Dist 37, bill sponsor, testified in support #25201, #25202.

Jay Sheldon, ND Nation Guard, Strategy/Policy Officer, testified in support #24901.

Mark Hagerott, University Chancellor, testified in support #24958.

Kristin Baesler, Supt Dept Public Instruction, introduced a video.

Zoey Bundy, testified via video, in support #24970.

Kristin Baesler continued testifying in support #25171.

Marisa Riesinger, Elementary Media, Dickinson Schools, testified via TEAMS in support #25156.

Katie Ralston-Howe, ND Dept Commerce Director, testified in support #25290.

Dr. Alyssa Martin, ND Center Distant Education, testified in support #25087.

Mike Heilman, ND Small Organized Schools, testified in support #25064.

Cale Dunwoody, Fargo Chamber Commerce testified in support #25069.

Darin Hanson, ND Homeland Security, testified in support #25009.

Wayde Sick, Director Career Tech Education testified in support #24193.

Greg Hoffman, ND Information Tech Dept, testified in support #25059.

Dr. Martin answered a question from Sen Conley.

Terry Effertz, TechND, testified in support #25158.

Sean Roberts, Code.org., Seattle, WA, testified in support #24485.

Kevin Hoherz, ND Council Educational Leaders testified in support #24751.

Blair Thorson, Microsoft, testified in support with no written testimony.

Shawn Riley, testified in support with no written testimony.

**Additional written testimony:**

Greg Tehven, Emerging Prairie, Fargo, ND in support #25164.

Delore Zimmerman, Valley Prosperity Partnership, Grand Forks, ND in support #24998.

Gavin Kratcha, Hankinson School, in support #24973.

Byron Snider, Scheels, Fargo, ND in support #24850.

Zachary Smith, Government Relations, Mandan, ND in support#24832.

Maria Neset, Governor Office, in support #24830.

Patrick Bertagnolli, ND Job Service in support #24798.

Taya Spelhaug, TechSpark, Horace, ND in support #24796.

Jordan Zakery, Regional Advocacy Director at ExcelinEd, neutral #25001

10:49 AM Chair Elkin closed the hearing.

*Pam Dever, Committee Clerk*

# 2023 SENATE STANDING COMMITTEE MINUTES

**Education Committee**  
Room JW216, State Capitol

HB 1398  
3/15/2023

Relating to computer science and cybersecurity instruction for adult learners; relating to mandatory computer science and cybersecurity instruction and minimum requirements for high school graduation; provide and expiration date.

11:15 AM Chair Elkin opened committee work. Present: Chair Elkin, Vice Chair Beard, Sen Axtman, Sen Conley, Sen Lemm, and Sen Wobbema.

**Discussion Topics:**

- Committee action

Sen Axtman moved a DO PASS.

Sen Conley seconded the motion.

<b>Senators</b>	<b>Vote</b>
Senator Jay Elkin	Y
Senator Todd Beard	Y
Senator Michelle Axtman	Y
Senator Cole Conley	Y
Senator Randy D. Lemm	Y
Senator Michael A. Wobbema	Y

ROLL CALL VOTE: YES – 6 NO – 0 Absent – 0 Motion PASSED

Sen Axtman will carry the bill.

11:17 AM Chair Elkin adjourned the meeting.

*Pam Dever, Committee Clerk*

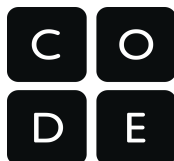
**REPORT OF STANDING COMMITTEE**

**HB 1398, as engrossed: Education Committee (Sen. Elkin, Chairman)** recommends **DO PASS** (6 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). Engrossed HB 1398 was placed on the Fourteenth order on the calendar. This bill does not affect workforce development.



**TESTIMONY**

**HB 1398**



February 14, 2023

**Re: HB 1398; Support**

Dear Members of the Education Committee,

Code.org is a nonprofit organization dedicated to expanding access to computer science courses for all students. **Code.org fully and emphatically supports HB 1398.**

The components of this bill are essential to ensure that all students have a foundational understanding of computer science necessary for our modern world. Computing is a foundational skill for K–12 students. It develops students' computational and critical thinking skills and teaches them how to create—not just use—new technologies. In addition to the more than 1,500 currently open computing jobs in North Dakota, computing skills are increasingly valued in every sector, including agriculture, design, and manufacturing jobs. These open jobs will continue to grow, and without the necessary skills to fill them, our students will get left behind. Today, just 44% of high schools in North Dakota teach computer science and only 15 schools offered an AP Computer Science course in 2019–2020.

But this goes far beyond just preparing students for jobs. While not every student will become a computer scientist or even pursue a STEM career, all will benefit from learning fundamental CS concepts and practices. Multiple studies show that students learning computer science in primary school perform better in reading, math, and science. Computer science education promises to significantly enhance student preparedness for the future of work and active citizenship.

I ask for your full support of HB 1398. Thank you for your efforts in providing students in North Dakota with the foundational computer science instruction that they need.

Sincerely,

Sean Roberts  
Vice President of Government Affairs, Code.org  
[www.code.org](http://www.code.org)

Dear Members of the Education Committee,

I fully support HB 1398. The components of this bill are essential to ensure that all students have a foundational understanding of computer science necessary for the 21st Century and beyond. This foundational skill directly benefits students in being choice ready. Computing is a foundational skill for K–12 students. It develops students' computational and critical thinking skills and teaches them how to create—not just use—new technologies. Computing skills are increasingly valued in every sector, including agriculture, design, and manufacturing jobs. These open jobs will continue to grow, and without the necessary skills to fill them, our students will get left behind. But this goes far beyond just preparing students for jobs. While not every student will become a computer scientist or even pursue a STEM career, all will benefit from learning fundamental CS concepts and practices. Multiple studies show that students learning computer science in primary school perform better in reading, math, and science. Computer science education promises to significantly enhance student preparedness for the future of work and active citizenship. With North Dakota as a leader in education, let's not fall behind at this critical juncture. It is the time for our continued growth mindset that allows cross-curricular learning for a future that also holds digital literacy as equally important as responsibility. I ask for your full support of HB 1398. Thank you for your efforts in providing students in North Dakota with the foundational computer science instruction that they need.

Sincerely,

Richard Smith  
Resident of Stark County  
Born, raised, and educated in North Dakota  
Husband of a North Dakota Native  
Father of 3 North Dakota children

February 14, 2023

To: N.D. House Education Committee  
 From: Josh Kramer, executive vice president and general manager, NDAREC  
 RE: **Support of HB 1398**

Chairman Heinert, and members of the House Education Committee, my name is Josh Kramer, and I'm the executive vice president and general manager of the North Dakota Association of Rural Electric Cooperatives, or (NDAREC). We represent sixteen electric distribution cooperatives and five generation and transmission cooperatives that generate, transmit and distribute electricity and maintain more than 64,000 miles of powerlines across the state of North Dakota.

The North Dakota Association of Rural Electric Cooperatives supports K-12 educational programs focused on computer science and cybersecurity. In today's highly interconnected world, it's imperative that technology is available, and data and systems are protected and secure. To accomplish this, industry and government must partner to enhance, grow and inspire those who will comprise our future workforce and encourage careers in the fields of computer science and cybersecurity.

The electric industry has complex information technology systems that improve service reliability, resilience and efficiency; therefore, electric utilities must continuously work to secure electric systems and data.

It can be difficult to recruit and/or find local qualified professionals required to manage the protection of computer systems. Providing opportunities for all students to engage in computer science and cybersecurity programs is crucial to growing the local workforce of tomorrow. Therefore, we urge your support and thank you for opportunity to submit testimony.

**House Appropriations  
HB1398  
February 14, 2023**

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Chairman Heinert and members of the House Education Committee, my name is Patrick Bertagnolli, and I am the Executive Director for Job Service North Dakota. I am here today in support of HB1398.

I have been a member of the Workforce Development Council since 2014 and continue to serve on this committee in my current capacity as Executive Director of Job Service North Dakota. Through the work on this committee, we have supported the need for digital literacy for all citizens of North Dakota. Additionally, as a member of the State Board for Career and Technical Education, I have also been involved in discussions related to this topic and voted to support HB1398.

Job Service North Dakota Workforce Centers often see job seekers and Unemployment Insurance claimants with barriers to employment, including lack of basic computer knowledge and skills. They often don't understand the basic computer hardware, such as a mouse or keyboard. Additionally, navigating a website, using email, or filling out job applications is often foreign to some of these customers.

Twenty-First Century skills are necessary for students and future job seekers to be prepared for the workforce. Computer Science and specifically Cybersecurity instruction impact all industries in North Dakota from Ag to Energy. Regardless of the industry or career choice, there are typically job requirements for some form of technology knowledge and skill. It is critical for students to be equipped with these skills to navigate in today's workforce. The earlier we can reach students and the more we can continue to educate them on their learning journey as it relates to Computer Science and Cybersecurity instruction, will only improve their employability upon graduation.

February 13, 2023

Dear Members of the Education Committee:

I fully support HB 1398. The components of this bill are essential to ensure that all students have a foundational understanding of computer science necessary for now and the future.

We are raising children in a tech world. They need and they want to learn more about this. We also need to teach them and make them aware of the dangers of identity theft and scams that are out there. This generation of children, know nothing of the time before computers.

I am a home-grown North Dakotan. My husband is also from North Dakota and is a teacher in the public school in Mohall. I am a business owner in Mohall. We have 3 children who have been born, raised and educated in North Dakota. We love this state! We wouldn't want to live anywhere but this state! I want my children to be able to have career opportunities in this state! My oldest has been trying to figure out what he wants to do when he grows up. He finally found Cybersecurity at BSC. What a hidden gem we have here! He had very little knowledge of computer science or cybersecurity until going to BSC. I want children in our school, and other schools in North Dakota, to have that opportunity! I want them to be exposed to this field before college. I want to give kids the opportunity to explore what they want to do when they graduate high school while still in high school! And without being able to offer this in high school, they might not ever know. This is a growing career field and there are only 44% of the schools in North Dakota offering this. Please change this. I was on our local school board for 9 years and our number one thought in everything we did and every decision we made, is how is this going to impact children.

The other thing that I see in my business (I have a CPA practice), is the new young graduates really struggle with problem solving. If we could offer some computer science classes in high school, this would help with improving problem solving skills. They may not go into computer science or cybersecurity, but this would help build the problem solving skills that they are lacking and use them either in their career field they choose or even real life.

I am asking for your support for HB 1398. I appreciate all that you do and are doing for this great state of North Dakota we all call home. And by giving students in North Dakota the opportunity to learn new and useful skills from computer science instruction, is making this state an even better place to raise a family and live.

Sincerely,

Chantel R Southam CPA  
Mohall ND

**HB1398**

House Education

February 14, 2023

Mark Hagerott, Chancellor, NDUS

701.328.2963 | [mark.hagerott@ndus.edu](mailto:mark.hagerott@ndus.edu)

Chair Heinert and Committee Members: My name is Mark Hagerott, and I am the Chancellor of the North Dakota University System. I'd like to provide this written testimony in support of House Bill 1398, as the NDUS and its institutions have interest in digital literacy to be extended through public education.

As this committee and the greater legislature certainly understands, cyber security is becoming an increasingly common concern. Numerous workforce and higher education studies have shown the growing need for technical skills related to computer science and cyber security in more and more positions, as both have become instrumental for a majority of jobs throughout business and industry.

The university system supports this bill, which would provide training to our K-12 system and create opportunities for our elementary and secondary students to equip themselves with the digital skillsets that will be demanded of them upon graduation and entry into the workforce. This proposal complements the State Board of Higher Education's expectation of a digital literacy component as a general education requirement of NDUS graduates.

The university system's Dakota Digital Academy initiative has already found success in offering digital content such as this to our state's post-secondary institutions. I believe such a mechanism could be useful for the development and delivery of related digital content in the future at both the K-12 and postsecondary levels.

This concludes my testimony for HB1398, and I will stand for questions from the committee.

Thank you.

# Manvel Public School

Inspiring 21st Century Learners to Influence 22nd Century Successes



February 13, 2023

Good morning Chairman Heinert and members of the committee,

My name is Dr. Dave Wheeler and I am the Superintendent for Manvel Public School. Please consider this testimony as neutral for HB 1398. We all understand the importance of cyber education with children in the 21st century and schools can certainly support and help with the teaching of best practice.

I would encourage this committee to also reflect on the other various mandates that have been assigned to our teachers in the past few years. In our elementary setting, teachers are held to a standard of success for Reading and Math scores yearly. Our teachers at all grades of elementary school spend an inordinate amount of time with those content areas. In 2022, our teachers in K-3 were required to learn the Science of Reading philosophy and begin implementation of that philosophy with the intent of increasing reading scores. Legislation was passed not to long ago that requires professional development to include trauma, social emotional learning (SEL), suicide prevention, and bullying. There does come a time where teachers' plates are full and they become overwhelmed with responsibilities, some that maybe they don't feel qualified to support.

While I understand that the cybersecurity standards could fall under the library specialist in our district, I'd also like to note that, in districts like Manvel, our library specialist sometimes fills other roles as well. It could be as a Title teacher, a Math teacher, or any other content area. Library Specialists also have a set of standards they are expected to teach when they have students in the library each week also. For them, knowing when to teach and what to teach can become difficult if 1398 passes and requires them to teach another set of standards.

I ask you to please take all these factors into consideration when you review HB 1398. The role of the teacher is difficult as it is today, adding more to their plates won't lessen the difficulty.

Dr. Dave Wheeler  
Superintendent  
Manvel Public School





**House Education  
HB1398**

**February 14, 2023**

Chairman Heinert and members of the House Education Committee, for the record my name is Wayde Sick, State Director for the Department of Career and Technical Education. I am submitting testimony in support for HB1398.

The State Board for Career and Technical Education has discussed this topic at length and on January 23<sup>rd</sup>, at the Board's last meeting, it voted unanimously to provide its support of HB1398.

As stated, the State Superintendent was tasked to collaborate with stakeholders to determine how to best integrate computer science and cybersecurity into elementary, middle, and high school curriculum. By requiring schools to include this instruction, the state is addressing a few very important issues. First, by providing students instruction throughout their K12 education and starting early, we are able to help students stay safe while online. Instruction could include what to trust while online and how to identify and avoid potential attacks. Secondly, as technology continues to influence more of lives, all workers will need to have a certain level of digital literacy to be able to perform their work responsibilities. From healthcare to construction to teaching, digital literacy is

necessary. These skills are not just for those individuals that are pursuing a career in Computer Science, Cybersecurity, or Information Technology. You may have seen this for yourself last week in Memorial Hall, where several CTE programs from across the state were here to share their programs with you. Finally, providing digital literacy education at an early age can get students on a career path in IT. As of today, there are 689 vacant computer jobs listed on Job Service North Dakota's website, including telecommunications, technology coordinators and engineers. We know this is not an all-inclusive list as not all jobs are posted and many times, multiple open positions are listed in one job posting. Students don't know what they don't know, and by providing them exposure to these skills, we may open their eyes and spark an interest in these in demand, high skill, and high wage occupations. This awareness may drive more students to enroll in Information Technology programs while in high school and ultimately pursue post-secondary opportunities that lead to careers in technology. You can have the opportunity to see students on this career path compete at Cyber Madness, this Thursday and Friday, at the National Energy Center of Excellence on the Bismarck State College campus.

To close, the North Dakota State Board for Career and Technical is supportive of HB1398 and encourages a do pass recommendation.

This concludes my testimony; I will stand for any questions you may have.



Testimony  
**House Education Committee**

HOUSE BILL NO. 1398

February 14, 2023

Chairman Heinert and members of the House Education Committee. The Valley Prosperity Partnership (VPP) is a membership organization led by business executives – joined by economic development, chamber of commerce, and higher education leaders – to advance and advocate for shared strategic economic development opportunities for the Red River Valley region and for North Dakota.

The Valley Prosperity Partnership strongly supports HB1398, which would require the integration of cybersecurity into K-12 classwork (not as a stand-alone course) and mandate a computer science class as a graduation requirement (after 2025).

Having basic computer literacy skills can help children develop advanced skills and create pathways to higher wage occupations. Employers in all sectors of the economy want their workers to have basic computer skills as their organizations become ever more dependent on computers.

Communication today is mostly digital. Staying safe online is one of the most important things that young people can learn about technology. The internet is a part of modern life that contains a lot of hidden dangers, and an adult can't always be there to keep an eye on their activities. The widespread adoption of e-learning in education and the proliferation of social media has increased cyberattacks; cybercriminals are finding more opportunities to defraud people and steal sensitive information.

Educating students in the basics of cybersecurity – many who cannot imagine life without a smartphone – not only protects their identity, but it literally could save their life. Teaching students about cybersecurity from a young age protects not only them, but also our communities, schools, companies, and countries from digital threats and attacks.

The VPP strongly supports HB1398's intention to increase understanding of cybersecurity at all grade levels and the need for a required computer science class prior to graduation.

## Valley Prosperity Partnership Steering Committee

Brian Johnson, CEO, Choice Bank,  
Co-Chair Valley Prosperity Partnership\*

Judd Graham, Market President  
Dacotah Bank - Fargo  
Co-Chair Valley Prosperity  
Partnership\*

Jonathan Holth, JLG Architects  
Vice Co-Chair\*

Marshal Albright, President & CEO  
Cass County Electric Cooperative,

Andrew Armacost, President  
University of North Dakota

Steve Burian, President & CEO  
Burian & Associates

Dan Conrad, President & CEO  
Blue Cross Blue Shield North Dakota

David Cook, President  
North Dakota State University

Tim Curoe, CEO  
RD Offutt Company

Mylo Einarson, President & CEO  
Nodak Electric Cooperative

Chad Flanagan, Partner  
Eide Bailly

Rod Flanigan, President  
North Dakota State College of Science

Todd Forkel, CEO  
Altru Health System

Shannon Full, President/CEO  
Fargo Moorhead West Fargo  
Chamber of Commerce\*

Shawn Gaddie, Director of Infrastructure  
Management Services, AE2S  
AE2S

Jim Galloway, Principal  
JLG Architects

Kevin Hanson, President & CEO  
Gate City Bank

Tiffany Lawrence, CEO & President  
Sanford Fargo

Keith Lund, President & CEO  
Grand Forks Region EDC\*

William C. Marcil, Sr. Chairman  
Forum Communications Company

Pat McAdaragh, President & CEO  
Midco

Jeff Melgaard, Vice President  
Construction Engineers

Tammy Peterson, Grand Forks Region  
President & Ag Banking Director  
Bremer Bank

Joe Raso, President & CEO  
Greater Fargo Moorhead EDC\*

Jim Roers, President & CEO  
Roers Construction & Development

Richard Solberg, Chairman & CEO  
Bell State Bank & Trust

David White, President  
Border States Electric

Barry Wilfahrt, President & CEO  
The Chamber Grand Forks/East Grand  
Forks\*

Chris Wolf, North Valley Market President  
Alerus Financial

Delore Zimmerman, Executive Director\*

\* Member Executive Committee



House Education Committee – HB1398

February 14<sup>th</sup>, 2023

Chairman Heinert and members of the House Education Committee, my name is Greg Hoffman, and I am the Deputy CIO for North Dakota Information Technology. I am here today in support of HB1398.

Technology is transforming virtually every job, every sector, every industry. As this transformation drives demand for a highly skilled workforce, North Dakota's goal is to organically grow the next generation of computer science and cybersecurity professionals, while simultaneously growing our economy and helping set students up for success with 21st-century skills.

In January 2018, North Dakota kicked off the PK-20W Initiative with the goal of "Every Student. Every School. Cyber Educated." This robust ecosystem includes leaders from PK-12, higher education, state agencies, business and industry, workforce development, military and local and national strategic partners. Also in 2018, North Dakota became the "First Certified State Training Partner in the Nation" for Cyber.org which is funded by Homeland Security and whose curriculum is used for teacher training.

NDIT's EduTech division currently offers 7 online computer science and cybersecurity courses for teachers to go at their own pace utilizing the curriculum from Cyber.org. To date, EduTech has trained 261 educators that have received their credentials in computer science and cybersecurity. By Fall of 2023 we are on target to virtualize the Center for Distance Education Cybersecurity content, still partnering with CYBER.org for a High School course, which will help ND schools be able to offer computer science and cybersecurity content without qualified high school teachers. This brings the content to the students and allows teachers time to obtain their certification. EduTech utilizes content not only from Cyber.org, but also Microsoft Minecraft and Code.org, all of which aligns with computer

science and cybersecurity state standards as well as national standards. Most recently, EduTech has partnered with Cisco Networking Academy for their skills-to-job program called Skills for All. As of July 2022, North Dakota is the first state in the nation to provide these courses statewide at no cost to all residents.

In the 21st century, nearly every job in every industry is a computer job. Computer science and cybersecurity are foundational skills that can empower students, teachers and parents to protect themselves online in an increasingly digital world, learn valuable problem-solving skills and prepare for many career opportunities.



**HB 1398**  
**Testimony of Terry Effertz**  
**Executive Director - TechND**

Chairman Heinert and members of the House Education Committee:

My name is Terry Effertz and I'm the executive director of TechND, an association founded by North Dakota business, government and education leaders in the year 2000. TechND advocates for a positive technology business climate, addresses workforce needs, encourages infrastructure development and provides knowledge-sharing opportunities.

On behalf of TechND, please accept our support of HB 1398. As we move further into the 21st century, technology has become an increasingly important aspect of our lives. It has changed the way we work, communicate, and even learn. That's why it's essential that our schools keep up with these changes and equip our students with the necessary skills to succeed in the digital age. Computer science and cybersecurity in education has numerous benefits.

1. Technology makes learning more interactive and engaging. With the help of digital tools students can learn complex concepts in a more accessible and enjoyable way. This type of learning makes it easier for students to remember the information they learn, resulting in a better understanding of the material.
2. Technology provides access to a wealth of information. Students can quickly and easily research various topics and find a vast array of sources. This helps students to broaden their knowledge and gain a more comprehensive understanding of the subjects they are studying, which is a skill that will serve them for life.
3. As technology continues to advance, it becomes an increasingly important skill in the workforce. By integrating technology into the classroom, we can ensure that our students are adequately prepared for the demands of the modern workforce. It's essential that we equip our students with the skills they need to succeed in the digital age and take advantage of the numerous job opportunities that come with it.

Technology has become an integral part of our daily lives, and it's crucial that our education system reflects this. By integrating technology into our high school education system, we can provide our students with the skills and knowledge they need to succeed in the digital age. It's up to us to ensure that our students are prepared for the challenges and opportunities that lie ahead. I urge this committee to give HB 1398 a "do-pass" recommendation.



**Testimony House Bill 1398 – House Education Committee**  
**Representative Heinert, Chairman**  
**February 14, 2023**

Chair Heinert and members of the House Education Committee, for the record, my name is Dr. Alyssa Martin. I am the director of the North Dakota Center for Distance Education (CDE). CDE supports HB 1398, viewing this bill as an effort to help North Dakota students remain competitive with the five states that now require computer science to receive a high school diploma and the 27 states that require schools to offer computer science courses. I will briefly highlight CDE's perspective on what advantages this bill will bring to North Dakota students and spend the remainder of my testimony describing the steps CDE has taken and will continue to take to help support this legislation and the intent behind it.

CDE has offered computer science and cybersecurity courses at the high school level for over ten years. Still, our enrollments are low, with just 75 high school completions in 2021-22 and 68 enrollments and 29 completions so far this year. The numbers that we have seen at CDE reflect a national trend. According to the *2021 State of Computer Science Education* report produced by the Code.org Advocacy Coalition, 78% of high school students have access to a foundational computer science course. Still, only 5% of students enroll in these often optional, elective courses.<sup>1</sup> From our perspective at CDE, an organization that values giving North Dakota students educational access and every learning advantage possible, these trends are disheartening, especially once one is aware of the many benefits of computer science education. To summarize only a few:

- A 2019 meta-analysis study found that, when reviewing 440 other studies of K-12 students who learned computer programming, this exposure to this field substantially improved creativity, mathematical skills, metacognition, spatial skills, and reasoning skills.<sup>2</sup>
- A College Board study showed that students who took computer science significantly outperformed their peers on AP exams in calculus and statistics.<sup>3</sup>

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<sup>1</sup> Hendrickson, K., Gauthier, L., Glennon, M., Harrigan, A., Weissman, H., Fletcher, C., & Mak, J. (2021). *2021 state of computer science education: Accelerating action through advocacy*. Code.org. <https://www.nga.org/webinars/2021-state-of-computer-science-education-report/>

<sup>2</sup> Scherer, R., Siddiq, F., & Sánchez Viveros, B. (2019). The cognitive benefits of learning computer programming: A meta-analysis of transfer effects. *Journal of Educational Psychology*, 111(5), 764.

<sup>3</sup> Buckley, J. (2015). *Preliminary results of AP computer science analyses*. The College Board. <https://code.org/files/CollegeBoardPreliminaryCSMemo.pdf>



- A longitudinal study conducted in two of the largest school districts in the U.S. found that computer science students were more likely to enroll in college than their peers, even after controlling for variables such as socioeconomic status, GPA, race, and gender.<sup>4</sup>
- According to a letter signed by 800 major industry, education, and nonprofit leaders in July 2022, “The USA has over 700,000 open computing jobs but only 80,000 computer science graduates a year.” The letter also emphasizes, “Graduates no longer need to leave their state to pursue careers in tech. Even the smallest town can become a tech hub; the key is education”—an important consideration for a rural state like North Dakota, which has and continues to take extensive measures to retain our students after high school and college graduation.<sup>5</sup>

Knowing the value of computer science education, how can a state ensure that students participate? Clearly, participation in computer science courses increases exponentially when states require it as part of high school graduation requirements, which is why Code.org has recommended such a legislative change as part of its “Nine Policies to Make Computer Science Fundamental.” There are both direct and indirect benefits to such a requirement. According to Code.org, “after South Carolina implemented its graduation requirement for computer science, graduation rates increased as a whole and for every racial and ethnic group tracked by the state.”<sup>6</sup> In addition to recommending that a computer science graduation requirement be codified into law, Code.org recommends offering computer science across the K-12 curriculum, citing studies on how early exposure to this content erases students’ fears and stereotypes about participating in computer science courses and helps build a pipeline within the field.

Because of the myriad of positive outcomes associated with computer science education, CDE, like many other state virtual schools, has proactively been offering cybersecurity and computer science coursework, recognizing that for small schools especially, finding qualified teachers, developing curriculum, and finding time within the school schedule to provide these courses can pose a challenge. We do not believe, however, that a lack of local resources should be a reason for denying students the benefit of exposure to computer science education. Throughout its history, CDE has served as an educational support service to ND K-12 schools, especially rural schools, helping provide instruction delivered by a state-licensed teacher in core, elective, and CTE areas when a district needs to fill a gap caused by a teacher shortage, experiences curricular cuts due to low enrollments, or faces the inability to offer certain content due to size or budgeting constraints. Likewise, CDE aims to support K-12 schools with the new requirements in HB 1398 through the following steps.

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<sup>4</sup> Brown, E. A., & Brown, R. S. (2020). *The effect of advanced placement computer science course taking on college enrollment*. West Coast Analytics.

[http://www.westcoastanalytics.com/uploads/6/9/6/7/69675515/longitudinal\\_study\\_-\\_combined\\_report\\_final\\_3\\_10\\_20\\_\\_jgq\\_.pdf](http://www.westcoastanalytics.com/uploads/6/9/6/7/69675515/longitudinal_study_-_combined_report_final_3_10_20__jgq_.pdf)

<sup>5</sup> Roberts, S., Osorio-Glennon, M., Weissman, H., Fletcher, C., Dunton, S., Baskin, J., & Mak, J. (2022). *2022 State of computer science education: Understanding our national imperative*. Code.org.

<https://advocacy.code.org/stateofcs>

<sup>6</sup> Roberts, S., Osorio-Glennon, M., Weissman, H., Fletcher, C., Dunton, S., Baskin, J., & Mak, J. (2022). *2022 State of computer science education: Understanding our national imperative*. Code.org.

<https://advocacy.code.org/stateofcs>

- CDE already offers an elementary scratch coding course and is currently piloting additional elementary curricula to provide young learners with various options for learning the basics of cybersecurity and computer science.
- CDE offers a full year of coding at the middle school level and is working with curriculum vendors to identify additional opportunities to expand its offerings at this level.
- At the high school level, CDE offers two full years of coding courses and one year of cybersecurity coursework. It is actively engaged with Edutech and partners from North Dakota's postsecondary institutions and industry to further expand technology curricular pathways to secondary learners, with the aim of them acquiring post-secondary credit and potentially post-secondary credentials in the form of certificates.
- CDE has identified a plan to scale its current offerings to meet the demand for the courses covered by this bill. DPI will support these efforts by earmarking \$600,000 in federal Elementary and Secondary School Emergency Relief (ESSER) funds to help cover the cost of CDE scaling up its computer science and cybersecurity courses. CDE will expand its adjunct pool to ensure qualified, licensed teachers teach these courses. We have worked with ESPB to identify all current teachers within the state who are qualified to teach computer science and cybersecurity to prepare a distribution list, notifying them of CDE's efforts to hire teachers with computer science credentials. We have had great success in the past recruiting in-state teachers to work as adjuncts for CDE while they maintain their day jobs in local schools.

Because of the value of computer science education, the need to remain competitive with other states already requiring it, and the feasibility of local schools implementing this law with CDE as a partner, CDE recommends a do pass on HB 1398.



### FMWF Chamber Letter of Support for HB 1398

February 14<sup>th</sup>, 2023

Chairman Heinert and members of the House Education Committee:

For the record, my name is Katherine Grindberg and I have the pleasure of serving as the Executive Vice President for the Fargo Moorhead West Fargo (FMWF) Chamber of Commerce. The Chamber's mission is to be a catalyst for economic growth and prosperity for businesses, members, and the greater community. On behalf of our over 1,900 members, I write this letter in support of House Bill 1398.

As many industries across our state and nation evolve and incorporate technology, our education system must also continue to evolve and provide students with foundational computer science and cybersecurity skills. In order for our state to develop a robust conduit of skilled workers, we must adapt our learning models and curriculum. While many students may not pursue a career in Information Technology (IT), Computing, or Cybersecurity, these fundamental skills will be essential for careers in the 21<sup>st</sup> Century. By adjusting curriculums to require computer science classes, we ensure that every student across North Dakota receives an education that meets 21<sup>st</sup> Century industry demands.

On behalf of our members, we respectfully urge a DO PASS recommendation and I would like to thank the committee for their time and consideration. I will now stand for any questions.

Respectfully,

Katherine Grindberg  
Executive Vice President  
FMWF Chamber of Commerce  
[kgrindberg@fmwfcchamber.com](mailto:kgrindberg@fmwfcchamber.com)

Testimony in support of HB 1398

February 14, 2023

Chair Heinert and Education committee members:

For the Record: Tommy Kenville CEO/Founder of Isight Drone Services, Grand Forks ND

Thank you for the opportunity to present this morning. Our company has hired twenty-three people in the drone/tech industry in the last 3 years, and this year, the company will most likely increase by another 5-10 people. It is critical that the North Dakota students we employ have exceptional computer and cybersecurity skills as we operate on government properties, military bases, essential energy infrastructure and for private industry -- it is imperative that our data is secure. Everyone is hit daily with cyber security issues including random texts, emails, robo calls and hackers to name a few.

How many electronic devices do each of you have today? 4-6? Phones, computers, laptops, smart TV's, and many other items that are all run by technology.

Our world today is all about technology whether we like it or not. It is more a part of our lives than some of the core education pillars like English and math. Computers are tools students utilize for completing English and math assignments.

The drone industry has hired about 2000 people in the last 5 years between public and private organizations-private tech companies like mine and Grand Sky; large defense contractors such as Northrup Grumman and General Atomics; the military – Air National Guard and the Grand Forks Air Force Base; institutions of higher education - UND, NDSCS, NDSU, Lake Region, Williston State to name a few. It would be valuable if students graduated with foundational computer science skills that may lead to careers at one of the entities listed.

Our company has sponsored or donated to many STEM activities in Watford City, Grand Forks, Fargo, Bismarck and others. The Tech industry will continue to grow at warp speed in North Dakota and it would be of benefit for K-12 students to have the technical knowledge so they would be able to apply, qualify and obtain high tech careers with excellent pay in North Dakota.

I hope cyber security and computer technology are required classes to take on some level in the K-12 system in North Dakota.

Again thank you for the opportunity to testify this morning and if you have any questions I would be happy to answer.



Tommy Kenville | *CEO/Rainmaker*  
ISight Drone Services | +1(218) 779-9950  
[Tommy@isightdrones.com](mailto:Tommy@isightdrones.com) | [www.isightdrones.com](http://www.isightdrones.com).



PROPOSED AMENDMENTS TO HOUSE BILL ----

Page 7, line 4, after “both.” insert a new subsection that reads “The requirements of subdivision h of subsection 1 are waived if the student has completed a computer science and cybersecurity integration plan approved by the school board”

Page 7, line 20, replace “adopt rules” with “create guidance”

Renumber accordingly

Sixty-eighth Legislative Assembly

(4) Career and technical education courses; and

g. Any five additional units; and

h. One unit of computer science or cybersecurity whether under subdivision b, c, or both.

i. The requirements of subdivision h of subsection 1 are waived if the student has completed a computer science and cybersecurity integration plan approved by the school board.

2. If approved by the board of a school district or nonpublic school, a school district or nonpublic school may develop eligibility criteria or programmatic requirements to allow a passing score on the relevant portions of the GED assessment to receive credit for the corresponding requirements of subdivisions a through d of subsection 1.

**SECTION 4.** A new section to chapter 15.1-26 of the North Dakota Century Code is created and enacted as follows:

**Authority - Adult learning - Computer operations and cybersecurity instruction.**

The superintendent of public instruction shall provide grants to school districts, nonpublic schools, area career and technology centers, job service North Dakota workforce centers, public libraries, and adult education centers to offer computer operations and cybersecurity courses for adults, for the biennium beginning July 1, 2023, and ending June 30, 2025. School districts, nonpublic schools, public libraries, area career and technology centers, job service North Dakota workforce centers, and adult education centers shall use all or part of the grant money to pay a stipend to a teacher of the course. The superintendent of public instruction shall ~~adopt rules~~ create guidance to implement the grant program.

**SECTION 5. EXPIRATION DATE.** Section 4 of this Act is effective through June 30, 2025, and after that date is ineffective.

Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052-6399

Tel 425 882 8080  
Fax 425 706 7329  
www.microsoft.com



February 14, 2023

Re: HB 1398; Support

Dear Members of the Education Committee,

My name is Taya Spelhaug and I am the Manager of the TechSpark program for Microsoft in North Dakota and we fully support HB 1398.

In a world where virtually every industry is being impacted by technology, computer science and cybersecurity are as foundational as reading, writing, and math. Ensuring that every child in North Dakota has access to quality computer science and cybersecurity education is crucial to our workforce development efforts, helping grow our economy and set students up for success regardless of what career path they pursue. Computer science skills are applicable far beyond the technology industry –we aren't only thinking about hiring future Microsoft employees. Nearly every occupation in our modern economy utilizing fundamental computing skills. These are base skills required for countless jobs in the energy sector, health care, agriculture, and aviation to name a few.

Furthermore, parents throughout North Dakota are demanding access to quality courses and programs in this area. Nationally, 93% of parents want their child's school to teach computer science, but fewer than half of schools offer these courses. A lack of access hurts our economy and creates major inequities in education, particularly for rural communities and groups that have been traditionally underrepresented in computer science and other STEM fields.

In addition to being a common-sense investment in our future workforce, education in both computer science and cybersecurity help protect our kids as they enter the digital realm. They not only need to be proficient with these new tools, they also need to learn how to protect their personal and financial information. We have all seen the increase in attempts from lone individuals, state-sponsored actors, and others to steal data from companies, governments, and individual citizens – this is also a public safety priority.

We in the technology-sector stand strongly behind you as you work to tackle these challenges. Microsoft has been a strong advocate for expanding access to computer science and cybersecurity education in North Dakota and across the nation. These efforts have included initiatives such as Technology Education and Literacy in Schools or TEALS. Because there is a critical shortage of computer science teachers, TEALS pairs trained computer science professionals with classroom teachers to team-teach computer science. In North Dakota we have had over 15 schools teaching computer science through the TEALS program.

It's because of this that we respectfully ask the committee to give HB 1398 a DO PASS recommendation to help secure the future of North Dakota's youth in this digital age. Thank you for your time, your consideration and your service to North Dakota.

Thank you,

Taya Spelhaug  
TechSpark Manager ND  
Taya.Spelhaug@microsoft.com

**TESTIMONY ON HB 1398**  
**HOUSE EDUCATION COMMITTEE**  
**By: Marisa Riesinger, Elementary Library Media Specialist**  
**701-290-7732**  
**Dickinson Public Schools**

Mr. Chairman and Members of the Committee:

My name is Marisa Riesinger, and I am an elementary library media specialist for the Dickinson Public School district. I am here to speak in favor of House Bill 1398 regarding computer science and cybersecurity instruction for all students.

Most likely, we are all familiar with the growing statistics about the need for computer science related jobs. In fact, our students will be entering the workforce when computing jobs are the number one source of new wages (Code.org) with over 500,000 new jobs by 2028 (Bureau of Labor Statistics). North Dakota is no exception. In fact, ten-year career projections show an 18.1% increase for information technology jobs which is higher than all other career clusters in the state (ComputerScience.org, 2021). We must ask ourselves: How do we make sure North Dakota students are prepared to be successful? The answer: We must take collective responsibility to ensure North Dakota graduates are college and career ready whether they stay here or represent our state abroad, and this looks very different than it did even five years ago. Thus, guaranteed computer science and cybersecurity instruction must be in every school, in every grade level, and for every student.

Unfortunately, educators are already behind when children get to school. The National Center of Education Statistics reports nearly half of American three- and four-year-old children use the internet from their home – long before they use devices in school. Yet, most of their



caregivers lack the education and training to support their child’s digital awareness and safety. This prioritizes the schools’ need to be adaptive and responsive as they fulfill their role to prepare students to be responsible, ethical, and contributing members in a digitally literate society. We need to shift how we approach education because we are educating a future that is changing at an exponential rate.

In my school, we have prioritized computer science and cybersecurity education. Digital citizenship is an integrated part of library skills but also in content areas (e.g., math, social studies, science) as students use online resources, platforms, and tools to understand and complete learning goals. Students learn how to evaluate information, protect their passwords, establish a positive digital identity, and use strategies to use when they encounter online risks. In addition, we have introduced computer science from kindergarten on up through STEM activities, robotics, and “unplugged” activities [e.g., art, music, mapping, body movement (See Fig. 1)]. We have partnered with high school departments to bring Hour of Code to our students, community members to share their computer science/cybersecurity training and careers, and family nights to share what we are doing. Most importantly, we have come to realize that these concepts and skills are not isolated. They can - and must - be a layer of embedded instruction that lifts learning so students can acquire transferable skills apply in any situation.

**Figure 1**

*Dancing teaches the computer science concepts of loops and sequences in a concrete way*



In fact, computer science isn't about computers at all, but rather about a specific way of thinking. More importantly, it's "a set of skills that teachers can integrate into other academic areas, so students get a sense of how broadly applicable it is" (Valenzuela, 2020). However, students will not recognize this on their own, and educators need to be intentional about teaching it. In turn, we will help students be more intentional in their own lives and make deeper connections to their lives. Computer science encourages students to engage in real-world and personalized learning that keeps them intrinsically motivated, thoroughly engaged, and thinking at phenomenally high levels (PBS Education, 2018). In a sense, computer science is the foundation for all learning in school and beyond.

I have witnessed this during our schoolwide STEM days. Nearly four hundred K – 5 students rotate between various stations that include technology and "unplugged" activities. During this time, they create and collaborate with each other. They fail, and then they try again – and sometimes again and again. They design, engineer, and construct. They problem solve, persevere, innovate, and adapt. Most notably, *every* child fully engages, and not one behavior problem occurs. Students discover they can do things they never thought possible, and the more experiences students had with these opportunities, the more thoughtful, developed, innovative they became.

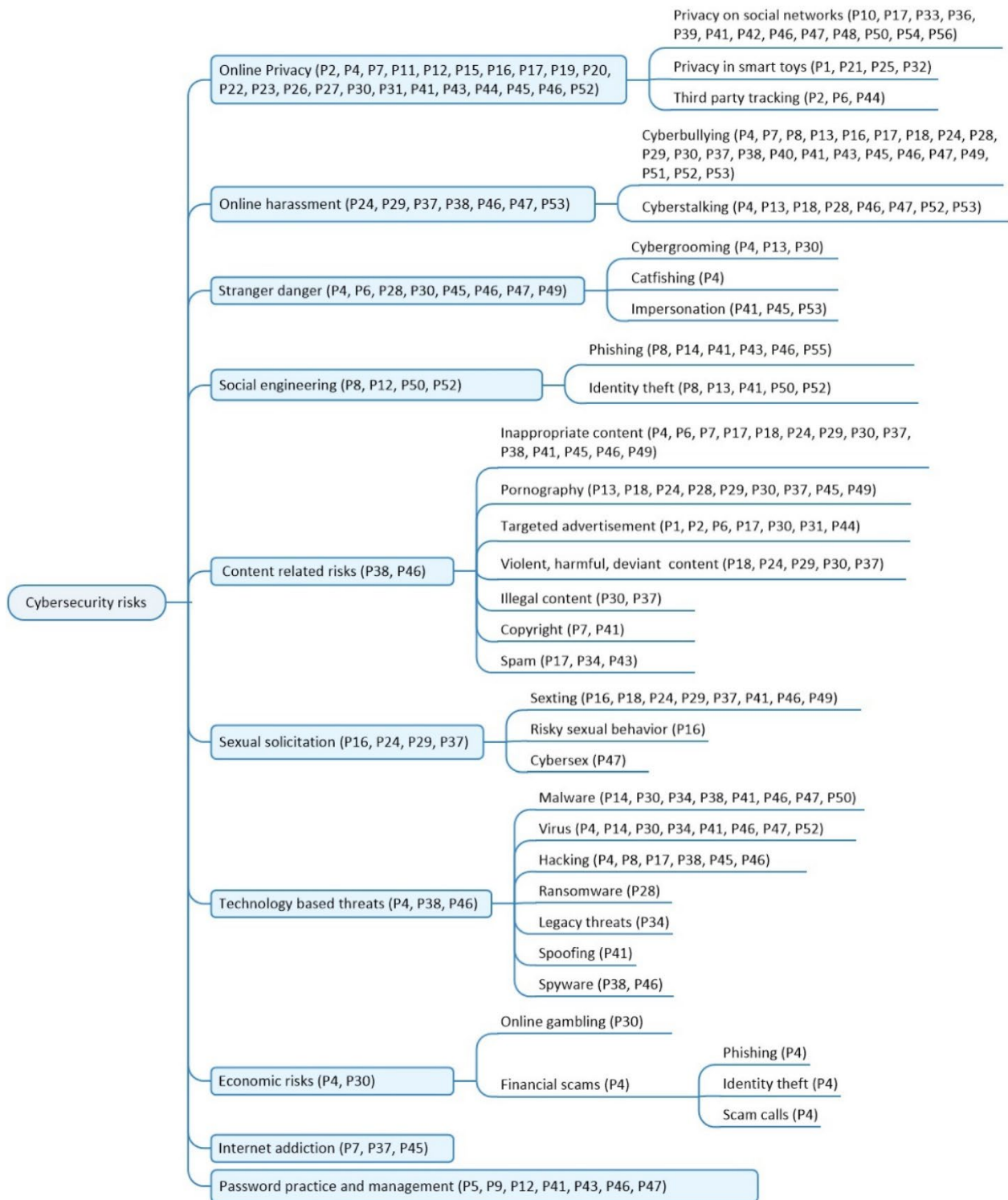
At this point, technology is not an optional component in schools. Although more districts are moving to personal devices, simply having devices does not guarantee computer science and cybersecurity education. Consequently, digital empowerment becomes an issue of digital disenfranchisement without sustained and intentional instruction. We cannot accept that it is a choice whether students receive this critical instruction especially considering the implications as digital space is where youth are spending an increasing portion of their lives. The

reality is children are developing more of their personal identity from online influences than ever before, and often without their knowledge. According to ParentCo. (2022), “children typically have a digital identity by the sixth month of their lives, although some may have one before they're even born including ultrasound images and other details. By the time they're old enough to sign up for their own accounts, they typically have about 2000 photos defining them online” (par. 8).

According to the International Journal of Child-Computer Interaction (2021), “risks have now become part of children’s everyday lives because they grow up immersed in technology to a degree that earlier generations would have found unimaginable” (p. 3). Our youth face issues such as privacy concerns, cyberbullying, content-related risks, internet addiction, and stranger danger on a daily basis (See Fig. 2). In fact, about one in four youth will experience identity theft or fraud before the reach the age of 18 because of online privacy risks including geo-tagging, data surveillance, targeted advertisement, audio injection attacks, and eavesdroppers (See Fig. 3). And students’ digital sphere keeps growing with easy access and minimal knowledge of the risks and long-term consequences.

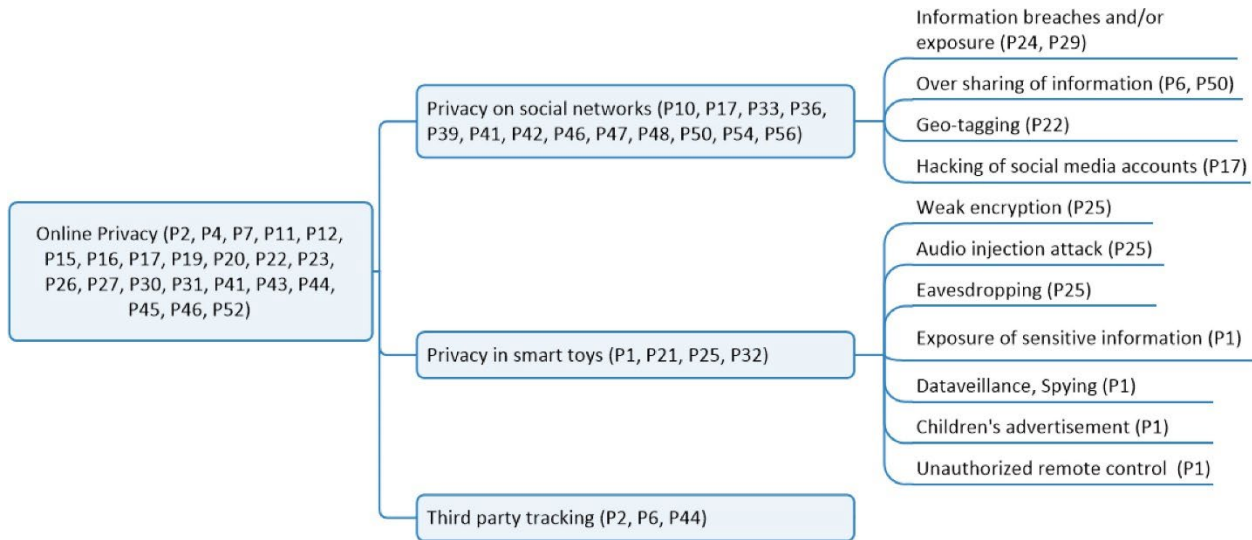
## **Figure 2**

*Cybersecurity Risks*



**Figure 3**

*Privacy-Related Risks*



Fortunately, the increased use of online educational tools creates the opportunity for educators to simultaneously teach students basic cybersecurity skills and encourage them to be experts themselves. Just as we teach washing hands and covering a cough, we need to teach digital hygiene. Just as we teach safety for riding bike and crossing the street, we need to teach cybereducation. Research has shown that explicit cybersecurity instruction will increase children’s privacy awareness, influence their online behavior, and heighten their cognition of risks and benefits using technology.

The duality of technology is undeniable. Because of technology, our children are faced with threats, but they are also met with limitless opportunities. Likewise, our attempts to keep students safe in the world do not transfer to the digital situations students encounter. Regardless of your personal thoughts about technology, the reality is, it is not going away. In fact, you if you grab your cell phone, you will be holding the oldest piece of technology that will ever be seen. Some may say, “But we always teach technology. After all, we do have computers in school.”

Sometimes it is said to be the hidden curriculum just like critical thinking, problem solving, and analytical reasoning. However, we can no longer afford to keep computer science and cybersecurity hidden. Teachers recognize the need for it. Parents are asking for it. Our kids deserve it. We owe students our commitment to *guarantee* computer science and cybersecurity education.

Mr. Chairman and Members of the Committee, that concludes my prepared testimony, and I will stand for any questions that you may have.

ComputerScience.org. (2021, September 28). *Computer Science Programs in North Dakota*.

<https://www.computerscience.org/online-degrees/north-dakota/#:~:text=Computer%20Science%20Careers%20in%20North%20Dakota&text=Graduates%20pursue%20roles%20as%20computer,grow%2013%25%20nationally%20by%202026>.

ParentCo., (2022, June). *How to help your child build and maintain a positive digital identity*.

<https://www.parent.com/blogs/conversations/how-to-help-your-child-build-and-maintain-a-positive-digital-identity>.

PBS Education. (2018, November 29). *Five steps for integrating computer science in the classroom*. <https://www.pbs.org/education/digitalinnovators>.

Quayyum, F., Cruzes, D. S., & Jaccheri, L. (2021). Cybersecurity awareness for children: A systematic literature review. *International Journal of Child-Computer Interaction*, 30(1), <https://doi.org/10.1016/j.ijcci.2021.100343>

Valenzuela, J. (2020, September 9). *3 ways to integrate computer science in other classes*. <https://www.edutopia.org/article>.

TESTIMONY OF  
MAJOR JAY SHELDON  
NORTH DAKOTA NATIONAL GUARD  
BEFORE THE  
HOUSE EDUCATION COMMITTEE  
14 FEBRUARY 2023  
HOUSE BILL 1398

Chairman Heinert and members of the committee, I am Jay Sheldon, Strategy and Policy Officer for the North Dakota National Guard (NDNG). I am here today to provide testimony in support of HB 1398.

In today's rapidly advancing technology landscape, computer science skills are in high demand across all industries, including the military. A strong understanding of computer science can open a wide range of career opportunities for students after graduation. An opportunity that we would like them to consider is the military, specifically the North Dakota Army and Air National Guard.

The National Guard would benefit from a computer education requirement in two ways. First, the NDNG has 31 (6 full-time and 25 part-time) open computer science related positions we are constantly trying to fill and second, the technology used in today's military requires many of our soldiers and airmen to be proficient in various computer science related tasks.

The North Dakota Army and Air National Guard employs 83 full-time and 291 part-time employees in information technology/computer science positions. As the military continues to grow its cyber security force there is a need to produce more individuals with these capabilities.

All military missions rely heavily on technology and computer systems for communication and navigation is critical for the military's long-term success. Unfortunately, current data of individuals that take the ASVAB, the standardized test used to assist the military with career placement, technology is area where local test takers have had lower performance, at least partially evident by our open positions.

A great way to grow the pool of people capable to fill the growing need is to expose them to computer science throughout their primary educational experience. To fill our positions and those across all industries we support HB 1398.

Thank you and I will stand for questions.



**TESTIMONY ON HB 1398  
HOUSE EDUCATION COMMITTEE**

**February 14, 2023**

**By: Gavin Kratcha, Student at Hankinson Public School  
701-899-2779**

Mr. Chairman and Members of the Committee:

My name is Gavin Kratcha. I am a Junior at Hankinson High School. I am here today to speak in favor of House Bill 1398 regarding Computer Science education.

With the pandemic, many of our students felt more isolated than ever. The pandemic left us with one of the most difficult times in Education in our nation's history. There is a lack of motivation. Students have less of a connection with our schools. Students feel more distanced from each other than they ever had. But with these hardships came a gift. This gift was the gift of technology. More people have access to technology and the internet at their fingertips than ever before. We used this gift in our schools to have lectures and assignments online, something that was new to all of us. Students use this technology every day, but they have never been taught how to use this technology to its fullest potential. Students and teachers dove into the world of technology so fast that, in many instances, they haven't been taught proper digital citizenship and cybersecurity.

This is a huge problem in our education system. Students must know how to use this technology properly to be able to use the technology to its fullest potential. This bill will help solve this problem. By requiring students to have one unit of computer science or cybersecurity, students will gain basic knowledge of how to use a computer properly with consideration to good cybersecurity. This will prepare them for their future lives, where technology will be used every day.

Technology also brings opportunities and programs to our students, who may not have these opportunities otherwise. I mentioned students' lack of engagement earlier. I believe that integrating computer science in all school districts could help this. I had the amazing opportunity to assist the technology coordinator in planning an Hour of Code program at our school. I worked closely with him to organize the event, and I had the chance to work with students of all ages to expose them to the great subject of computer science. I saw something quite profound that day. I saw students walk in with the same look we've all seen far too often. The look that shows a lack of engagement and motivation. The excitement just wasn't there. We started to show them all the different things there were to do. We showed them how to code a robot to make art. We made an obstacle course for a robot to navigate with the students' code. We had many different stations with all kinds of technology. We then got the students to try something, it didn't matter what the outcome was or how it worked, we just

wanted them to try. At the beginning, it was difficult to get the excitement, something we see a lot in education. But then the students started using the technology. We saw students that were deprived of excitement turn energetic. They had excitement, they had drive, they had motivation. They started to naturally work together and think creatively of how to solve the problem. It wasn't long before every student in that room was gleaming with excitement. With every new group, we heard the same thing from the teachers: they have never seen their students this excited, this engaged, and this motivated all year. By the end, they couldn't get their students to leave, they were too engaged and they wanted to try everything there. Every hour we saw the same process. Students entered, unmotivated and undriven. By the end, you couldn't get them away from the technology.

All it took was one hour. One hour of exposure to computer science for their mindset to flip. They were excited, driven, and happy. Now imagine if they had one hour of this every day for a year. Students would learn more about computers and computer science than ever before. There would be excitement and drive that we need so desperately. I believe that this bill has the potential to not only improve computer literacy and cybersecurity, but also give us more student engagement and a newfound source of opportunity for our students.

The purpose of our education is to prepare us for our future lives. Whether that is entering the job force, going to college, starting your own business, or

anything else, technology will be used in all aspects of our live. It would be an injustice to us, the students, to not teach us how to use this technology that we have at our disposal. We must teach students cybersecurity in order to stay safe in this increasingly digital world. We must also teach computer literacy so students know how to navigate this digital world. Teaching students basic computer science will give them a competitive edge and allow them to explore opportunities they previously didn't know existed. This is why I firmly believe that in order to say that we are preparing students for their future lives, we must educate all our students in computer science and cybersecurity.

This bill has the opportunity to give our students something amazing. This bill would give students the proper education in technology so that we can succeed in our future lives. This bill would help our students become more involved with school and give our students a way to engage with the technology we have. If we want us, the students, to be the most prepared and well-rounded students we can be, we must provide computer science education to every student.

Mr. Chairman and Members of the Committee, that concludes my prepared testimony. I will stand for any questions that you may have.

Testimony on HB 1398  
House Education Committee  
2.14.2023

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Chair Heinert and members of the House Education Committee,

Governor Burgum and his administration stand in support of House Bill 1398, which prioritizes cybersecurity and computer science in our K-12 classrooms.

This administration has placed a strong emphasis on the critical importance of computer science and cybersecurity. Through the establishment of the PK-20W Initiative (<https://www.ndit.nd.gov/pk-20w-initiative-computer-science-and-cyber-education>), the vision of “Every Student, Every School, Cyber Educated” ensures our students have the skills and knowledge to navigate a technology-driven economy.

While this concept has undergone many iterations, the current language provides local control while ensuring our students have the choice to access a course within this critical content area. In the past two years, students have been provided computers or other technology devices to engage in learning and education. With increased access, it is critical our students learn how to navigate technology and the online world by learning foundational skills around cyber safety, such as password phrases, safe websites and verified sources just to name a few.

Computer science and cyber education also provides another avenue for students to problem-solve, analyze data and use algorithmic thinking as well as other 21<sup>st</sup> century skills. When students experience learning through real-world application, it fuels curiosity and motivates the learner to become engaged.

Not only is the learning environment demanding that students have experiences around cybersecurity and computer science, but the prevalence of technology in our daily lives has become a direct factor in employability. Employers are increasingly seeking students prepared with the skillsets to navigate tech challenges and cyberattacks and complete daily tasks using technology devices.

As the first state with cybersecurity and computer science standards, North Dakota has the unique opportunity to continue to lead and ensure our students have every chance to rise to the top. With our collective support of HB 1398, we can fulfill the vision of Every Student, Every School, Cyber Educated.

Maria Neset  
Senior Policy Advisor  
Office of the Governor

## Additional Information

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### The Skills Gap is Growing:

- Predicted worldwide shortage of 3.5 million cybersecurity positions through 2025 ([Cybersecurity Ventures](#)); currently 715,348 cybersecurity openings nationwide ([Cyberseek](#)).
- Cybersecurity has a **virtually 0% unemployment rate**.
- A [2019 Presidential Executive Order](#) calls for increased focus on enhancing the United States' cybersecurity workforce as a strategic asset to protect national security.
- North Dakota's military footprint and national leadership in energy, agriculture and unmanned aircraft systems (UAS) are key economic drivers.
- Implementing and securing 21<sup>st</sup> century technology infrastructure will enable continued growth across public and private sectors, helping attract capital and talent to the state.

### Threats:

- Ransomware attacks are in the headlines daily with thousands of entities falling prey every year. School districts and government entities are prime targets for attacks.
- In the U.S., the average cost of a data breach is \$4.24 million (IBM and Ponemon report, August 2021, [What is the Cost of a Data Breach in 2021? | UpGuard](#). There is a hack every 39 seconds. - [Digital Guardian Blog](#)
- The global pandemic has increased cyberthreats due to the work-from-home shift.

### Computer Science:

As a broader field directly tied to dozens of technology-centric careers including cybersecurity, in the Computer Science realm:

- 90% of parents want computer science to be taught; only 51% of schools teach it. ([Code.org](#)).
- There are more than 695,077 computing jobs open nationwide, yet there were only 79,991 computer science graduates entering the workforce last year. ([Code.org](#)).

### In North Dakota:

- There are approximately 1,171 open cybersecurity jobs ([Cyberseek](#)) and 1,389 open computing jobs ([ND.pdf \(code.org\)](#)); however, recent data shows North Dakota had only 177 computer science graduates in the state. And the actual number of open computing jobs is likely significantly higher.
- According to [Code.org](#), the average salary for a computing occupation in North Dakota is \$73,102, which is significantly higher than the average salary in the state (\$48,130). Existing openings in cybersecurity and computing jobs combined represent a \$168 million opportunity in terms of annual salaries.



February 14, 2023

Re: Computer Science as a High School Graduation Requirement

Hello, Chairman Heinert and members of the House Education Committee:

My name is Jordan Zakery, and I serve as Regional Advocacy Director at ExcelinEd, a national nonpartisan education policy solutions tank founded by Governor Jeb Bush. Thank you for the opportunity to submit testimony regarding the benefits and current landscape of K-12 computer science as a course offering and/or graduation requirement in states across the nation.

Nationwide, five states are currently leading the charge in requiring computer science as a high school graduation requirement: South Carolina, Nevada, Arkansas, Nebraska and Tennessee. Altogether, 27 states have adopted policies that ensure high school students have access to computer science courses.

North Dakota currently allows two computer science courses—AP Computer Science A or Mathematics for Computer Science/Information Technology—to count as a mathematics credit toward graduation. The legislation you are now considering would make computer science a graduation requirement by allowing students to receive credit in mathematics or science, or both, by completing approved computer science courses.

To be prepared for success in the 21st century workplace and a technology economy, today's students need access to coursework that builds relevant, in-demand skills and credentials. Such skills can also lead to higher-quality, higher-wage jobs. According to the Brookings Institution's Hamilton Project, a college graduate with a computer science major can earn 40 percent more than the college average. Currently, computing occupations are the number one source of new wages in America—that's 16 percent of all new wages.

In North Dakota alone, the Technology Council of North Dakota has identified more than 4,100 businesses within the tech subsectors that employ more than 21,000 North Dakotans in various fields. Over the last ten years, the contribution of the technology subsectors to North Dakota's GDP almost doubled, growing by 39 percent.



Support among educators and parents for computer science access is also high. Gallup reports that 90 percent of parents want their children to learn computer science, while only 53 percent of schools nationwide offer computer science. According to data from code.org, 83 percent of parents and 64 percent of students in rural and small towns believe offering computer science is more or equally important as any required course.

Establishing policy that requires computer science as a graduation requirement is a visionary investment. It benefits not only today's students but also grows a state's workforce and economy and helps build the state's long-term success. Thank you for graciously allowing us to contribute testimony.

Respectfully,

Jordan Zakery





# North Dakota Small Organized Schools

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HB 1398– Testimony in Support  
House Education Committee  
Representative Heinert – Chairman  
February 14, 2023

Representative Heinert and members of the House Education Committee, my name is Michael Heilman. I am the Executive Director of the North Dakota Small Organized Schools (NDSOS). I represent 150-member school districts of the North Dakota Small Organized Schools. NDSOS stands in support of HB 1398 with the addition of the proposed amendment allowing for the integration of this curriculum as approved by the local school board.

There is no question that the availability of computer science and specifically cybersecurity education is important. Our schools can be a critical link in ensuring that students are given exposure, awareness and a career pathway if they choose. What we struggle with, especially our small schools, is finding the staff and the time to add another requirement. We continue to add, but seldom do we remove a requirement. Yes, we make concessions by allowing substitutions, which personally I appreciate and am in favor of, as it allows students to personalize their education to meet their needs. My concern is that additional requirements make personalization more difficult and why I support that addition of the integration plan language to this bill.

As we add requirements and alternative pathways to graduation, we also need to change the measures that assess what is a successful school. While at Century High School we took an in-depth look at the ACT exam and the math and science instruction. The math department discovered that many of our students were missing questions related to a particular math concept. The reason being, students in the typical math track (Algebra I, Geometry, Algebra II) were not receiving instruction in that concept until after the ACT was taken. Additionally, students taking an alternative math track may never be exposed to the concept.

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**The mission of NDSOS is to provide leadership for the small/rural schools in North Dakota and to support legislation favorable to their philosophy while opposing legislation that is harmful.**

At the elementary level additional requirements take minutes of instruction away from math and reading and these are curricula that are the most tested and most highly scrutinized. Our schools and the curriculum that is taught needs to evolve with the world we live in and so should the measures we use to judge a school's success.

NDSOS stands in favor of HB 1398 with the proposed amendment allowing for a locally approved integration plan.

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Testimony in Support  
**House Bill No. 1398**  
House Education Committee  
February 14, 2023

## TESTIMONY OF

### **Katie Ralston Howe, Director, Workforce Development Division**

Chair Heinert and members of the House Education Committee. My name is Katie Ralston Howe, workforce director for the North Dakota Department of Commerce. In my role, I also have the pleasure of serving as the director of the industry-led Workforce Development Council. I'm here in support of House Bill 1398.

Lack of available workforce is arguably one of North Dakota's greatest challenges right now. The problem is multifaceted and centered around a lack of people and a mismatch of skills needed to fill our open jobs. Preparing for the workforce starts with our youngest learners and it's important that we give them opportunities to develop the skills they need to be successful when they enter the world of work.

By ensuring all students take computer science and cybersecurity courses throughout their education we will prevent a problem that we're facing today: adult jobseekers and workers who lack foundational digital literacy skills. In November 2021, ND was one of six states accepted to the National Governors Association Workforce Innovation Network, which focused on digital equity infrastructure and skill development for our adult population. We learned that 32% of unemployed adults in our state lack digital skills which is disqualifying them from 72.2% of open jobs right now. What this number doesn't speak to are the number of employed individuals who struggle in their work, because they don't have the basic computer and cybersecurity skills needed to perform daily functions using the technology they have at their fingertips. That's an incredible skill mismatch and one that we need to address. Through our research, we identified that all the jobs on our "in-demand" occupations list require digital skills, and many require intermediate to advanced digital skills. We also found that higher levels of digital skill in occupations in ND are associated with higher incomes. In fact, changing to an occupation that requires higher levels of digital skills can increase annual income by an average of \$660 per year.

Today, nearly every job is an IT job and reliance on technology will increase across all industries. When reviewing North Dakota's most in-demand jobs, it's easy to see how nearly all interact with technology through the devices used, email and the internet, not just in the work that's performed in these jobs, but in the job application process and in the training programs designed to prepare workers in these fields. Having foundational digital skills is already expected in the same way as strong communication skills, ability to work with others, punctuality, and more, and it's important that we equip all North Dakotans for success in the workplace.

I'd like to highlight that the opportunity presented in Section 4 of HB 1398 to provide resources to communities of all sizes to help adult learners, jobseekers, and workers advance their digital skillsets to enhance their participation the labor market is aligned with one of the recommendations included in our NGA report. It also aligns well with requirements under the Digital Equity Act.

By passing HB 1398, we will support the creation of a talent pipeline that has the skills that ND employers need to fill their open jobs, maintain operations, and grow, while ensuring ND workers

remain competitive in a global economy. Thank you for the opportunity to share my support for this bill. I am happy to answer your questions.

**Testimony of Kirsten Baesler**  
**North Dakota Superintendent of Public Instruction**  
**House Education Committee**  
**In Support of HB 1398**  
**Tuesday, Feb 14, 2023**

Chairman Heinert and members of the House Education Committee.

My name is Kirsten Baesler. I am the North Dakota Superintendent of Public Instruction, and I am here to speak in support of House Bill 1398.

Good morning, everyone. It has been a while since I have been in front of you. The last time was during the NDDPI presentation during the first days of the session. During that first day, I said you would not see me testify often – and that the NDDPI team would provide **information** on the bills you consider instead of giving testimony in “opposition to” or “support of” legislation.

I said that day that the only bills you will likely hear me take a position on are those that will have a DIRECT impact on children and their future.

This is one of those issues.

The ND Constitution, Article V Section 2, explicitly identifies the Superintendent of Public Instruction as the constitutional officer overseeing public education in our state, acting only through the authority prescribed by law through the legislative assembly.

Article VIII Section 1 of the North Dakota Constitution states that the **Legislative Assembly** “shall make provision for the establishment of a **system** of public schools which shall be open to all children of the state of North Dakota...” and Section 2, “The legislative assembly **shall** provide for a uniform system of free

public schools throughout the state, beginning with the primary and extending through all grades up to and including schools of higher education...”

What this means is that the **legislative assembly** is the primary stakeholder in the state’s public education system. The Superintendent of Public Instruction is a secondary stakeholder overseeing the execution of the state’s K12 education laws and expectations, acting only on the authority prescribed by the legislative assembly.

An important contributor to implementing the will of the legislative assembly is the public school systems, including teachers, administrators, school boards, and all school staff in partnership with parents.

As the bill’s sponsor said during its introduction, during the 2021 special session, HB 1507 was passed, in which a new duty was added to NDCC 15.1-02-04, the Superintendent of public instruction – Duties. The new **requirement** that the legislative assembly directed that its constitutional officer accomplish stated that the Superintendent “**Shall** collaborate with workforce development stakeholders and the kindergarten through grade twelve education coordination council to determine how best to integrate computer science and cybersecurity into elementary, middle, and high school.”

The directive given by the legislative assembly wasn’t “if” this should be done. It wasn’t a study to consider this. It is a clear directive to work together to determine “how to best” get it done.

I took that directive seriously, and a task force was formed. The many groups who contributed to this bill worked hard to collaborate and compromise to deliver this solution to you.

I ask that you do not amend the bill except for the amendments suggested by the bill sponsor, to insert a section of the bill that was inadvertently omitted by the legislative council during official drafting, and allow guidance to be written to enable efficient delivery of the grant funding. What you see before you is the result of over a year of meetings, statewide travel, and, simply put, a **long journey** to find language that is acceptable to our educators, business chambers, cyber defense experts, industry, and families. But **most importantly**, what you have is a bill that serves the needs of our children based on the needs of **their** future.

Here is a summary of the history of this journey.

### **History of Computer Science and Cybersecurity Timeline**

**October 2015** – North Dakota Department of Public Instruction forms a working group of diverse stakeholders, including legislators, to work on a plan for K-12 education relating to computer science and cybersecurity needs.

**January 2017** – Working group presents the plan to the 2017 Legislative Assembly.

**September 2018** – North Dakota computer science and cybersecurity educators from our K-12 schools and university system, as well as industry experts, began developing CS and Cybersecurity Standards. The writing committee's draft was made available for public comment, which generated valuable opinions from

teachers, administrators, parents, and the community. A panel of business and community leaders and public representatives provided another layer of review.

**February 2019** – North Dakota adopted the nation’s first K-12 Computer Science & Cybersecurity Standards.

<https://www.nd.gov/dpi/sites/www/files/documents/Academic%20Support/CSCS2019.pdf>

**April 2019** - The 2019 legislative assembly gave the superintendent of public instruction authority to create computer science and cybersecurity credentials for educators to add to their teaching licenses.

**April 2020** – ND Administrative Code 67-11-22 established three levels of CS and Cybersecurity Credentials

- Level 3 – allows integration of CS/Cyber within other content areas.
- Level 2 – allows teaching of intro level CS/Cyber courses.
- Level 1 – allows teaching of more advanced CS/cyber courses that result in Carnegie course credits

**Nov 2021** – conclusion of 67<sup>th</sup> Special Session

- Tasked the State Superintendent to “collaborate with workforce development stakeholders and the kindergarten through grade twelve education coordination council to determine how best to integrate computer science and cybersecurity
- Established co-chairs of the task force.
  - ✓ James Leiman - Commissioner, Department of Commerce
  - ✓ Shawn Riley – State Chief Information Officer
  - ✓ Kirsten Baesler – State Superintendent



**December 2021** – Identified task force members to ensure all impacted/concerned entities were represented

**Feb 2022** - Initial Meeting

- Divided into subcommittees.
  1. Technical Subcommittee
  2. Awareness Subcommittee

**Mar/Apr 2022** – established document repositories and email channels to drive future agendas.

**May 6, 2022** – Technical Subcommittee meeting

**May 13, 2022** – Awareness subcommittee meeting

- Subcommittees looked at the needs of:
  1. Students – how to best prepare them for future success regardless of career path.
  2. Current teachers – what support and professional development are required?
  3. Preservice teachers – how to prepare them to educate the 21<sup>st</sup>-century student.
  4. School administration – how to ease their burden and allow for differences at each location.

**Jun/Jul/Aug – 2022**- worked on shared documents/drove to upcoming meeting agenda.

**Aug 3, 2022** – Full task force meeting

- Reviewed discussions and recommendations from each subcommittee.
- Formulated final recommendations.

**September 2022** – task force finalized recommendations and verified consensus among members.

**October 2022** - presented final recommendations to Legislative Interim Policy Committee.

- Interim committee requested more work be done to provide compromise and a higher degree of comfort among school administrators and directed Superintendent Baesler to bring it back to the legislative assembly during the 2023 regular session.

**October 2022- January 2023** – Superintendent Baesler travels to meet with numerous stakeholders across the state, including school administrators, principals, teachers, families, and business leaders, to develop consensus on the bill’s language.

A copy of the task force members and their September 2022 recommendations are provided with this testimony.

This process and the resulting language in this bill are the perfect examples of complying with the ND Constitution and honoring the tradition of local control.

1. The Legislative assembly has the right – and the responsibility - to establish expectations for a uniform education system available to all children.
2. The constitution directs the assembly to prescribe laws for the Superintendent of public instruction to execute and achieve those expectations.
3. Local control is provided for local school boards, administrators, and teachers to decide how to best implement daily operations to meet the state’s expectations.

During this process, one thing that was clear among all participants – no one, not a single task force member or any stakeholder member I talked to during this journey, has disagreed with the **importance** of ensuring that all students have access to and receive instruction in computer science and cybersecurity. In fact, they all agree wholeheartedly that it is very important. The challenge came when the discussion turned to what adults must do to make that happen for our students. That's when the discussion got hard. And it got hard because it required adults to do something different, to figure out a way to do something differently, and think about schedules, training, and delivery differently. Doing something different is not always easy. I get that, and I understand that. But student outcomes don't change -will never change - until adult behaviors change. And public education is not here to serve the needs of adults; it exists to prepare students for their future. If we all agree that it is the right thing to do, but we don't do it because it is hard – then shame on us. Adults must find the answer that is best for children, not adults.

To demonstrate how solutions can be and have been found, I share with you an exchange that I had with one educational leader:

1. A graduate today should have a background in computer science and especially cyber security. Ask employers about how much money they spend on cyber security.
2. But these are some problems posed to me by colleagues and maybe something for you to think about solving:
  - a. financial burden on small schools that will have to pay ND Center for Distance Ed to offer the course. How can we help these schools? My cousin's kids go to a small school in SW ND, and should have the same opportunities as mine. **For the 2023-2025 biennium, NDDPI has allocated \$600,000 from its ESSER (Covid funding) to grant to NDCDE to cover the Center's estimated costs to educate students who do**

not have a teacher in their school to teach the course. Covering this first biennium will give schools time to get one of their teachers trained and will provide time to determine a baseline amount of funding that CDE would need in the future to continue this support to our small schools for this course.

- b. Personnel problems in schools the size of XXX. We may now have extra science teachers because kids won't take as many science classes, but we will need to train or hire someone new. Could we offer some training with pay in the summer for teachers who want to become credentialed? DPI is allocating \$2M in ESSER funding to train and credential one CSC teacher per 200 students. This equates to 720 teachers across ND. We currently have more than 400 credentialed teachers.
  - i. For the past two summers (2021, 2022), NDDPI and NDIT EduTech have partnered with Bismarck State College to host a 4-day IgniteND Summit on BSC Campus. After those four days, teachers will have enough hours to have earned their Level III Computer Science and Cybersecurity Credential to add to their teaching license. NDDPI provides scholarships to all interested teachers that cover the cost of registration, BSC housing, and food and pays the teacher a \$500 stipend for their time. IgniteND 2023 Summit will be held this June again.
  - ii. ND Dept of Commerce has scholarships available to teachers wishing to complete the Cyber Educator training program at BSC.
  - iii. NDIT EduTech has dozens of courses - most at \$0 cost and available online – that educators can take to get credentialed. See here for a list [NDIT-EduTech Training](#)
- c. We FINALLY have a computer science teacher at XHS, after being unable to find someone for multiple years. Imagine a Beulah or Scranton trying to find someone. If we require this for graduation, we will have to train or hire someone besides our existing teacher. What happens if we can't find anyone who wants the training? If a school district cannot find a willing teacher to receive training, then CDE could be utilized. Another option might be to leverage the Community Expert teacher authorized under 15.1-18-10 or the Learn

Everywhere opportunities authorized under 15.1-07-35 to meet the requirements of this bill.

- i. I say this realizing my hypocrisy in that in business and industry if the organization doesn't adapt, it dies. We are training kids for the real world!

Educators will say you are taking local control away from School Boards. The legislative assembly has always set the minimum expectations of what schools must offer to be approved to operate in North Dakota. These are listed in 15.1-21-01 (Required Instruction) and 15.1-21-02 (Required Units.) Further, the state legislature has always been the authority in determining the minimum requirements for students to earn a North Dakota high school diploma, 15.1-21-02.2. This is to fulfill Article VIII of our State Constitutions that states, "The legislative assembly shall make provision for the establishment and maintenance of a system of public schools which shall be open to all children of the state of North Dakota ...." And "The legislative assembly shall provide for a uniform system of free public schools throughout the state,"

This bill does respect the long-standing tradition of local control by allowing school boards to decide how to meet the basic requirements set forth by the legislative assembly by developing a Computer Science Cyber Security integration plan that fits the local context of each community. The language in the bill states, "Develop a computer science and cybersecurity integration plan to ensure introduction to computer science and cybersecurity knowledge. The board of the public school or school district shall approve a plan by July 1, 2024."

Members of the Committee, North Dakota must keep its children from falling further behind. Other states and countries already require this. As the bill sponsor mentioned earlier, 25 out of 29 European countries have computer science in their mandatory curriculum, with 17 countries making it mandatory in both primary and secondary schools.

Five states require computer science for graduation, and that number is growing. Since the 2021 special legislative assembly added this to the superintendent's duties, state legislatures across the U.S. have enacted laws to make this a requirement, and more are considering it this winter.

You have heard that this learning is foundational. It is imperative to our children's success – and safety. One of the most common kindergarten activities is to have the students plant a seed in a cup of soil at the beginning of the year. We do because we want them to know that a seed that is placed in soil, when given the right of sunlight and water, grows into a plant that becomes our food. We don't do this because we want all 5-year-olds to grow up to be farmers or agronomists. We do it because food is a part of every child's daily life, and they need to understand how it works. Every fifth-grade student learns about electricity and the electrical circuit. We don't do this because we want them to grow up to be electricians or electrical engineers. We do it because they need to know how that powerful element in our lives can be harnessed for good to help improve our lives instead of hurting us. We have come to that point with computer science and cybersecurity. It is part of our everyday lives. We need to know how and why it works. And we need to teach our children how to harness it for good, not let it hurt them.

You have heard about some good programs today. And I, too, get to see many good programs in the state, but after nearly eight years of incentivizing and providing state support to scale and grow access to computer science, only 44% of ND high schools even offer a computer science course – which is below the national average. It is right for the legislative assembly to exercise its

constitutional responsibility to establish the expectations of every school to establish a uniform education system available to ALL students. Every child has ability – but what they lack most severely in rural states like North Dakota is **access to opportunity!**

The state with the highest number of computer science or cyber security jobs in the nation is California. That makes sense with Silicon Valley, right? But guess what location is the second highest? It's remote. You can work from anywhere. You can ranch your family's land, volunteer for the community fire department or ambulance service, and still make \$70-\$80,000 a year. Imagine what this could mean to our young people and to this state. While over 14,000 Native American students attend high schools in North Dakota (11.13% of the population), only 133 are taking a computer science course. We should not be satisfied with that number. We can do better.

We have reached a point where computer science and cybersecurity are as important as reading and mastery of 8<sup>th</sup>-grade math became in the early 1900s. Student outcomes don't change until adult behaviors change.

Mr. Chairman and members of the committee, I urge a "do pass" vote on HB 1398.

I welcome any questions you may have.

## Every Student, Cyber Literate Act

### 2021-2022 school year

- 89 high schools (of 177 public and 16 nonpublic schools) offered CS and Cybersecurity courses
- 6,850 (of 117,000 public and 8,500 nonpublic students) took CS and Cyber courses

### Definitions

**Computer Science** refers to the study of computers and algorithmic processes, including their principles, their hardware and software designs, their [implementation], and their impact on society.

**Educational Technology** is the process of integrating technology into education in a way that promotes a more diverse learning environment and a way for students to learn how to use technology as well as their common assignments.

**Digital Citizenship** refers to the appropriate and responsible use of technology, such as choosing an appropriate password and keeping it secure.

**Information Technology** often overlaps with computer science but is mainly focused on industrial applications of computer science, such as installing and operating software rather than creating it. Information technology professionals often have a background in computer science.

**Computational Thinking** is a way of solving problems, designing systems, and understanding human behavior that draws on concepts fundamental to computer science. Defining characteristics of computational thinking include comprehension of algorithms as well as decomposition, pattern recognition, and data representation.

**Cybersecurity** is a set of techniques used to protect the integrity of networks, programs, and data from attack, damage, or unauthorized access.



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Elementary Principal, Devils Lake	Dawn Johnson	<a href="mailto:dawn.johnson@dlschools.org">dawn.johnson@dlschools.org</a>
Secondary Principal, Dickinson	Kevin Hoherz	<a href="mailto:khoherz@dpsnd.org">khoherz@dpsnd.org</a>
Elementary Teacher, Park River	Jana Gudmundson	<a href="mailto:jana.gudmundson@parkriverk12.com">jana.gudmundson@parkriverk12.com</a>
Middle/High School Teacher, Grand Forks	Paul Zettler	<a href="mailto:pzettler270@mygfschools.org">pzettler270@mygfschools.org</a>
District Specialist, Bismarck	Misti Frink	<a href="mailto:misti_frink@bismarckschools.org">misti_frink@bismarckschools.org</a>
School Board Member, Mott	Lucas Greff	<a href="mailto:lucasgreff@yahoo.com">lucasgreff@yahoo.com</a>
Family Stakeholder	Mike McHugh	<a href="mailto:mmchugh@nd.gov">mmchugh@nd.gov</a>
Student Stakeholder, Fargo Davies High School	Zoe Bundy	<a href="mailto:zoerbundy@gmail.com">zoerbundy@gmail.com</a>
SUPPORT STAFF		
NDIT-EduTech	Rosi Kloberdanz	<a href="mailto:rosi.kloberdanz@k12.nd.us">rosi.kloberdanz@k12.nd.us</a>
NDIT-EduTech	Tabitha Teel	<a href="mailto:tabitha.teel@k12.nd.us">tabitha.teel@k12.nd.us</a>
Department of Public Instruction	Steve Snow	<a href="mailto:fsnow@nd.gov">fsnow@nd.gov</a>
Workforce Development	Katie Ralston	<a href="mailto:keralston@nd.gov">keralston@nd.gov</a>
Center for Distance Education	Matt Lonn	<a href="mailto:matthew.lonn@k12.nd.us">matthew.lonn@k12.nd.us</a>
Education Standards & Practices Board	Rebecca Pitkin	<a href="mailto:rpitkin@nd.gov">rpitkin@nd.gov</a>
Department of Career & Technical Education	Tracy Becker Tracy Foss	<a href="mailto:tmbecker@nd.gov">tmbecker@nd.gov</a> <a href="mailto:trfoss@nd.gov">trfoss@nd.gov</a>
Technology Council of ND (TechND)	John Suter	<a href="mailto:office@technd.org">office@technd.org</a>
Governor's Office	Maria Neset	<a href="mailto:mneset@nd.gov">mneset@nd.gov</a>
Department of Public Instruction	Angie Thomas	<a href="mailto:afthomas@nd.gov">afthomas@nd.gov</a>

## CS and Cybersecurity Taskforce – Synopsis of Recommendations

### Importance of CS and Cybersecurity

Unanimous consensus among the group that Computer Science and Cybersecurity has become foundational knowledge for all K12 students regardless of the occupation they pursue.

### Implementation of CS and Cybersecurity

**Concern:** Larger schools have the available staffing to offer courses in CS and Cyber while smaller schools don't have the same staffing levels; this puts students who attend these smaller schools at a disadvantage

**Solution:** Center for Distance Education (CDE) can fill that void; CDE has committed to adding staff as needed to offer CS and Cyber courses

**Concern:** Integration of CS and Cybersecurity standards into other content areas may have a longer lasting, wider affect than a few stand-alone courses

**Concern:** Each district has different strengths and weaknesses; a 'one-size fits all' integration plan won't work for everyone

**Solution:** Each district can develop their own plan to integrate CS and Cybersecurity Standards

2. The school board, will approve each district's integration plan. (After meeting with ND School Board representative this was changed to be approved at the local district level. This aligns with the Learning Continuum Graduation Pathway philosophy of local approval.)
3. EduTech will develop template integration plans and a rubric that may be used for evaluating each district's plan. Development of the templates and rubric will occur with input from:
  - ND Department of Public Instruction.
  - The ND CS/Cyber Integration Taskforce.
  - The ND K-20W Working Group.
  - Other non-profit K-12 computer science and cybersecurity educational partners.
4. Key categories within the templates and rubric will include, but will not be limited to:
  - Computer Science and Cybersecurity Curriculum Integration
  - Teacher Training and Certifications/Certificates
  - After-school programs or clubs
  - Cyber Hygiene Programs for Staff Safety
5. The rubric is to ensure both awareness and technical application of computer science and cybersecurity knowledge is being integrated.

**Concern:** Adding another course requirement will take away from other electives

**Solution:**

1. CS and Cybersecurity course work could qualify for existing Math and/or Science courses therefore elective options wouldn't be impacted.

2. The integration of CS and Cybersecurity standards into other content areas allows students to receive some knowledge of CS and Cybersecurity while taking other math, science or electives.

**Concern:** How fast would this change need to be in place?

**Solution:** The course offerings (with the help of CDE) could be made available immediately; the integration plan would have a phased (multi-year) implementation.

1. The sample timeline for Every Student, Cyber Literate Act will be as follows:
  - Rubric developed and delivered to school districts by January 2023
  - School district implementation plans due to **School Board** by December 2023
  - School districts to begin implementing integration plan by 2024-2025 school year
2. The schools will utilize their Continuous Improvement Strategy Map for self-evaluation of their integration plan annually with formal review of the district implementation plan every three years by the board.

**Concern:** How will teachers receive training and professional development?

**Solution:** EduTech (a division of NDIT) has been providing training to school staff in the areas of CS and Cyber. They have been actively promoting their willingness to bring the training to schools.

Currently, over 400 ND teachers have received a CS or Cyber credential to add to their license.

EduTech has multiple training paths and work with schools to adapt their training to the specific needs of the schools.

Bismarck State College has developed a professional development track to provide teachers knowledge and skills to teach CS and Cybersecurity. Other ND colleges are developing similar programs.

Microsoft TEALS program places industry professionals alongside teachers for multiple years to jointly provide content with the intent of providing teachers knowledge and confidence to teach on their own

**Concern:** Cost to implement?

**Solution:** Funding awarded to NDIT (*grant directly to EduTech*) from NDDPI for purpose of providing professional development in computer science and cybersecurity, paying educators \$500 stipend and covering all registration and lodging costs.

**Concern:** What is the credentialing requirement?

**Solution:** Elementary and Middle school teachers – recommend a CS and Cyber Level 3 or Level 2 credential, but not required

High school teachers – recommend a CS and Cyber Level 2 or Level 1 credential, but not required unless teaching a standalone course

TESTIMONY OF  
DARIN HANSON  
NORTH DAKOTA DEPARTMENT OF EMERGENCY SERVICES  
HOMELAND SECURITY DIVISION  
BEFORE THE  
HOUSE EDUCATION COMMITTEE  
14 FEBRUARY 2023  
HOUSE BILL 1398

Chairman Heinert and members of the committee, I am Darin Hanson, Homeland Security Division Director at the North Dakota North Dakota Department of Emergency Services (NDDDES) and I am here today in support of HB 1398. Plainly and clearly, cybersecurity is homeland security.

As cyber criminals conduct non-stop attacks against our citizens and critical infrastructure, nation states stand poised to probe and attack the same targets in modern grey zone warfare. Like our ongoing efforts to build a society prepared for natural disasters and other emergencies, we need a populace who knows how to avoid being involved in a cybersecurity incident. The most effective way we can do this is by ensuring that proper cyber hygiene is followed by all our citizens. We are only as strong as our weakest link.

Meanwhile, cyber-attacks continue to increase, impacting the critical infrastructure our citizens rely on. As the state agency responsible for coordinating response and recovery to cyber emergencies external to the state's own network, it is imperative that we first focus our efforts on avoiding cyber incidents in the first place. Make no mistake, we will pay the price for cyber attacks one way or another. It can be on the front end through investing in our citizens and future workforce through cyber education, or we can pay for it in response and recovery costs.

As we move forward in this new future where cyber threats and attacks become a larger part of the NDDDES mission, it is important to recognize that we will need both a cyber ready workforce within the agency and also a cadre of cyber experts ready to assist in the response to cyber-attacks. NDDDES has just begun to establish a voluntary Cyber Incident Support Team and is working with the ND Department of Information Technology and other stakeholders to move this much needed capability forward. This bill will both support efforts to prevent an incident response and increase the pool of cyber professionals we can call on to support missions across the state.

HB1398 furthers the advancement of existing efforts at the NDDDES such as support for CyberCon, Cyber Madness, the State & Local Cybersecurity Grant Program, and portions of State Homeland Security Grant funds that are set aside for advancing cybersecurity across North Dakota. Let's continue to show the country and world that North Dakota is the most cyber ready state by voting Do Pass on HB1398.

Mr. Chairman, that completes my testimony, and I will stand by for any questions that you may have. Thank you for your time and the opportunity to speak today.



EMERGING PRAIRIE

February 14, 2023

Subject: Letter of Support for HB 1398

Mr. Chairman and Members of the House Education Committee,

Emerging Prairie supports House Bill 1398 and its goal to increase computer science and cybersecurity education in North Dakota.

Emerging Prairie energizes communities. We believe that as we weave the startup, innovation, and technology ecosystems together and move them forward, we will be able to maximize the state's potential and see catalytic community and economic development.

In our work helping to build the technology ecosystem in our state, through efforts such as Emerging Digital Academy, we have seen the positive impact of those entering the technology field. From life-changing opportunities, to the advancement of key industries, to the ripple effects in their communities.

All of this has been made possible through education, and we believe that to continue building a successful technology ecosystem in an ever technical and digital world, we need to provide as many tools as possible to those curious learners who are our state's future. Tools such as increased access to computer science education.

For these reasons, Emerging Prairie supports this legislation.

Sincerely,

Greg Tehven  
CEO & Co-founder  
Emerging Prairie



Sixty-eighth  
Legislative Assembly

- 1. (4) Career and technical education courses; ~~and~~
- 2. g Any five additional units; and
- 3. h. One unit of computer science or cybersecurity whether under subdivision b, c, or
- 4. both.
- 5. 2. If approved by the board of a school district or nonpublic school, a school district or
- 6. nonpublic school may develop eligibility criteria or programmatic requirements to allow
- 7. a passing score on the relevant portions of the GED assessment to receive credit for
- 8. the corresponding requirements of subdivisions a through d of subsection 1.

9. **SECTION 4.** A new section to chapter 15.1-26 of the North Dakota Century Code is created  
 10. and enacted as follows:

11. **Authority - Adult learning - Computer operations and cybersecurity instruction.**

12. The superintendent of public instruction shall provide grants not to exceed \$300,000 total to  
 13. school districts, nonpublic schools, area career and technology centers, job service North Dakota  
 14. workforce centers, public libraries, ~~and~~ adult education centers and 501 (c)(3) learning centers to  
 15. offer computer operations and cybersecurity courses for adults, for the biennium beginning July  
 16. 1, 2023, and ending June 30, 2025.

17. School districts, nonpublic schools, public libraries, area career and technology centers, job  
 18. service North Dakota workforce centers, ~~and~~ adult education centers and 501 (c)(3) learning  
 19. centers shall use all or part of the grant money to pay a stipend to a teacher of the course.

20. The superintendent of public instruction shall adopt rules to implement the grant program.

21. **SECTION 5. EXPIRATION DATE.** Section 4 of this Act is effective through June 30, 2025  
 22. and after that date is ineffective.

CS / Cybersecurity Bill \_\_\_\_\_ Rep. Mike Lefor Testimony

During the 2021 special session, HB 1507 passed, in which a new duty was added to NDCC 15.1-02-04 Superintendent of public instruction – Duties. The new requirement stated that the Superintendent “Shall collaborate with workforce development stakeholders and the kindergarten through grade twelve education coordination council to determine how best to integrate computer science and cybersecurity into elementary, middle, and high school curriculum under sections 15.1 - 21 - 01 and 15.1 - 21 - 02.”

The Superintendent convened a taskforce to determine the best way forward to integrate Computer Science and Cybersecurity instruction into all ND Schools. The task force consisted of representatives from workforce, ND legislators, school superintendents, principals from large and small districts (high school, middle and elementary schools), school board members, family members and students.

Unanimous consensus was reached among the group that Computer Science and Cybersecurity has become foundational knowledge for all K12 students regardless of the occupation they pursue. The ultimate result of this work is HB 1398.

I will describe the provisions of HB 1398, which are based on the recommendations of the task force I described a moment ago and individual one-on-one work done by the Superintendent with various school leaders across the state to fulfill the duty that was added to 15.1-02-04.

Section 1 of the bill requires Elementary and Middle Schools to provide instruction in computer science and cybersecurity. This means any school, in order for it to be approved to operate in ND, must make available computer science and cyber security instruction. This is the same section that requires that schools provide instruction in math, reading, social studies, health, phy ed, etc. If a school cannot find a teacher to offer any of these classes, they typically turn to the ND Center for Distance Education (CDE) to provide the instruction so the school can continue to operate. The North Dakota Center for Distance Education has confirmed that they will provide the staffing to offer these courses for schools that need them. I believe the Director of CDE will be testifying today.

Section one of the bill also requires elementary and middle schools to develop a computer science and cybersecurity integration plan to ensure introduction to foundational computer science and cybersecurity knowledge. These integration plans are approved by each local school board to ensure that each district has the flexibility to develop a plan that fits into their unique situations. Plans would have to be developed and approved by local school boards no later than July 1, 2024.

Section 2 of the bill requires high schools to make available one unit (credit) of either computer science or cybersecurity. Again, in order for a school to be approved to operate in ND, it must make available a computer science and cyber security course. This is the same section that requires that high schools provide courses in algebra, biology, and electives such as music, foreign language, etc. The North Dakota Center for Distance Education has confirmed that they will provide the staffing to offer these courses for schools that need



them. This section also requires high schools to develop a computer science and cybersecurity integration plan to ensure introduction to foundational computer science and cybersecurity knowledge. These integration plans are approved by each local school board to ensure that each district has the flexibility to develop a plan that fits into their unique situations. Plans would have to be developed and approved by local school boards no later than July 1, 2024.

Section 3 of the bill relates to high school graduation requirements and competencies. This section allows local school districts to determine if a stand-alone computer science or cybersecurity course can be counted as one of the three science units currently required for graduation. The 2019 legislative assembly already approved the opportunity to allow local school districts to decide if a computer science or cybersecurity course could be counted as one of the three units of math required for graduation. This section now adds science for local school district decisions.

Section 3 also requires students graduating from high school in 2026 or later to complete one unit of computer science or cybersecurity or have their school principal certify that they have graduated from a high school that has implemented the school board approved computer science and cybersecurity integration plan.

If the student chose to take a stand-alone course for one-unit it could be used to meet either the math or science requirement – if the district allows. Including this language ensures the State is not increasing the requirements needed to graduate from high school, or taking away the opportunity to take other elective courses the student is interested in, but it also ensures that students will have the competency needed in the areas of computer science and cybersecurity when they graduate from high school.

In addition, I would like to propose an amendment on page 7, after line 4, to create a new subsection 2. This amendment includes language for intent originally approved by the task force but inadvertently omitted during the drafting of this bill. This amended subsection would state that students are exempt from the requirement of taking a stand-alone computer science or cybersecurity course if the student participates in the computer science or cybersecurity integration plan approved by their school board. What this means is that computer science and cybersecurity standards are embedded in instruction in other classes.

This doesn't add any requirements by the state, but it allows the school district the flexibility of local control to set higher requirements for math and science courses, if they want to. For example, some districts require swimming as a physical education class for their local graduation requirements, even though it is not required by the state.

Section 4 of the bill offers opportunities for adult learning courses in computer operations and cybersecurity. The superintendent of public instruction is given the authority to provide grants to school districts, nonpublic schools, area career and technology centers, Job Service North Dakota workforce centers, public libraries, and adult education centers. These grants come from money already available through the North Dakota Department of Public Instruction, so no appropriation is necessary. These grants would be available for the 2023-2025 biennium. You'll



see on page 7, lines 19-20, that the superintendent of public instruction would be required to write rules to implement the program.

I would like to introduce an amendment that would strikethrough the words “adopt rules” and replace that with “create guidance”. Creating guidance instead of rules would allow the grant program to begin immediately on July 1 and not have to wait for the rules process to be completed and allow the use of the federal funds I mentioned.

Section 5 of the bill simply states that the adult learning grants would no longer be available beyond the 2023-2025 biennium.

I’ll talk next about the training opportunities and credentials that are already available.

In 2019 North Dakota adopted Computer Science & Cybersecurity Content Standards for each grade level kindergarten through 12<sup>th</sup> grade. During the 2019 Legislative Session, NDDPI was given the authority to write rules and create computer science and cybersecurity credentials. These credentials allow teachers to participate in training opportunities and then be qualified to teach courses or implement content related to computer science and cybersecurity. So far, approximately 400 teachers in the state have completed the training required to qualify for a computer science and cybersecurity credential.

Finally, I will talk a little bit about where North Dakota students are regarding computer science and cybersecurity.

North Dakota is already falling behind other states and other countries who have taken seriously the need to have students cyber educated. 27 States require all high schools offer CS classes, but North Dakota does not. 12 states require access for all k-12 students, but ND does not. 33 states have dedicated funding for computer science and cybersecurity instruction in schools, but North Dakota does not. In early 2022, the European Commission’s Joint Research Centre (JRC) released *Reviewing Computational Thinking In Compulsory Education*. Of the 29 European countries included in the study, 25 countries have basic computer science concepts in their mandatory curriculum, with 17 countries making it mandatory in both primary and lower secondary schools.

Even though DPI has been providing no-cost training, resources and support to incentivize our schools for several years only 76 high schools in North Dakota (about 44%) offer a foundational computer science course. This is well below the national average. The schools offering computer science are the larger school districts, putting our rural students at a significant disadvantage. (Ref - [Computer Science Access Report Data | Code.org](#)).

In ND, 32.9% of unemployed individuals lack foundational digital skills, meaning that they can’t compete for 72.7% of the open jobs in the state. Although all our most in-demand jobs require at least a basic digital skillset, there are currently 1,389 open computing jobs in the state of North Dakota. (Ref - [Promote Computer Science | Code.org](#) and [Digital Equity Scorecard \(digitalinclusion.org\)](#)).

The 21<sup>st</sup> Century workforce needs 21<sup>st</sup> century skills. To ensure North Dakota remains competitive in national and international markets, we need every adult worker, jobseeker, and student graduating with at least basic knowledge of computers and how modern systems communicate, even if they are not going to specialize in a cyber career. We can't expect students to start at the high school level; we need computer science and cybersecurity courses at elementary and middle school levels as well. For example, math skills are important, so we don't start teaching math at high school levels, we begin education in math concepts in elementary and middle school.

In addition to the 27 states that require high school courses, and the 12 states that require it in all grades, currently five states require computer science for graduation, and that number is growing. State legislatures across the U.S. are enacting laws to make this a requirement.

For those who wonder how this aligns to the established mission of the PK12 Strategic Vision of North Dakota Education, the answer is simple: We cannot ensure that "All students will graduate Choice Ready, with the knowledge, skills, and disposition to be successful" without it.

North Dakota cannot afford to let another year pass without ensuring our student remain competitive.

Testimony on House Bill 1398

House Education Committee – February 14, 2023

By Zoe Bundy, Senior at Davies High School

Mr. Chairman and Members of the Education Committee,

My name is Zoe Bundy. I am a senior at Davies High School and I recently served as the student stakeholder on the North Dakota Computer Science and Cybersecurity Task Force. Today I am here to share three reasons why you should vote in favor of House Bill 1398.

The first reason you should vote to pass HB 1398 is this bill will help prepare the next generation to better stand up to common and very expensive data breaches. From the workforce perspective, this makes sense. Last year I worked in sales at a local business services company, and part of our employee training was mandatory cybersecurity lessons. Each quarter we completed video lessons and quizzes to stay up to date on the latest scams and become equipped to handle any threats to our company. It was during this training that we were told almost all of the data leaks experienced by large companies are due to employee error. In a 2022 Data Breaches Investigation Report by Verizon, it was reported that 82% of data breaches involved a human element. By educating our future workforce, we can start preventing large breaches in company data; saving companies a lot of money and defending against illegal activity.

The second reason you should vote to pass HB 1398 is the alignment with the North Dakota R U Read graduation requirements. As students prepare to graduate, they complete mandatory courses – like economics and government, to prepare for a job, trade, college, or military path post-graduation. There is no better way to prepare students for the technology-focused workforce of today and tomorrow than teaching them about cybersecurity and computer science.

The third reason you should vote to pass HB1398 is that it can help students remain safe on the Internet. As a student who uses the Internet regularly for school and work, I want to be informed on the best practices for how to stay safe online. According to a 2022 study from Common Sense Media, American teenagers spend an average of nine hours a day with digital technology. Nine hours! Nine hours of opportunity for hackers to cause issues by sending phishing emails, or scam messages intended to harm others. Unfortunately, over this past school year one of my friends was deceived and her information was compromised. Innocently, she was looking for a relationship over social media, seeking connection, when she found a guy who seemed safe. He asked for her passwords and she gave them to him. He then proceeded to message her family and other social media followers posing as her. Cases like this are common and students should be regularly equipped with the knowledge to keep themselves safe on the Internet.

House Bill 1398 would rewrite the narrative for students using technology. With an increased awareness of the risks associated with online communication, insight into the best practices of staying safe on the web, and more, students will be better equipped for the workforce, build their cyber awareness within the R U Ready Initiative, and remain vigilant while using technology.

Mr. Chairman and Members of the Committee this concludes my prepared testimony, and I will stand for any questions that you may have.



1 HB 1398

2 Testimony in support

3 Good afternoon, Chairman Heinert and members of the House Education Committee. I am  
4 here representing the North Dakota Council of Educational Leaders representing your school  
5 leaders across North Dakota.

6 We are here to support HB 1398 with the amendment removing one unit of computer science  
7 or cybersecurity needed for graduation and adding language to the completion of a computer  
8 science and cybersecurity integration plan that is approved by the district's school board.  
9 School districts also can chose to offer a standalone unit of computer science or  
10 cybersecurity. With the increased use of technology in education, we feel it is important for  
11 local districts to determine the computer science and cybersecurity knowledge for their  
12 students.

13 We would appreciate that you take this into account as you consider this bill.



**Senate Education  
HB1398**

**March 15, 2023**

Chairman Elkin and members of the Senate Education Committee, for the record my name is Wayde Sick, State Director for the Department of Career and Technical Education. I am submitting testimony in support for HB1398.

The State Board for Career and Technical Education has discussed this topic at length and on January 23<sup>rd</sup>, the Board voted unanimously to provide its support of HB1398.

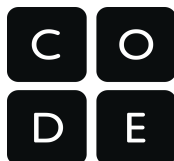
As stated, the State Superintendent was tasked to collaborate with stakeholders to determine how to best integrate computer science and cybersecurity into elementary, middle, and high school curriculum. By requiring schools to include this instruction, the state is addressing a few very important issues. First, by providing students instruction throughout their K12 education and starting early, we are able to help students stay safe while online. Instruction could include what to trust while online and how to identify and avoid potential attacks. Secondly, as technology continues to influence more of our lives, all workers will need to have a certain level of digital literacy to be able to perform their work responsibilities. From healthcare to construction to teaching, digital literacy is



necessary. These skills are not just for those individuals that are pursuing a career in Computer Science, Cybersecurity, or Information Technology. You may have witnessed this yourself in February in Memorial Hall, where several CTE programs from across the state were here to share their programs and the necessary technology. Finally, providing digital literacy education at an early age can get students on a career path in Information Technology. As of today, there are 693 vacant computer jobs listed on Job Service North Dakota's website, including telecommunications, technology coordinators and engineers. We know this is not an all-inclusive list as not all positions are posted and many times, multiple open positions are listed in one job posting. Students don't know what they don't know, and by providing them exposure to these skills, we may open their eyes and spark an interest in these in demand, high skill, and high wage occupations. This awareness may drive more students to enroll in Information Technology programs while in high school and ultimately pursue post-secondary opportunities that lead to careers in technology.

To close, the North Dakota State Board for Career and Technical is supportive of HB1398 and encourages a do pass recommendation.

This concludes my testimony; I will stand for any questions you may have.



March 13, 2023

**Re: HB 1398; Support**

Dear Members of the Education Committee,

Code.org is a nonprofit organization dedicated to expanding access to computer science courses for all students. **Code.org fully and emphatically supports HB 1398.**

The components of this bill are essential to ensure that all students have a foundational understanding of computer science necessary for our modern world. Computing is a foundational skill for K–12 students. It develops students' computational and critical thinking skills and teaches them how to create—not just use—new technologies. In addition to the more than 1,500 currently open computing jobs in North Dakota, computing skills are increasingly valued in every sector, including agriculture, design, and manufacturing jobs. These open jobs will continue to grow, and without the necessary skills to fill them, our students will get left behind. Today, just 44% of high schools in North Dakota teach computer science and only 15 schools offered an AP Computer Science course in 2019–2020.

But this goes far beyond just preparing students for jobs. While not every student will become a computer scientist or even pursue a STEM career, all will benefit from learning fundamental CS concepts and practices. Multiple studies show that students learning computer science in primary school perform better in reading, math, and science. Computer science education promises to significantly enhance student preparedness for the future of work and active citizenship.

I ask for your full support of HB 1398. Thank you for your efforts in providing students in North Dakota with the foundational computer science instruction that they need.

Sincerely,

Sean Roberts  
Vice President of Government Affairs, Code.org  
[www.code.org](http://www.code.org)





1 HB 1398

2 Testimony in support

3 Good morning, Chairman Elkin and members of the Senate Education Committee. I am here  
4 representing the North Dakota Council of Educational Leaders representing your school  
5 leaders across North Dakota.

6 We are here to support HB 1398 with the house amendment removing one unit of computer  
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9 board. School districts also can choose to offer a standalone unit of computer science or  
10 cybersecurity. With the increased use of technology in education, we feel it is important for  
11 local districts to determine the computer science and cybersecurity knowledge for their  
12 students.

13 We would appreciate that you take this into account as you consider this bill.

Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052-6399

Tel 425 882 8080  
Fax 425 706 7329  
www.microsoft.com



March 15, 2023

Re: HB 1398; Support

Chairman Elkin and members of the Education Committee,

My name is Taya Spelhaug and I am the Manager of the TechSpark program for Microsoft in North Dakota and we fully support HB 1398.

In a world where virtually every industry is being impacted by technology, computer science and cybersecurity are as foundational as reading, writing, and math. Ensuring that every child in North Dakota has access to quality computer science and cybersecurity education is crucial to our workforce development efforts, helping grow our economy and set students up for success regardless of what career path they pursue. Computer science skills are applicable far beyond the technology industry –we aren't only thinking about hiring future Microsoft employees. Nearly every occupation in our modern economy utilizing fundamental computing skills. These are base skills required for countless jobs in the energy sector, health care, agriculture, and aviation to name a few.

Furthermore, parents throughout North Dakota are demanding access to quality courses and programs in this area. Nationally, 93% of parents want their child's school to teach computer science, but fewer than half of schools offer these courses. A lack of access hurts our economy and creates major inequities in education, particularly for rural communities and groups that have been traditionally underrepresented in computer science and other STEM fields.

In addition to being a common-sense investment in our future workforce, education in both computer science and cybersecurity help protect our kids as they enter the digital realm. They not only need to be proficient with these new tools, they also need to learn how to protect their personal and financial information. We have all seen the increase in attempts from lone individuals, state-sponsored actors, and others to steal data from companies, governments, and individual citizens – this is also a public safety priority.

We in the technology-sector stand strongly behind you as you work to tackle these challenges. Microsoft has been a strong advocate for expanding access to computer science and cybersecurity education in North Dakota and across the nation. These efforts have included initiatives such as Technology Education and Literacy in Schools or TEALS. Because there is a critical shortage of computer science teachers, TEALS pairs trained computer science professionals with classroom teachers to team-teach computer science. In North Dakota we have had over 15 schools teaching computer science through the TEALS program.

It's because of this that we respectfully ask the committee to give HB 1398 a DO PASS recommendation to help secure the future of North Dakota's youth in this digital age. Thank you for your time, your consideration and your service to North Dakota.

Thank you,

Taya Spelhaug  
TechSpark Manager ND  
Taya.Spelhaug@microsoft.com

**Senate Education Committee**  
**HB1398**  
**March 15, 2023**

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Chairman Elkin and members of the Senate Education Committee, my name is Patrick Bertagnolli, and I am the Executive Director for Job Service North Dakota. I am here today in support of HB1398.

I have been a member of the Workforce Development Council (The Council) since 2014 and continue to serve on this committee in my current capacity as Executive Director of Job Service North Dakota. Through the work on The Council, we have supported the need for digital literacy for all citizens of North Dakota. Additionally, as a member of the State Board for Career and Technical Education, I have also been involved in discussions related to this topic and voted to support HB1398.

Job Service North Dakota Workforce Centers often see job seekers and Unemployment Insurance claimants with barriers to employment, including lack of basic computer knowledge and skills. They often don't understand the basic computer hardware, such as a mouse or keyboard. Additionally, navigating a website, using email, or filling out job applications is often foreign to some of these customers.

Twenty-First Century skills are necessary for students and future job seekers to be prepared for the workforce. Computer Science and specifically Cybersecurity instruction impact all industries in North Dakota from Ag to Energy. Regardless of the industry or career choice, there are typically job requirements for some form of technology knowledge and skill. It is critical for students to be equipped with these skills to navigate in today's workforce. The earlier we can reach students and the more we can continue to educate them on their learning journey as it relates to Computer Science and Cybersecurity instruction, will only improve their employability upon graduation.

Testimony on HB 1398  
Senate Education Committee  
3.15.2023

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Chair Elkin and members of the Senate Education Committee,

Governor Burgum and his administration stand in support of House Bill 1398, which prioritizes cybersecurity and computer science in our K-12 classrooms.

This administration has placed a strong emphasis on the critical importance of computer science and cybersecurity. Through the establishment of the PK-20W Initiative (<https://www.ndit.nd.gov/pk-20w-initiative-computer-science-and-cyber-education>), the vision of “Every Student, Every School, Cyber Educated” ensures our students have the skills and knowledge to navigate a technology-driven economy.

While this concept has undergone many iterations, the current language provides local control while ensuring our students have the choice to access a course within this critical content area. In the past two years, students have been provided computers or other technology devices to engage in learning and education. With increased access, it is critical our students learn how to navigate technology and the online world by learning foundational skills around cyber safety, such as password phrases, safe websites and verified sources just to name a few.

Computer science and cyber education also provides another avenue for students to problem-solve, analyze data and use algorithmic thinking as well as other 21<sup>st</sup> century skills. When students experience learning through real-world application, it fuels curiosity and motivates the learner to become engaged.

Not only is the learning environment demanding that students have experiences around cybersecurity and computer science, but the prevalence of technology in our daily lives has become a direct factor in employability. Employers are increasingly seeking students prepared with the skillsets to navigate tech challenges and cyberattacks and complete daily tasks using technology devices.

As the first state with cybersecurity and computer science standards, North Dakota has the unique opportunity to continue to lead and ensure our students have every chance to rise to the top. With our collective support of HB 1398, we can fulfill the vision of Every Student, Every School, Cyber Educated.

Maria Neset  
Senior Policy Advisor  
Office of the Governor

## Additional Information

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### The Skills Gap is Growing:

- Predicted worldwide shortage of 3.5 million cybersecurity positions through 2025 ([Cybersecurity Ventures](#)); currently 715,348 cybersecurity openings nationwide ([Cyberseek](#)).
- Cybersecurity has a **virtually 0% unemployment rate**.
- A [2019 Presidential Executive Order](#) calls for increased focus on enhancing the United States' cybersecurity workforce as a strategic asset to protect national security.
- North Dakota's military footprint and national leadership in energy, agriculture and unmanned aircraft systems (UAS) are key economic drivers.
- Implementing and securing 21<sup>st</sup> century technology infrastructure will enable continued growth across public and private sectors, helping attract capital and talent to the state.

### Threats:

- Ransomware attacks are in the headlines daily with thousands of entities falling prey every year. School districts and government entities are prime targets for attacks.
- In the U.S., the average cost of a data breach is \$4.24 million (IBM and Ponemon report, August 2021, [What is the Cost of a Data Breach in 2021? | UpGuard](#). There is a hack every 39 seconds. - [Digital Guardian Blog](#)
- The global pandemic has increased cyberthreats due to the work-from-home shift.

### Computer Science:

As a broader field directly tied to dozens of technology-centric careers including cybersecurity, in the Computer Science realm:

- 90% of parents want computer science to be taught; only 51% of schools teach it. ([Code.org](#)).
- There are more than 695,077 computing jobs open nationwide, yet there were only 79,991 computer science graduates entering the workforce last year. ([Code.org](#)).

### In North Dakota:

- There are approximately 1,171 open cybersecurity jobs ([Cyberseek](#)) and 1,389 open computing jobs ([ND.pdf \(code.org\)](#)); however, recent data shows North Dakota had only 177 computer science graduates in the state. And the actual number of open computing jobs is likely significantly higher.
- According to [Code.org](#), the average salary for a computing occupation in North Dakota is \$73,102, which is significantly higher than the average salary in the state (\$48,130). Existing openings in cybersecurity and computing jobs combined represent a \$168 million opportunity in terms of annual salaries.

March 15, 2023

To: N.D. Senate Education Committee  
 From: Zac Smith, communications and government relations director, NDAREC  
 RE: **Support of HB 1398**

Chairman Elkin, and members of the House Education Committee, my name is Zac Smith, and I'm the communications and government relations director of the North Dakota Association of Rural Electric Cooperatives, or (NDAREC). We represent sixteen electric distribution cooperatives and five generation and transmission cooperatives that generate, transmit and distribute electricity and maintain more than 64,000 miles of powerlines across the state of North Dakota.

The North Dakota Association of Rural Electric Cooperatives supports K-12 educational programs focused on computer science and cybersecurity. In today's highly interconnected world, it's imperative that technology is available, and data and systems are protected and secure. To accomplish this, industry and government must partner to enhance, grow and inspire those who will comprise our future workforce and encourage careers in the fields of computer science and cybersecurity.

The electric industry has complex information technology systems that improve service reliability, resilience and efficiency; therefore, electric utilities must continuously work to secure electric systems and data. The last few years have demonstrated that many jobs are reliant on technology.

It can be difficult to recruit and/or find local qualified professionals required to manage the protection of computer systems. Providing opportunities for all students to engage in computer science and cybersecurity programs is crucial to growing the local workforce of tomorrow. Therefore, we urge a DO PASS recommendation on HB 1398 and thank you for opportunity to submit testimony.

Chairman Elkin and members of the Senate Education Committee, for the record my name is Byron Snider, I am the VP of Technology for Scheels All Sports, Inc. I am submitting testimony in support of HB1398.

We know that computers and technology are the future tools of the workforce in North Dakota. Currently the North Dakota required education standards do not make accommodations for these skill sets. Given the clear future of workforce skill set needs it would be a prudent step to include computer education into the Century code for education requirements.

HB1398 does a good job in providing a standard and yet allows flexibility by allowing one unit of computer science or cybersecurity. Computer Science is a foundational piece of the workforce in the future. Potentially more important than Geography, Government or Science.

The sooner we introduce core computer education into the curriculum the better we will be for the future. We have seen a direct correlation between students that learn Music or a foreign language to those that are good Software Developers. We would expect even better results for the future workforce when cybersecurity and computer science is introduced sooner in the education journey of North Dakota students.

Finally I want to touch on the grant portion of HB1398. Cybersecurity for adult learning is critical to ensuring we are doing good due diligence with today's urgent needs. You do not need to read the national news very long to find a computer breach or Cybersecurity issue. Providing grant dollars to try and meet the short term immediate needs for career centers and workforce centers is a smart prudent use of funds.

We would urge a do pass recommendation on HB 1398

Byron Snider  
SIS Leader - Scheels

TESTIMONY OF  
MAJOR JAY SHELDON  
NORTH DAKOTA NATIONAL GUARD  
BEFORE THE  
SENATE EDUCATION COMMITTEE  
15 MARCH 2023  
HOUSE BILL 1398

Chairman Elkin and members of the committee, I am Jay Sheldon, Strategy and Policy Officer for the North Dakota National Guard (NDNG). I am here today to provide testimony in support of HB 1398.

In today's rapidly advancing technology landscape, computer science skills are in high demand across all industries, including the military. A strong understanding of computer science can open a wide range of career opportunities for students after graduation. An opportunity that we would like them to consider is the military, specifically the North Dakota Army and Air National Guard.

The National Guard would benefit from a computer education requirement in two ways. First, the NDNG has 31 (6 full-time and 25 part-time) open computer science related positions we are constantly trying to fill and second, the technology used in today's military requires many of our soldiers and airmen to be proficient in various computer science related tasks.

The North Dakota Army and Air National Guard employs 83 full-time and 291 part-time employees in information technology/computer science positions. As the military continues to grow its cyber security force there is a need to produce more individuals with these capabilities.

All military missions rely heavily on technology and computer systems for communication and navigation is critical for the military's long-term success. Unfortunately, current data of individuals that take the ASVAB, the standardized test used to assist the military with career placement, technology is area where local test takers have had lower performance, at least partially evident by our open positions.

A great way to grow the pool of people capable to fill the growing need is to expose them to computer science throughout their primary educational experience. To fill our positions and those across all industries we support HB 1398.

Thank you and I will stand for questions.



**HB1398**

Senate Education

March 15, 2023

Mark Hagerott, Chancellor, NDUS  
701.328.2963 | [mark.hagerott@ndus.edu](mailto:mark.hagerott@ndus.edu)

Chair Elkin and Committee Members: My name is Mark Hagerott, and I am the Chancellor of the North Dakota University System. I'd like to provide this written testimony in support of House Bill 1398, as the NDUS and its institutions have interest in digital literacy to be extended through public education.

As this committee and the greater legislature certainly understands, cyber security is becoming an increasingly common concern. Numerous workforce and higher education studies have shown the growing need for technical skills related to computer science and cyber security in more and more positions, as both have become instrumental for a majority of jobs throughout business and industry.

The university system supports this bill, which would provide training to our K-12 system and create opportunities for our elementary and secondary students to equip themselves with the digital skillsets that will be demanded of them upon graduation and entry into the workforce. This proposal complements the State Board of Higher Education's expectation of a digital literacy component as a general education requirement of NDUS graduates.

The university system's Dakota Digital Academy initiative has already found success in offering digital content such as this to our state's post-secondary institutions. I believe such a mechanism could be useful for the development and delivery of related digital content in the future at both the K-12 and postsecondary levels.

This concludes my testimony for HB1398, and I will stand for questions from the committee.

Thank you.

## Testimony on House Bill 1398

Senate Education Committee – March 15, 2023

By Zoe Bundy, Senior at Davies High School

Mr. Chairman and Members of the Education Committee,

My name is Zoe Bundy. I am a senior at Davies High School and I recently served as the student stakeholder on the North Dakota Computer Science and Cybersecurity Task Force. Today I am here to share three reasons why you should vote in favor of House Bill 1398.

The first reason you should vote to pass HB 1398 is this bill will help prepare the next generation to better stand up to common and very expensive data breaches. From the workforce perspective, this makes sense. Last year I worked in sales at a local business services company, and part of our employee training was mandatory cybersecurity lessons. Each quarter we completed video lessons and quizzes to stay up to date on the latest scams and become equipped to handle any threats to our company. It was during this training that we were told almost all of the data leaks experienced by large companies are due to employee error. In a 2022 Data Breaches Investigation Report by Verizon, it was reported that 82% of data breaches involved a human element. By educating our future workforce, we can start preventing large breaches in company data; saving companies a lot of money and defending against illegal activity.

The second reason you should vote to pass HB 1398 is the alignment with the North Dakota R U Read graduation requirements. As students prepare to graduate, they complete mandatory courses – like economics and government, to prepare for a job, trade, college, or military path post-graduation. There is no better way to prepare students for the technology-focused workforce of today and tomorrow than teaching them about cybersecurity and computer science.

The third reason you should vote to pass HB1398 is that it can help students remain safe on the Internet. As a student who uses the Internet regularly for school and work, I want to be informed on the best practices for how to stay safe online. According to a 2022 study from Common Sense Media, American teenagers spend an average of nine hours a day with digital technology. Nine hours! Nine hours of opportunity for hackers to cause issues by sending phishing emails, or scam messages intended to harm others. Unfortunately, over this past school year, one of my friends was deceived and her information was compromised. Innocently, she was looking for a relationship over social media, seeking connection, when she found a guy who seemed safe. He asked for her passwords and she gave them to him. He then proceeded to message her family and other social media followers posing as her. Cases like this are common and students should be regularly equipped with the knowledge to keep themselves safe on the Internet.

House Bill 1398 would rewrite the narrative for students using technology. With an increased awareness of the risks associated with online communication, insight into the best practices of staying safe on the web, and more, students will be better equipped for the workforce, build their cyber awareness within the R U Ready Initiative, and remain vigilant while using technology. Students need this to be successful.

**TESTIMONY ON HB 1398  
SENATE EDUCATION COMMITTEE**

**March 15, 2023**

**By: Gavin Kratcha, Student at Hankinson Public School  
701-899-2779**

Mr. Chairman and Members of the Committee:

My name is Gavin Kratcha. I am a Junior at Hankinson High School. I am here today to speak in favor of House Bill 1398 regarding Computer Science education.

With the pandemic, many of our students felt more isolated than ever. The pandemic left us with one of the most difficult times in Education in our nation's history. There is a lack of motivation. Students have less of a connection with our schools. Students feel more distanced from each other than they ever had. But with these hardships came a gift. This gift was the gift of technology. More people have access to technology and the internet at their fingertips than ever before. We used this gift in our schools to have lectures and assignments online, something that was new to all of us. Students use this technology every day, but they have never been taught how to use this technology to its fullest potential. Students and teachers dove into the world of technology so fast that, in many instances, they haven't been taught proper digital citizenship and cybersecurity.

This is a huge problem in our education system. Students must know how to use this technology properly to be able to use the technology to its fullest potential. This bill will help solve this problem. By requiring students to have one unit of computer science or cybersecurity, students will gain basic knowledge of how to use a computer properly with consideration to good cybersecurity. This will prepare them for their future lives, where technology will be used every day.

Technology also brings opportunities and programs to our students, who may not have these opportunities otherwise. I mentioned students' lack of engagement earlier. I believe that integrating computer science in all school districts could help this. I had the amazing opportunity to assist the technology coordinator in planning an Hour of Code program at our school. I worked closely with him to organize the event, and I had the chance to work with students of all ages to expose them to the great subject of computer science. I saw something quite profound that day. I saw students walk in with the same look we've all seen far too often. The look that shows a lack of engagement and motivation. The excitement just wasn't there. We started to show them all the different things there were to do. We showed them how to code a robot to make art. We made an obstacle course for a robot to navigate with the students' code. We had many different stations with all kinds of technology. We then got the students to try something, it didn't matter what the outcome was or how it worked, we just

wanted them to try. At the beginning, it was difficult to get the excitement, something we see a lot in education. But then the students started using the technology. We saw students that were deprived of excitement turn energetic. They had excitement, they had drive, they had motivation. They started to naturally work together and think creatively of how to solve the problem. It wasn't long before every student in that room was gleaming with excitement. With every new group, we heard the same thing from the teachers: they have never seen their students this excited, this engaged, and this motivated all year. By the end, they couldn't get their students to leave, they were too engaged and they wanted to try everything there. Every hour we saw the same process. Students entered, unmotivated and undriven. By the end, you couldn't get them away from the technology.

All it took was one hour. One hour of exposure to computer science for their mindset to flip. They were excited, driven, and happy. Now imagine if they had one hour of this every day for a year. Students would learn more about computers and computer science than ever before. There would be excitement and drive that we need so desperately. I believe that this bill has the potential to not only improve computer literacy and cybersecurity, but also give us more student engagement and a newfound source of opportunity for our students.

The purpose of our education is to prepare us for our future lives. Whether that is entering the job force, going to college, starting your own business, or

anything else, technology will be used in all aspects of our live. It would be an injustice to us, the students, to not teach us how to use this technology that we have at our disposal. We must teach students cybersecurity in order to stay safe in this increasingly digital world. We must also teach computer literacy so students know how to navigate this digital world. Teaching students basic computer science will give them a competitive edge and allow them to explore opportunities they previously didn't know existed. This is why I firmly believe that in order to say that we are preparing students for their future lives, we must educate all our students in computer science and cybersecurity.

This bill has the opportunity to give our students something amazing. This bill would give students the proper education in technology so that we can succeed in our future lives. This bill would help our students become more involved with school and give our students a way to engage with the technology we have. If we want us, the students, to be the most prepared and well-rounded students we can be, we must provide computer science education to every student.

Mr. Chairman and Members of the Committee, that concludes my prepared testimony. I will stand for any questions that you may have.



Testimony

## **Senate Education Committee**

HOUSE BILL NO. 1398

March 15, 2023

Chairman Elkin and members of the Senate Education Committee. The Valley Prosperity Partnership (VPP) is a membership organization led by business executives – joined by economic development, chamber of commerce, and higher education leaders – to advance and advocate for shared strategic economic development opportunities for the Red River Valley region and for North Dakota.

The Valley Prosperity Partnership strongly supports HB1398, which would require the integration of cybersecurity into K-12 classwork (not as a stand-alone course) and mandate a computer science class as a graduation requirement (after 2025).

Having basic computer literacy skills can help children develop advanced skills and create pathways to higher wage occupations. Employers in all sectors of the economy want their workers to have basic computer skills as their organizations become ever more dependent on computers.

Communication today is mostly digital. Staying safe online is one of the most important things that young people can learn about technology. The internet is a part of modern life that contains a lot of hidden dangers, and an adult can't always be there to keep an eye on their activities. The widespread adoption of e-learning in education and the proliferation of social media has increased cyberattacks; cybercriminals are finding more opportunities to defraud people and steal sensitive information.

Educating students in the basics of cybersecurity – many who cannot imagine life without a smartphone – not only protects their identity, but it literally could save their life. Teaching students about cybersecurity from a young age protects not only them, but also our communities, schools, companies, and countries from digital threats and attacks.

The VPP strongly supports HB1398's intention to increase understanding of cybersecurity at all grade levels and the need for a required computer science class prior to graduation.

## Valley Prosperity Partnership Steering Committee

Brian Johnson, CEO, Choice Bank,  
Co-Chair Valley Prosperity Partnership\*

Judd Graham, Market President  
Dacotah Bank - Fargo  
Co-Chair Valley Prosperity  
Partnership\*

Jonathan Holth, JLG Architects  
Vice Co-Chair\*

Marshal Albright, President & CEO  
Cass County Electric Cooperative,

Andrew Armacost, President  
University of North Dakota

Steve Burian, President & CEO  
Burian & Associates

Dan Conrad, President & CEO  
Blue Cross Blue Shield North Dakota

David Cook, President  
North Dakota State University

Tim Curoe, CEO  
RD Offutt Company

Mylo Einarson, President & CEO  
Nodak Electric Cooperative

Chad Flanagan, Partner  
Eide Bailly

Rod Flanigan, President  
North Dakota State College of Science

Todd Forkel, CEO  
Altru Health System

Shannon Full, President/CEO  
Fargo Moorhead West Fargo  
Chamber of Commerce\*

Shawn Gaddie, Director of Infrastructure  
Management Services, AE2S  
AE2S

Jim Galloway, Principal  
JLG Architects

Kevin Hanson, President & CEO  
Gate City Bank

Tiffany Lawrence, CEO & President  
Sanford Fargo

Keith Lund, President & CEO  
Grand Forks Region EDC\*

William C. Marcil, Sr. Chairman  
Forum Communications Company

Pat McAdaragh, President & CEO  
Midco

Jeff Melgaard, Vice President  
Construction Engineers

Tammy Peterson, Grand Forks Region  
President & Ag Banking Director  
Bremer Bank

Joe Raso, President & CEO  
Greater Fargo Moorhead EDC\*

Jim Roers, President & CEO  
Roers Construction & Development

Richard Solberg, Chairman & CEO  
Bell State Bank & Trust

David White, President  
Border States Electric

Barry Wilfahrt, President & CEO  
The Chamber Grand Forks/East Grand  
Forks\*

Chris Wolf, North Valley Market President  
Alerus Financial

Delore Zimmerman, Executive Director\*

\* Member Executive Committee





March 15, 2023

Re: Computer Science as a High School Graduation Requirement

Hello, Chairman Elkin and members of the Senate Education Committee:

My name is Jordan Zakery, and I serve as Regional Advocacy Director at ExcelinEd, a national nonpartisan education policy solutions tank founded by Governor Jeb Bush. Thank you for the opportunity to submit testimony regarding the benefits and current landscape of K-12 computer science as a course offering and/or graduation requirement in states across the nation.

Nationwide, five states are currently leading the charge in requiring computer science as a high school graduation requirement: South Carolina, Nevada, Arkansas, Nebraska and Tennessee. Altogether, 27 states have adopted policies that ensure high school students have access to computer science courses.

North Dakota currently allows two computer science courses—AP Computer Science A or Mathematics for Computer Science/Information Technology—to count as a mathematics credit toward graduation. The legislation you are now considering would make computer science a graduation requirement by allowing students to receive credit in mathematics or science, or both, by completing approved computer science courses.

To be prepared for success in the 21<sup>st</sup> century workplace and a technology economy, today's students need access to coursework that builds relevant, in-demand skills and credentials. Such skills can also lead to higher-quality, higher-wage jobs. According to the Brookings Institution's [Hamilton Project](#), a college graduate with a computer science major can earn 40 percent more than the college average. Currently, computing occupations are the number one source of new wages in America—that's 16 percent of all new wages.

In North Dakota alone, the **Technology Council of North Dakota** has identified more than 4,100 businesses within the tech subsectors that employ more than 21,000 North Dakotans in various fields. Over the last ten years, the contribution of the



technology subsectors to North Dakota's GDP almost doubled, growing by 39 percent.

Support among educators and parents for computer science access is also high. [Gallup](#) reports that 90 percent of parents want their children to learn computer science, while only 53 percent of schools nationwide offer computer science. According to [data from code.org](#), 83 percent of parents and 64 percent of students in rural and small towns believe offering computer science is more or equally important as any required course.

Establishing policy that requires computer science as a graduation requirement is a visionary investment. It benefits not only today's students but also grows a state's workforce and economy and helps build the state's long-term success. Thank you for graciously allowing us to contribute testimony.

Respectfully,  
Jordan Zakery

TESTIMONY OF  
DARIN HANSON  
NORTH DAKOTA DEPARTMENT OF EMERGENCY SERVICES  
HOMELAND SECURITY DIVISION  
BEFORE THE  
SENATE EDUCATION COMMITTEE  
15 MARCH 2023  
HOUSE BILL 1398

Chairman Elkin and members of the committee, I am Darin Hanson, Homeland Security Division Director at the North Dakota North Dakota Department of Emergency Services (NDDDES) and I am here today in support of HB 1398. Plainly and clearly, cybersecurity is homeland security.

As cyber criminals conduct non-stop attacks against our citizens and critical infrastructure, nation states stand poised to probe and attack the same targets in modern grey zone warfare. Like our ongoing efforts to build a society prepared for natural disasters and other emergencies, we need a populace who knows how to avoid being involved in a cybersecurity incident. The most effective way we can do this is by ensuring that proper cyber hygiene is followed by all our citizens. We are only as strong as our weakest link.

Meanwhile, cyber-attacks continue to increase, impacting the critical infrastructure our citizens rely on. As the state agency responsible for coordinating response and recovery to cyber emergencies external to the state's own network, it is imperative that we first focus our efforts on avoiding cyber incidents in the first place. Make no mistake, we will pay the price for cyber attacks one way or another. It can be on the front end through investing in our citizens and future workforce through cyber education, or we can pay for it in response and recovery costs.

As we move forward in this new future where cyber threats and attacks become a larger part of the NDDDES mission, it is important to recognize that we will need both a cyber ready workforce within the agency and also a cadre of cyber experts ready to assist in the response to cyber-attacks. NDDDES has just begun to establish a voluntary Cyber Incident Support Team and is working with the ND Department of Information Technology and other stakeholders to move this much needed capability forward. This bill will both support efforts to prevent an incident response and increase the pool of cyber professionals we can call on to support missions across the state.

HB1398 furthers the advancement of existing efforts at the NDDDES such as support for CyberCon, Cyber Madness, the State & Local Cybersecurity Grant Program, and portions of State Homeland Security Grant funds that are set aside for advancing cybersecurity across North Dakota. Let's continue to show the country and world that North Dakota is the most cyber ready state by voting Do Pass on HB1398.

Mr. Chairman, that completes my testimony, and I will stand by for any questions that you may have. Thank you for your time and the opportunity to speak today.



Senate Education Committee – HB1398

March 15<sup>th</sup>, 2023

Chairman Elkin and members of the Senate Education Committee, my name is Greg Hoffman, and I am the Deputy CIO for North Dakota Information Technology. I am here today in support of HB1398.

Technology is transforming virtually every job, every sector, every industry. As this transformation drives demand for a highly skilled workforce, North Dakota's goal is to organically grow the next generation of computer science and cybersecurity professionals, while simultaneously growing our economy and helping set students up for success with 21st-century skills.

In January 2018, North Dakota kicked off the PK-20W Initiative with the goal of "Every Student. Every School. Cyber Educated." This robust ecosystem includes leaders from PK-12, higher education, state agencies, business and industry, workforce development, military and local and national strategic partners. Also in 2018, North Dakota became the "First Certified State Training Partner in the Nation" for Cyber.org which is funded by Homeland Security and whose curriculum is used for teacher training.

NDIT's EduTech division currently offers 7 online computer science and cybersecurity courses for teachers to go at their own pace utilizing the curriculum from Cyber.org. To date, EduTech has trained 261 educators that have received their credentials in computer science and cybersecurity. By Fall of 2023 we are on target to virtualize the Center for Distance Education Cybersecurity content, still partnering with CYBER.org for a High School course, which will help ND schools be able to offer computer science and cybersecurity content without qualified high school teachers. This brings the content to the students and allows teachers time to obtain their certification. EduTech utilizes content not only from Cyber.org, but also Microsoft Minecraft and Code.org, all of which aligns with computer

science and cybersecurity state standards as well as national standards. Most recently, EduTech has partnered with Cisco Networking Academy for their skills-to-job program called Skills for All. As of July 2022, North Dakota is the first state in the nation to provide these courses statewide at no cost to all residents.

In the 21st century, nearly every job in every industry is a computer job. Computer science and cybersecurity are foundational skills that can empower students, teachers and parents to protect themselves online in an increasingly digital world, learn valuable problem-solving skills and prepare for many career opportunities.



# North Dakota Small Organized Schools

Mr. Michael Heilman  
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HB 1398– Testimony in Support  
Senate Education Committee  
Senator Elkin – Chairman  
March 14, 2023

Chairman Elkin and members of the Senate Education Committee, my name is Michael Heilman. I am the Executive Director of the North Dakota Small Organized Schools (NDSOS). I represent 150-member school districts of the North Dakota Small Organized Schools. NDSOS stands in support of HB 1398 with the addition of the proposed amendment allowing for the integration of this curriculum as approved by the local school board.

There is no question that the availability of computer science and specifically cybersecurity education is important. Our schools can be a critical link in ensuring that students are given exposure, awareness and a career pathway if they choose. What we struggle with, especially our small schools, is finding the staff and the time to add another requirement. We continue to add, but seldom do we remove a requirement. Yes, we make concessions by allowing substitutions, which personally I appreciate and am in favor of, as it allows students to personalize their education to meet their needs. My concern is that additional requirements make personalization more difficult and why I support that addition of the integration plan language to this bill.

NDSOS stands in favor of HB 1398 with the proposed amendment allowing for a locally approved integration plan.

Michael Heilman  
NDSOS Executive Director  
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701.527.4621

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### Board of Directors

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Mr. John Gruenberg, Supt. Powers Lake

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Dr. Steven Johnson, Supt. Lisbon

**The mission of NDSOS is to provide leadership for the small/rural schools in North Dakota and to support legislation favorable to their philosophy while opposing legislation that is harmful.**



### FMWF Chamber Letter of Support for HB 1398

March 15<sup>th</sup>, 2023

Chairman Elkin and members of the Senate Education Committee:

For the record, my name is Cale Dunwoody and I have the pleasure of serving as the Director of Public Policy for the Fargo Moorhead West Fargo (FMWF) Chamber of Commerce. The Chamber's mission is to be a catalyst for economic growth and prosperity for businesses, members, and the greater community. On behalf of our over 1,900 members, I write this letter in support of House Bill 1398.

As many industries across our state and nation evolve and incorporate technology, our education system must also continue to evolve and provide students with foundational computer science and cybersecurity skills. In order for our state to develop a robust conduit of skilled workers, we must adapt our learning models and curriculum. While many students may not pursue a career in Information Technology (IT), Computing, or Cybersecurity, these fundamental skills will be essential for careers in the 21<sup>st</sup> Century. By adjusting curriculums to require computer science classes, we ensure that every student across North Dakota receives an education that meets 21<sup>st</sup> Century industry demands.

On behalf of our members, we respectfully urge a DO PASS recommendation, and I would like to thank the committee for their time and consideration. I will now stand for any questions.

Respectfully,

Cale Dunwoody  
Director of Public Policy  
FMWF Chamber of Commerce  
[cdunwoody@fmwfcchamber.com](mailto:cdunwoody@fmwfcchamber.com)



## Testimony House Bill 1398 – Senate Education Committee

Senator Elkin, Chairman

March 15, 2023

Chair Elkin and members of the Senate Education Committee, for the record, my name is Dr. Alyssa Martin. I am the director of the North Dakota Center for Distance Education (CDE). CDE supports HB 1398, viewing this bill as an effort to help North Dakota students remain competitive with the five states that now require computer science to receive a high school diploma and the 27 states that require schools to offer computer science courses. I will briefly highlight CDE's perspective on what advantages this bill will bring to North Dakota students and spend the remainder of my testimony describing the steps CDE has taken and will continue to take to help support this legislation and the intent behind it.

CDE has offered computer science and cybersecurity courses at the high school level for over ten years. Still, our enrollments are low, with just 75 high school completions in 2021-22 and 68 enrollments and 29 completions so far this year. The numbers that we have seen at CDE reflect a national trend. According to the *2021 State of Computer Science Education* report produced by the Code.org Advocacy Coalition, 78% of high school students have access to a foundational computer science course. Still, only 5% of students enroll in these often optional, elective courses.<sup>1</sup> From our perspective at CDE, an organization that values giving North Dakota students educational access and every learning advantage possible, these trends are disheartening, especially once one is aware of the many benefits of computer science education. To summarize only a few:

- A 2019 meta-analysis study found that, when reviewing 440 other studies of K-12 students who learned computer programming, this exposure to this field substantially improved creativity, mathematical skills, metacognition, spatial skills, and reasoning skills.<sup>2</sup>
- A College Board study showed that students who took computer science significantly outperformed their peers on AP exams in calculus and statistics.<sup>3</sup>

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<sup>1</sup> Hendrickson, K., Gauthier, L., Glennon, M., Harrigan, A., Weissman, H., Fletcher, C., & Mak, J. (2021). *2021 state of computer science education: Accelerating action through advocacy*. Code.org.  
<https://www.nga.org/webinars/2021-state-of-computer-science-education-report/>

<sup>2</sup> Scherer, R., Siddiq, F., & Sánchez Viveros, B. (2019). The cognitive benefits of learning computer programming: A meta-analysis of transfer effects. *Journal of Educational Psychology*, 111(5), 764.

<sup>3</sup> Buckley, J. (2015). *Preliminary results of AP computer science analyses*. The College Board.  
<https://code.org/files/CollegeBoardPreliminaryCSMemo.pdf>



- A longitudinal study conducted in two of the largest school districts in the U.S. found that computer science students were more likely to enroll in college than their peers, even after controlling for variables such as socioeconomic status, GPA, race, and gender.<sup>4</sup>
- According to a letter signed by 800 major industry, education, and nonprofit leaders in July 2022, “The USA has over 700,000 open computing jobs but only 80,000 computer science graduates a year.” The letter also emphasizes, “Graduates no longer need to leave their state to pursue careers in tech. Even the smallest town can become a tech hub; the key is education”—an important consideration for a rural state like North Dakota, which has and continues to take extensive measures to retain our students after high school and college graduation.<sup>5</sup>

Knowing the value of computer science education, how can a state ensure that students participate? Clearly, participation in computer science courses increases exponentially when states require it as part of high school graduation requirements, which is why Code.org has recommended such a legislative change as part of its “Nine Policies to Make Computer Science Fundamental.” There are both direct and indirect benefits to such a requirement. According to Code.org, “after South Carolina implemented its graduation requirement for computer science, graduation rates increased as a whole and for every racial and ethnic group tracked by the state.”<sup>6</sup> In addition to recommending that a computer science graduation requirement be codified into law, Code.org recommends offering computer science across the K-12 curriculum, citing studies on how early exposure to this content erases students’ fears and stereotypes about participating in computer science courses and helps build a pipeline within the field.

Because of the myriad of positive outcomes associated with computer science education, CDE, like many other state virtual schools, has proactively been offering cybersecurity and computer science coursework, recognizing that for small schools especially, finding qualified teachers, developing curriculum, and finding time within the school schedule to provide these courses can pose a challenge. We do not believe, however, that a lack of local resources should be a reason for denying students the benefit of exposure to computer science education. Throughout its history, CDE has served as an educational support service to ND K-12 schools, especially rural schools, helping provide instruction delivered by a state-licensed teacher in core, elective, and CTE areas when a district needs to fill a gap caused by a teacher shortage, experiences curricular cuts due to low enrollments, or faces the inability to offer certain content due to size or budgeting constraints. Likewise, CDE aims to support K-12 schools with the new requirements in HB 1398 through the following steps.

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<sup>4</sup> Brown, E. A., & Brown, R. S. (2020). *The effect of advanced placement computer science course taking on college enrollment*. West Coast Analytics.

[http://www.westcoastanalytics.com/uploads/6/9/6/7/69675515/longitudinal\\_study\\_-\\_combined\\_report\\_final\\_3\\_10\\_20\\_\\_jgq\\_.pdf](http://www.westcoastanalytics.com/uploads/6/9/6/7/69675515/longitudinal_study_-_combined_report_final_3_10_20__jgq_.pdf)

<sup>5</sup> Roberts, S., Osorio-Glennon, M., Weissman, H., Fletcher, C., Dunton, S., Baskin, J., & Mak, J. (2022). *2022 State of computer science education: Understanding our national imperative*. Code.org.

<https://advocacy.code.org/stateofcs>

<sup>6</sup> Roberts, S., Osorio-Glennon, M., Weissman, H., Fletcher, C., Dunton, S., Baskin, J., & Mak, J. (2022). *2022 State of computer science education: Understanding our national imperative*. Code.org.

<https://advocacy.code.org/stateofcs>

- CDE already offers an elementary scratch coding course and is currently piloting additional elementary curricula to provide young learners with various options for learning the basics of cybersecurity and computer science.
- CDE offers a full year of coding at the middle school level and is working with curriculum vendors to identify additional opportunities to expand its offerings at this level.
- At the high school level, CDE offers two full years of coding courses and one year of cybersecurity coursework. It is actively engaged with Edutech and partners from North Dakota's postsecondary institutions and industry to further expand technology curricular pathways to secondary learners, with the aim of them acquiring post-secondary credit and potentially post-secondary credentials in the form of certificates.
- CDE has identified a plan to scale its current offerings to meet the demand for the courses covered by this bill. DPI will support these efforts by earmarking \$600,000 in federal Elementary and Secondary School Emergency Relief (ESSER) funds to help cover the cost of CDE scaling up its computer science and cybersecurity courses. CDE will expand its adjunct pool to ensure qualified, licensed teachers teach these courses. We have worked with ESPB to identify all current teachers within the state who are qualified to teach computer science and cybersecurity to prepare a distribution list, notifying them of CDE's efforts to hire teachers with computer science credentials. We have had great success in the past recruiting in-state teachers to work as adjuncts for CDE while they maintain their day jobs in local schools.

Because of the value of computer science education, the need to remain competitive with other states already requiring it, and the feasibility of local schools implementing this law with CDE as a partner, CDE recommends a do pass on HB 1398.

**TESTIMONY ON HB 1398**  
**SENATE EDUCATION COMMITTEE**  
**By: Marisa Riesinger, Elementary Library Media Specialist**  
**701-290-7732**  
**Dickinson Public Schools**

Mr. Chairman and Members of the Committee:

My name is Marisa Riesinger, and I am an elementary library media specialist for the Dickinson Public School district. I am here to speak in favor of House Bill 1398 regarding computer science and cybersecurity instruction for all students.

Most likely, we are all familiar with the growing statistics about the need for computer science related jobs. In fact, our students will be entering the workforce when computing jobs are the number one source of new wages (Code.org) with over 500,000 new jobs by 2028 (Bureau of Labor Statistics). North Dakota is no exception. In fact, ten-year career projections show an 18.1% increase for information technology jobs which is higher than all other career clusters in the state (ComputerScience.org, 2021). We must ask ourselves: How do we make sure North Dakota students are prepared to be successful? The answer: We must take collective responsibility to ensure North Dakota graduates are college and career ready whether they stay here or represent our state abroad, and this looks very different than it did even five years ago. Thus, guaranteed computer science and cybersecurity instruction must be in every school, in every grade level, and for every student.

Unfortunately, educators are already behind when children get to school. The National Center of Education Statistics reports nearly half of American three- and four-year-old children use the internet from their home – long before they use devices in school. Yet, most of their

caregivers lack the education and training to support their child’s digital awareness and safety. This prioritizes the schools’ need to be adaptive and responsive as they fulfill their role to prepare students to be responsible, ethical, and contributing members in a digitally literate society. We need to shift how we approach education because we are educating a future that is changing at an exponential rate.

In my school, we have prioritized computer science and cybersecurity education. Digital citizenship is an integrated part of library skills but also in content areas (e.g., math, social studies, science) as students use online resources, platforms, and tools to understand and complete learning goals. Students learn how to evaluate information, protect their passwords, establish a positive digital identity, and use strategies to use when they encounter online risks. In addition, we have introduced computer science from kindergarten on up through STEM activities, robotics, and “unplugged” activities [e.g., art, music, mapping, body movement (See Fig. 1)]. We have partnered with high school departments to bring Hour of Code to our students, community members to share their computer science/cybersecurity training and careers, and family nights to share what we are doing. Most importantly, we have come to realize that these concepts and skills are not isolated. They can - and must - be a layer of embedded instruction that lifts learning so students can acquire transferable skills apply in any situation.

**Figure 1**

*Dancing teaches the computer science concepts of loops and sequences in a concrete way*



In fact, computer science isn't about computers at all, but rather about a specific way of thinking. More importantly, it's "a set of skills that teachers can integrate into other academic areas, so students get a sense of how broadly applicable it is" (Valenzuela, 2020). However, students will not recognize this on their own, and educators need to be intentional about teaching it. In turn, we will help students be more intentional in their own lives and make deeper connections to their lives. Computer science encourages students to engage in real-world and personalized learning that keeps them intrinsically motivated, thoroughly engaged, and thinking at phenomenally high levels (PBS Education, 2018). In a sense, computer science is the foundation for all learning in school and beyond.

I have witnessed this during our schoolwide STEM days. Nearly four hundred K – 5 students rotate between various stations that include technology and "unplugged" activities. During this time, they create and collaborate with each other. They fail, and then they try again – and sometimes again and again. They design, engineer, and construct. They problem solve, persevere, innovate, and adapt. Most notably, *every* child fully engages, and not one behavior problem occurs. Students discover they can do things they never thought possible, and the more experiences students had with these opportunities, the more thoughtful, developed, innovative they became.

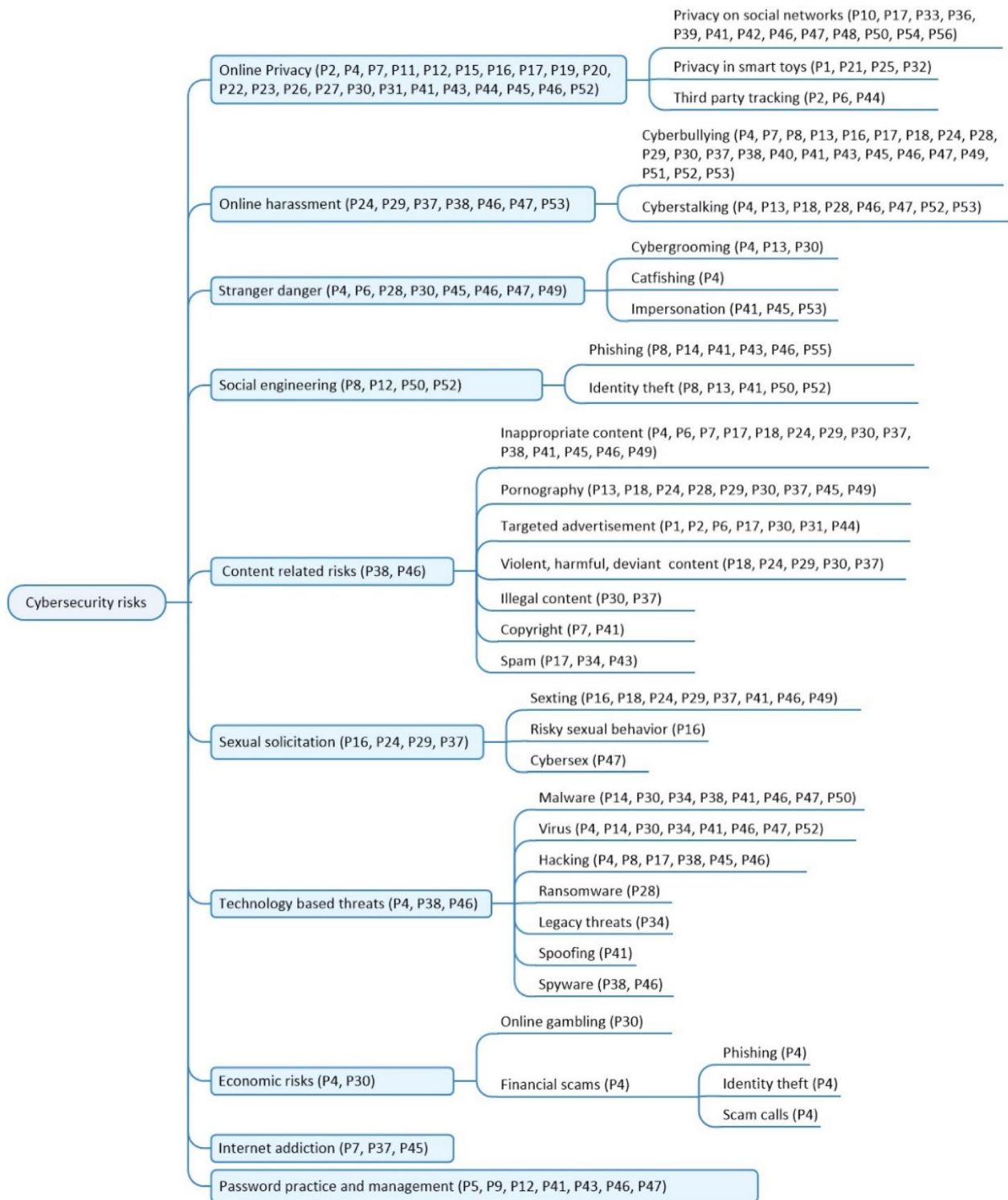
At this point, technology is not an optional component in schools. Although more districts are moving to personal devices, simply having devices does not guarantee computer science and cybersecurity education. Consequently, digital empowerment becomes an issue of digital disenfranchisement without sustained and intentional instruction. We cannot accept that it is a choice whether students receive this critical instruction especially considering the implications as digital space is where youth are spending an increasing portion of their lives. The

reality is children are developing more of their personal identity from online influences than ever before, and often without their knowledge. According to ParentCo. (2022), “children typically have a digital identity by the sixth month of their lives, although some may have one before they're even born including ultrasound images and other details. By the time they're old enough to sign up for their own accounts, they typically have about 2000 photos defining them online” (par. 8).

According to the International Journal of Child-Computer Interaction (2021), “risks have now become part of children’s everyday lives because they grow up immersed in technology to a degree that earlier generations would have found unimaginable” (p. 3). Our youth face issues such as privacy concerns, cyberbullying, content-related risks, internet addiction, and stranger danger on a daily basis (See Fig. 2). In fact, about one in four youth will experience identity theft or fraud before the reach the age of 18 because of online privacy risks including geo-tagging, data surveillance, targeted advertisement, audio injection attacks, and eavesdroppers (See Fig. 3). And students’ digital sphere keeps growing with easy access and minimal knowledge of the risks and long-term consequences.

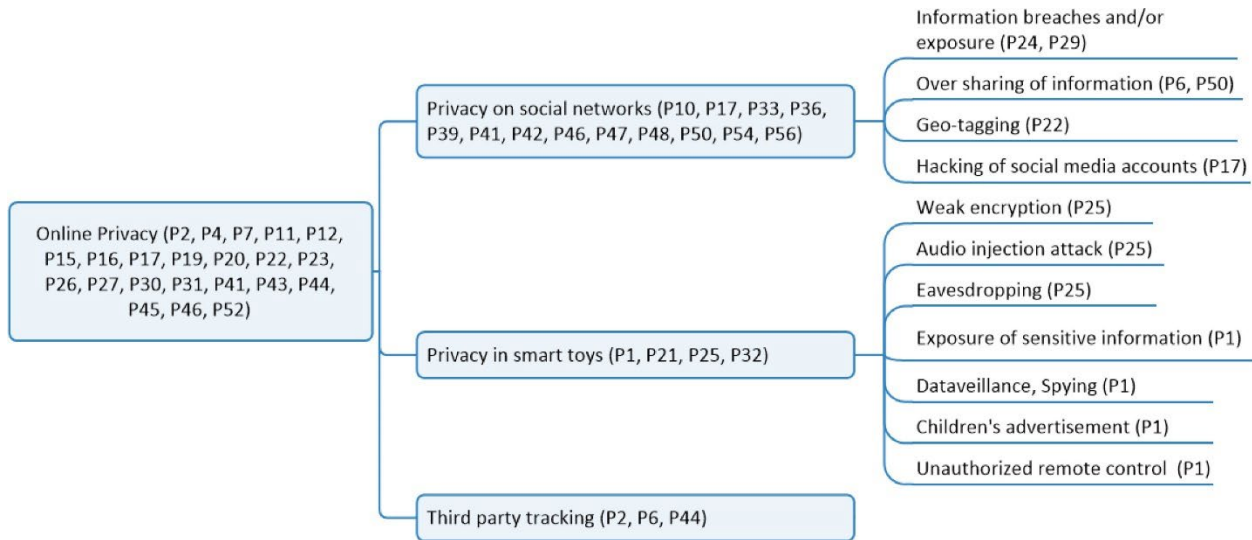
## **Figure 2**

*Cybersecurity Risks*



**Figure 3**

*Privacy-Related Risks*



Fortunately, the increased use of online educational tools creates the opportunity for educators to simultaneously teach students basic cybersecurity skills and encourage them to be experts themselves. Just as we teach washing hands and covering a cough, we need to teach digital hygiene. Just as we teach safety for riding bike and crossing the street, we need to teach cybereducation. Research has shown that explicit cybersecurity instruction will increase children’s privacy awareness, influence their online behavior, and heighten their cognition of risks and benefits using technology.

The duality of technology is undeniable. Because of technology, our children are faced with threats, but they are also met with limitless opportunities. Likewise, our attempts to keep students safe in the world do not transfer to the digital situations students encounter. Regardless of your personal thoughts about technology, the reality is, it is not going away. In fact, you if you grab your cell phone, you will be holding the oldest piece of technology that will ever be seen. Some may say, “But we always teach technology. After all, we do have computers in school.”



Sometimes it is said to be the hidden curriculum just like critical thinking, problem solving, and analytical reasoning. However, we can no longer afford to keep computer science and cybersecurity hidden. Teachers recognize the need for it. Parents are asking for it. Our kids deserve it. We owe students our commitment to *guarantee* computer science and cybersecurity education.

Mr. Chairman and Members of the Committee, that concludes my prepared testimony, and I will stand for any questions that you may have.

ComputerScience.org. (2021, September 28). *Computer Science Programs in North Dakota*.

<https://www.computerscience.org/online-degrees/north-dakota/#:~:text=Computer%20Science%20Careers%20in%20North%20Dakota&text=Graduates%20pursue%20roles%20as%20computer,grow%2013%25%20nationally%20by%202026>.

ParentCo., (2022, June). *How to help your child build and maintain a positive digital identity*.

<https://www.parent.com/blogs/conversations/how-to-help-your-child-build-and-maintain-a-positive-digital-identity>.

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Quayyum, F., Cruzes, D. S., & Jaccheri, L. (2021). Cybersecurity awareness for children: A systematic literature review. *International Journal of Child-Computer Interaction*, 30(1), <https://doi.org/10.1016/j.ijcci.2021.100343>

Valenzuela, J. (2020, September 9). *3 ways to integrate computer science in other classes*. <https://www.edutopia.org/article>.



**HB 1398**  
**Testimony of Terry Effertz**  
**Executive Director - TechND**

Chairman Elkin and members of the Senate Education Committee:

My name is Terry Effertz and I'm the executive director of TechND, an association founded by North Dakota business, government and education leaders in the year 2000. TechND advocates for a positive technology business climate, addresses workforce needs, encourages infrastructure development and provides knowledge-sharing opportunities.

On behalf of TechND, please accept our support of HB 1398. As we move further into the 21st century, technology has become an increasingly important aspect of our lives. It has changed the way we work, communicate, and even learn. That's why it's essential that our schools keep up with these changes and equip our students with the necessary skills to succeed in the digital age. Computer science and cybersecurity in education has numerous benefits.

1. Technology makes learning more interactive and engaging. With the help of digital tools students can learn complex concepts in a more accessible and enjoyable way. This type of learning makes it easier for students to remember the information they learn, resulting in a better understanding of the material.
2. Technology provides access to a wealth of information. Students can quickly and easily research various topics and find a vast array of sources. This helps students to broaden their knowledge and gain a more comprehensive understanding of the subjects they are studying, which is a skill that will serve them for life.
3. As technology continues to advance, it becomes an increasingly important skill in the workforce. By integrating technology into the classroom, we can ensure that our students are adequately prepared for the demands of the modern workforce. It's essential that we equip our students with the skills they need to succeed in the digital age and take advantage of the numerous job opportunities that come with it.

Technology has become an integral part of our daily lives, and it's crucial that our education system reflects this. By integrating technology into our high school education system, we can provide our students with the skills and knowledge they need to succeed in the digital age. It's up to us to ensure that our students are prepared for the challenges and opportunities that lie ahead. I urge this committee to give HB 1398 a "do-pass" recommendation.



EMERGING PRAIRIE

March 15, 2023

Subject: Letter of Support for HB 1398

Mr. Chairman and Members of the Senate Education Committee,

Emerging Prairie supports House Bill 1398 and its goal to increase computer science and cybersecurity education in North Dakota.

Emerging Prairie energizes communities. We believe that as we weave the startup, innovation, and technology ecosystems together and move them forward, we will be able to maximize the state's potential and see catalytic community and economic development.

In our work helping to build the technology ecosystem in our state, through efforts such as Emerging Digital Academy, we have seen the positive impact of those entering the technology field. From life-changing opportunities, to the advancement of key industries, to the ripple effects in their communities.

All of this has been made possible through education, and we believe that to continue building a successful technology ecosystem in an ever technical and digital world, we need to provide as many tools as possible to those curious learners who are our state's future. Tools such as increased access to computer science education.

For these reasons, Emerging Prairie supports this legislation.

Sincerely,

Greg Tehven  
CEO & Co-founder  
Emerging Prairie



**Testimony of Kirsten Baesler**  
**North Dakota Superintendent of Public Instruction**  
**Senate Education Committee**  
**In Support of HB 1398**  
**Wednesday, March 15, 2023**

Chairman Elkin and members of the Senate Education Committee.

My name is Kirsten Baesler. I am the North Dakota Superintendent of Public Instruction, and I am here to speak in support of House Bill 1398.

Good morning, everyone. It has been a while since I have been in front of you. At the NDDPI presentation during the first days of the session, I said you would not see me testify often – and that the NDDPI team would most often provide **information** on the bills you consider instead of giving testimony in “opposition to” or “support of” legislation.

I said that day that the only bills you will likely hear me take a position on are those that will have a DIRECT impact on children and their future.

This is one of those issues.

The ND Constitution, Article V Section 2, explicitly identifies the Superintendent of Public Instruction as the constitutional officer overseeing public education in our state, acting only through the authority prescribed by law through the legislative assembly.

Article VIII Section 1 of the North Dakota Constitution states that the **Legislative Assembly** “shall make provision for the establishment of a **system** of public schools which shall be open to all children of the state of North Dakota...” and Section 2, “The legislative assembly **shall** provide for a uniform system of free

public schools throughout the state, beginning with the primary and extending through all grades up to and including schools of higher education...”

What this means is that the **legislative assembly** is the primary stakeholder in the state’s public education system. The Superintendent of Public Instruction is a secondary stakeholder overseeing the execution of the state’s K12 education laws and expectations, acting only on the authority prescribed by the legislative assembly.

An important contributor to implementing the will of the legislative assembly is the public school systems, including teachers, administrators, school boards, and all school staff in partnership with parents.

As the bill’s sponsor said during its introduction, during the 2021 special session, HB 1507 was passed, in which a new duty was added to NDCC 15.1-02-04, the Superintendent of public instruction – Duties. The new **requirement** that the legislative assembly directed that its constitutional officer accomplish stated that the Superintendent “**Shall** collaborate with workforce development stakeholders and the kindergarten through grade twelve education coordination council to determine how best to integrate computer science and cybersecurity into elementary, middle, and high school.”

The directive given by the legislative assembly wasn’t “if” this should be done. It wasn’t a study to consider this. It is a clear directive to work together to determine “how to best” get it done.

I took that directive seriously, and a task force was formed. The many groups who contributed to this bill worked hard to collaborate and compromise to deliver this solution to you.

The bill sponsor offered an amendment of a section of the bill that was inadvertently omitted by the legislative council during official drafting related to high school and allowed guidance to be written, set a limit, and expanded the potential partners to enable efficient delivery of the grant funding. These were adopted by the House with everyone's full support and approval.

I ask that you do not amend the bill any further. What you see before you is the result of over a year of meetings, statewide travel, and, simply put, a **long journey** to find language that is acceptable to our educators, business chambers, cyber defense experts, industry, and families. But **most importantly**, what you have is a bill that serves the needs of our children based on the needs of **their** future.

Here is a summary of the history of this journey.

### **History of Computer Science and Cybersecurity Timeline**

**October 2015** – North Dakota Department of Public Instruction forms a working group of diverse stakeholders, including legislators, to work on a plan for K-12 education relating to computer science and cybersecurity needs.

**January 2017** – Working group presents the plan to the 2017 Legislative Assembly.

**September 2018** – North Dakota computer science and cybersecurity educators from our K-12 schools and university system, as well as industry experts, began

developing CS and Cybersecurity Standards. The writing committee's draft was made available for public comment, which generated valuable opinions from teachers, administrators, parents, and the community. A panel of business and community leaders and public representatives provided another layer of review.

**February 2019** – North Dakota adopted the nation's first K-12 Computer Science & Cybersecurity Standards.

<https://www.nd.gov/dpi/sites/www/files/documents/Academic%20Support/CSCS2019.pdf>

**April 2019** - The 2019 legislative assembly gave the superintendent of public instruction authority to create computer science and cybersecurity credentials for educators to add to their teaching licenses.

**April 2020** – ND Administrative Code 67-11-22 established three levels of CS and Cybersecurity Credentials

- Level 3 – allows integration of CS/Cyber within other content areas.
- Level 2 – allows teaching of intro level CS/Cyber courses.
- Level 1 – allows teaching of more advanced CS/cyber courses that result in Carnegie course credits

**Nov 2021** – conclusion of 67<sup>th</sup> Special Session

- Tasked the State Superintendent to “collaborate with workforce development stakeholders and the kindergarten through grade twelve education coordination council to determine how best to integrate computer science and cybersecurity
- Established co-chairs of the task force.
  - ✓ James Leiman - Commissioner, Department of Commerce
  - ✓ Shawn Riley – State Chief Information Officer



✓ Kirsten Baesler – State Superintendent

**December 2021** – Identified task force members to ensure all impacted/concerned entities were represented

**Feb 2022** - Initial Meeting

- Divided into subcommittees.
  1. Technical Subcommittee
  2. Awareness Subcommittee

**Mar/Apr 2022** – established document repositories and email channels to drive future agendas.

**May 6, 2022** – Technical Subcommittee meeting

**May 13, 2022** – Awareness subcommittee meeting

- Subcommittees looked at the needs of:
  1. Students – how to best prepare them for future success regardless of career path.
  2. Current teachers – what support and professional development are required?
  3. Preservice teachers – how to prepare them to educate the 21<sup>st</sup>-century student.
  4. School administration – how to ease their burden and allow for differences at each location.

**Jun/Jul/Aug – 2022**- worked on shared documents/drove to upcoming meeting agenda.

**Aug 3, 2022** – Full task force meeting

- Reviewed discussions and recommendations from each subcommittee.
- Formulated final recommendations.

**September 2022** – task force finalized recommendations and verified consensus among members.

**October 2022** - presented final recommendations to Legislative Interim Policy Committee.

- Interim committee requested more work be done to provide compromise and a higher degree of comfort among school administrators and directed Superintendent Baesler to bring it back to the legislative assembly during the 2023 regular session.

**October 2022- January 2023** – Superintendent Baesler travels to meet with numerous stakeholders across the state, including school administrators, principals, teachers, families, and business leaders, to develop consensus on the bill’s language.

A copy of the task force members and their September 2022 recommendations are provided with this testimony.

This process and the resulting language in this bill are the perfect examples of complying with the ND Constitution and honoring the tradition of local control.

1. The Legislative assembly has the right – and the responsibility - to establish expectations for a uniform education system available to all children.
2. The constitution directs the assembly to prescribe laws for the Superintendent of public instruction to execute and achieve those expectations.
3. Local control is provided for local school boards, administrators, and teachers to decide how to best implement daily operations to meet the state’s expectations.

**February 2023** – The House overwhelmingly passes HB 1398

During this process, one thing that was clear among all participants – no one, not a single task force member or any stakeholder member I talked to during this journey, has disagreed with the **importance** of ensuring that all students have access to and receive instruction in computer science and cybersecurity. In fact, they all agree wholeheartedly that it is very important. The challenge came when the discussion turned to what adults must do to make that happen for our students. That's when the discussion got hard. And it got hard because it required adults to do something different, to figure out a way to do something differently, and think about schedules, training, and delivery differently. Doing something different is not always easy. I get that, and I understand that. But student outcomes don't change -will never change - until adult behaviors change. And public education is not here to serve the needs of adults; it exists to prepare students for their future. If we all agree that it is the right thing to do, but we don't do it because it is hard – then shame on us. Adults must find the answer that is best for children, not adults.

To demonstrate how solutions can be and have been found, I share with you an exchange that I had with one educational leader:

1. A graduate today should have a background in computer science and especially cyber security. Ask employers about how much money they spend on cyber security.
2. But these are some problems posed to me by colleagues and maybe something for you to think about solving:
  - a. financial burden on small schools that will have to pay ND Center for Distance Ed to offer the course. How can we help these schools? My cousin's kids go to a small school in SW ND, and should have the same opportunities as mine. **For the 2023-2025 biennium, NDDPI has allocated \$600,000 from its ESSER (Covid funding) to grant to NDCDE to cover the Center's estimated costs to educate students who do**

not have a teacher in their school to teach the course. Covering this first biennium will give schools time to get one of their teachers trained and will provide time to determine a baseline amount of funding that CDE would need in the future to continue this support to our small schools for this course.

- b. Personnel problems in schools the size of XXX. We may now have extra science teachers because kids won't take as many science classes, but we will need to train or hire someone new. Could we offer some training with pay in the summer for teachers who want to become credentialed? DPI is allocating \$2M in ESSER funding to train and credential one CSC teacher per 200 students. This equates to 720 teachers across ND. We currently have more than 400 credentialed teachers.
  - i. For the past two summers (2021, 2022), NDDPI and NDIT EduTech have partnered with Bismarck State College to host a 4-day IgniteND Summit on BSC Campus. After those four days, teachers will have enough hours to have earned their Level III Computer Science and Cybersecurity Credential to add to their teaching license. NDDPI provides scholarships to all interested teachers that cover the cost of registration, BSC housing, and food and pays the teacher a \$500 stipend for their time. IgniteND 2023 Summit will be held this June again.
  - ii. ND Dept of Commerce has scholarships available to teachers wishing to complete the Cyber Educator training program at BSC.
  - iii. NDIT EduTech has dozens of courses - most at \$0 cost and available online – that educators can take to get credentialed. See here for a list [NDIT-EduTech Training](#)
- c. We FINALLY have a computer science teacher at XHS, after being unable to find someone for multiple years. Imagine a Beulah or Scranton trying to find someone. If we require this for graduation, we will have to train or hire someone besides our existing teacher. What happens if we can't find anyone who wants the training? If a school district cannot find a willing teacher to receive training, then CDE could be utilized. Another option might be to leverage the Community Expert teacher authorized under 15.1-18-10 or the Learn

Everywhere opportunities authorized under 15.1-07-35 to meet the requirements of this bill.

- i. I say this realizing my hypocrisy in that in business and industry if the organization doesn't adapt, it dies. We are training kids for the real world!

Educators will say you are taking local control away from School Boards. The legislative assembly has always set the minimum expectations of what schools must offer to be approved to operate in North Dakota. These are listed in 15.1-21-01 (Required Instruction) and 15.1-21-02 (Required Units.) Further, the state legislature has always been the authority in determining the minimum requirements for students to earn a North Dakota high school diploma, 15.1-21-02.2. This is to fulfill Article VIII of our State Constitutions that states, “The legislative assembly shall make provision for the establishment and maintenance of a system of public schools which shall be open to all children of the state of North Dakota ....” And “The legislative assembly shall provide for **a uniform system** of free public schools throughout the state,”

This bill does respect the long-standing tradition of local control by allowing school boards to decide **how** to meet the basic requirements set forth by the legislative assembly by developing a Computer Science Cyber Security integration plan that fits the local context of each community. The language in the bill states, “Develop a computer science and cybersecurity integration plan to ensure introduction to computer science and cybersecurity knowledge. The **board of the public school or school district shall approve** a plan by July 1, 2024.”

Members of the Committee, North Dakota must keep its children from falling further behind. Other states and countries already require this. As the bill sponsor mentioned earlier, 25 out of 29 European countries have computer science in their mandatory curriculum, with 17 countries making it mandatory in both primary and secondary schools.

Five states require computer science for graduation, and that number is growing. Since the 2021 special legislative assembly added this to the superintendent's duties, state legislatures across the U.S. have enacted laws to make this a requirement, and more are considering it this winter.

You have heard that this learning is foundational. It is imperative to our children's success – and safety. One of the most common kindergarten activities is to have the students plant a seed in a cup of soil at the beginning of the year. We do because we want them to know that a seed that is placed in soil, when given the right of sunlight and water, grows into a plant that becomes our food. We don't do this because we want all 5-year-olds to grow up to be farmers or agronomists. We do it because food is a part of every child's daily life, and they need to understand how it works. Every fifth-grade student learns about electricity and the electrical circuit. We don't do this because we want them to grow up to be electricians or electrical engineers. We do it because they need to know how that powerful element in our lives can be harnessed for good to help improve our lives instead of hurting us. We have come to that point with computer science and cybersecurity. It is part of our everyday lives. We need to know how and why it works. And we need to teach our children how to harness it for good, not let it hurt them.

You have heard about some good programs today. And I, too, get to see many good programs in the state, but after nearly eight years of incentivizing and providing state support to scale and grow access to computer science, only 44% of ND high schools even offer a computer science course – which is below the national average. It is right for the legislative assembly to exercise its

constitutional responsibility to establish the expectations of every school to establish a uniform education system available to ALL students. Every child has ability – but what they lack most severely in rural states like North Dakota is **access to opportunity!**

The state with the highest number of computer science or cyber security jobs in the nation is California. That makes sense with Silicon Valley, right? But guess what location is the second highest? It's remote. You can work from anywhere. You can ranch your family's land, volunteer for the community fire department or ambulance service, and still make \$70-\$80,000 a year. Imagine what this could mean to our young people and to this state. While over 14,000 Native American students attend high schools in North Dakota (11.13% of the population), only 133 are taking a computer science course. We should not be satisfied with that number. We can do better.

We have reached a point where computer science and cybersecurity are as important as reading and mastery of 8<sup>th</sup>-grade math became in the early 1900s. Student outcomes don't change until adult behaviors change.

Mr. Chairman and members of the committee, I urge a "do pass" vote on HB 1398.

I welcome any questions you may have.

## Every Student, Cyber Literate Act

### 2021-2022 school year

- 89 high schools (of 177 public and 16 nonpublic schools) offered CS and Cybersecurity courses
- 6,850 (of 117,000 public and 8,500 nonpublic students) took CS and Cyber courses

### Definitions

**Computer Science** refers to the study of computers and algorithmic processes, including their principles, their hardware and software designs, their [implementation], and their impact on society.

**Educational Technology** is the process of integrating technology into education in a way that promotes a more diverse learning environment and a way for students to learn how to use technology as well as their common assignments.

**Digital Citizenship** refers to the appropriate and responsible use of technology, such as choosing an appropriate password and keeping it secure.

**Information Technology** often overlaps with computer science but is mainly focused on industrial applications of computer science, such as installing and operating software rather than creating it. Information technology professionals often have a background in computer science.

**Computational Thinking** is a way of solving problems, designing systems, and understanding human behavior that draws on concepts fundamental to computer science. Defining characteristics of computational thinking include comprehension of algorithms as well as decomposition, pattern recognition, and data representation.

**Cybersecurity** is a set of techniques used to protect the integrity of networks, programs, and data from attack, damage, or unauthorized access.



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## CS and Cybersecurity Taskforce – Synopsis of Recommendations

### Importance of CS and Cybersecurity

Unanimous consensus among the group that Computer Science and Cybersecurity has become foundational knowledge for all K12 students regardless of the occupation they pursue.

### Implementation of CS and Cybersecurity

**Concern:** Larger schools have the available staffing to offer courses in CS and Cyber while smaller schools don't have the same staffing levels; this puts students who attend these smaller schools at a disadvantage

**Solution:** Center for Distance Education (CDE) can fill that void; CDE has committed to adding staff as needed to offer CS and Cyber courses

**Concern:** Integration of CS and Cybersecurity standards into other content areas may have a longer lasting, wider affect than a few stand-alone courses

**Concern:** Each district has different strengths and weaknesses; a 'one-size fits all' integration plan won't work for everyone

**Solution:** Each district can develop their own plan to integrate CS and Cybersecurity Standards

2. The school board, will approve each district's integration plan. (After meeting with ND School Board representative this was changed to be approved at the local district level. This aligns with the Learning Continuum Graduation Pathway philosophy of local approval.)
3. EduTech will develop template integration plans and a rubric that may be used for evaluating each district's plan. Development of the templates and rubric will occur with input from:
  - ND Department of Public Instruction.
  - The ND CS/Cyber Integration Taskforce.
  - The ND K-20W Working Group.
  - Other non-profit K-12 computer science and cybersecurity educational partners.
4. Key categories within the templates and rubric will include, but will not be limited to:
  - Computer Science and Cybersecurity Curriculum Integration
  - Teacher Training and Certifications/Certificates
  - After-school programs or clubs
  - Cyber Hygiene Programs for Staff Safety
5. The rubric is to ensure both awareness and technical application of computer science and cybersecurity knowledge is being integrated.

**Concern:** Adding another course requirement will take away from other electives

**Solution:**

1. CS and Cybersecurity course work could qualify for existing Math and/or Science courses therefore elective options wouldn't be impacted.

2. The integration of CS and Cybersecurity standards into other content areas allows students to receive some knowledge of CS and Cybersecurity while taking other math, science or electives.

**Concern:** How fast would this change need to be in place?

**Solution:** The course offerings (with the help of CDE) could be made available immediately; the integration plan would have a phased (multi-year) implementation.

1. The sample timeline for Every Student, Cyber Literate Act will be as follows:
  - Rubric developed and delivered to school districts by January 2023
  - School district implementation plans due to **School Board** by December 2023
  - School districts to begin implementing integration plan by 2024-2025 school year
2. The schools will utilize their Continuous Improvement Strategy Map for self-evaluation of their integration plan annually with formal review of the district implementation plan every three years by the board.

**Concern:** How will teachers receive training and professional development?

**Solution:** EduTech (a division of NDDIT) has been providing training to school staff in the areas of CS and Cyber. They have been actively promoting their willingness to bring the training to schools.

Currently, over 400 ND teachers have received a CS or Cyber credential to add to their license.

EduTech has multiple training paths and work with schools to adapt their training to the specific needs of the schools.

Bismarck State College has developed a professional development track to provide teachers knowledge and skills to teach CS and Cybersecurity. Other ND colleges are developing similar programs.

Microsoft TEALS program places industry professionals alongside teachers for multiple years to jointly provide content with the intent of providing teachers knowledge and confidence to teach on their own

**Concern:** Cost to implement?

**Solution:** Funding awarded to NDDIT (*grant directly to EduTech*) from NDDPI for purpose of providing professional development in computer science and cybersecurity, paying educators \$500 stipend and covering all registration and lodging costs.

**Concern:** What is the credentialing requirement?

**Solution:** Elementary and Middle school teachers – recommend a CS and Cyber Level 3 or Level 2 credential, but not required

High school teachers – recommend a CS and Cyber Level 2 or Level 1 credential, but not required unless teaching a standalone course

Good morning, Chair Elkin, vice chair Beard and members of the Senate Education Committee, for the record my name is Mike Lefor and I serve District 37 – Dickinson in the House of Representatives. I bring House Bill 1398 for your consideration.

The Superintendent of public instruction convened a taskforce to determine the best way forward to integrate Computer Science and Cybersecurity instruction into all ND Schools. The task force consisted of representatives from workforce, ND legislators, school superintendents, principals from large and small districts (high school, middle, and elementary schools), school board members, family members and students.

HB 1398 requires each school board to develop a plan which works for them. Plans would have to be developed no later than July 1, 2024.

Unanimous consensus was reached among the group that Computer Science and Cybersecurity has become foundational knowledge for all K12 students regardless of the occupation they pursue. The ultimate result of this work is HB 1398.

I will describe the provisions of HB 1398, which are based on the recommendations of the task force I described a moment ago and individual one-on-one work done by the Superintendent with various school leaders across the state to fulfill the duty that was added to 15.1-02-04.

Section 1 of the bill requires Elementary and Middle Schools to provide instruction in computer science and cybersecurity. This means any school, in order for it to be approved to operate in ND, must make available computer science and cybersecurity instruction. This is the same section that requires that schools provide instruction in math, reading, social studies, health, physical education, etc. If a school cannot find a teacher to offer any of these classes, they typically turn to the ND Center for Distance Education (CDE) to provide instruction so the school can continue to operate. The North Dakota Center for Distance Education has confirmed that they will provide the staffing to offer these courses for schools that need them. I believe the Director of CDE will be testifying today.

Section one of the bill also requires elementary and middle schools to develop a computer science and cybersecurity integration plan to ensure introduction to foundational computer science and cybersecurity knowledge. These integration plans are approved by each local school board to ensure that each district has the flexibility to develop a plan that fits into their unique situations. Plans would have to be developed and approved by local school boards no later than July 1, 2024.

Section 2 of the bill requires high schools to make available one unit (credit) of either computer science or cybersecurity. Again, in order for a school to be approved to operate in ND, it must make available a computer science and cyber security course. This is the same section that requires that high schools provide courses in algebra, biology, and electives such as music, foreign language, etc. The North Dakota Center for Distance Education has confirmed that they will provide the staffing to offer these courses for schools that need them. This section also requires high schools to develop a computer science and cybersecurity integration plan to ensure introduction to foundational computer science and cybersecurity knowledge. These integration



Finally, I will talk a little bit about where North Dakota students regarding computer science and cybersecurity.

North Dakota is already falling behind other states and other countries who have taken seriously the need to have students cyber educated. 27 States require all high schools offer CS classes, but North Dakota does not. 12 states require access for all K-12 students, but ND does not. 33 states have dedicated funding for computer science and cybersecurity instruction in schools, but North Dakota does not. In early 2022, the European Commission's Joint Research Centre (JRC) released *Reviewing Computational Thinking In Compulsory Education*. Of the 29 European countries included in the study, 25 countries have basic computer science concepts in their mandatory curriculum, with 17 countries making it mandatory in both primary and secondary schools.

Even though DPI has been providing no-cost training, resources and support to incentive our schools for several years only 76 high schools in North Dakota (about 44%) offer a foundational computer science course. This is well below the national average. The schools offering computer science are the larger school districts, putting our rural students at a significant disadvantage. (Ref- Computer Science Access Report Data Code.org).

In ND, 32.9% of unemployed individuals lack foundational digital skills, meaning that they can't compete for 72.7% of the open jobs in the state. Although all our most in-demand jobs require at least a basic digital skillset, there are currently 1,389 open computing jobs in the state of North Dakota. (Ref- Promote Computer Science Code.org and Digital Equity Scorecard digitalinclusion.org).

The 21st Century workforce needs 21<sup>st</sup> century skills. To ensure North Dakota remains competitive in national and international markets, we need every adult worker, jobseeker, and student graduating with at least basic knowledge of computers and how modern systems communicate, even if they are not going to specialize in a cyber career. We can't expect students to start at the high school level; we need computer science and cybersecurity courses at elementary and middle school levels as well. For example, math skills are important, so we don't start teaching math at high school level, we begin education in math concepts in elementary and middle school.

In addition to the 27 states that require high school courses, and the states that require it in all grades, currently five states require computer science for graduation, and that number is growing. State legislatures across the U.S. are enacting laws to make this a requirement.

For those who wonder how this aligns to the established mission of the PK12 Strategic Vision of North Dakota Education, the answer is simple: We cannot ensure that "All students will graduate Choice Ready, with knowledge, skills, and disposition to be successful" without it.

North Dakota cannot afford to let another year pass without ensuring our students remain competitive.

During the 2021 special session HB 1507 created a new duty to the department as follows: The superintendent shall collaborate with workforce development stakeholders and the kindergarten

23.0970.02000

FIRST ENGROSSMENT

Sixty-eighth  
Legislative Assembly  
of North Dakota

ENGROSSED HOUSE BILL NO. 1398

Introduced by

Representatives Lefor, Bosch, Novak, O'Brien, Schreiber-Beck

Senators Rummel, Rust, Vedaa

1 A BILL for an Act to create and enact a new section to chapter 15.1-26 of the North Dakota  
2 Century Code, relating to computer science and cybersecurity instruction for adult learners; to  
3 amend and reenact sections 15.1-21-01, 15.1-21-02, and 15.1-21-02.2 of the North Dakota  
4 Century Code, relating to mandatory computer science and cybersecurity instruction and  
5 minimum requirements for high school graduation; and to provide an expiration date.

6 **BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:**

7 **SECTION 1. AMENDMENT.** Section 15.1-21-01 of the North Dakota Century Code is  
8 amended and reenacted as follows:

9 **15.1-21-01. Elementary and middle schools - Required instruction.**

10 ~~In order to~~To be approved by the superintendent of public instruction, each public and  
11 nonpublic elementary and middle school shall ~~provide:~~

12 1. Provide to students instruction in:

13 ~~1-a.~~ English language arts, including reading, composition, creative writing, English  
14 grammar, and spelling.

15 ~~2-b.~~ Mathematics.

16 ~~3-c.~~ Social studies, including:

17 ~~a.(1)~~ The United States Constitution;

18 ~~b.(2)~~ United States history;

19 ~~c.(3)~~ Geography;

20 ~~d.(4)~~ Government; and

21 ~~e.(5)~~ North Dakota studies, with an emphasis on geography, history, the federally  
22 recognized Indian tribes in the state, and agriculture of this state, in the  
23 fourth and eighth grades.

24 ~~4-d.~~ Science, including agriculture.



- 1           ~~5.e.~~ Physical education.
- 2           ~~6.f.~~ Health, including physiology, hygiene, disease control, and the nature and effects  
3                           of alcohol, tobacco, and narcotics.
- 4           ~~g.~~ Computer science, including cybersecurity.
- 5           2. Develop a computer science and cybersecurity integration plan to ensure introduction  
6           to foundational computer science and cybersecurity knowledge. The board of a public  
7           school or school district shall approve a plan by July 1, 2024.

8           **SECTION 2. AMENDMENT.** Section 15.1-21-02 of the North Dakota Century Code is  
9 amended and reenacted as follows:

10           **15.1-21-02. High schools - Required units.**

- 11           1. ~~In order to~~To be approved by the superintendent of public instruction, each public and  
12 nonpublic high school shall provide instruction in or make available to each student:
- 13           a. Four units of English language arts from a sequence that includes literature,  
14                           composition, and speech;
- 15           b. Four units of mathematics, including:
- 16                           (1) One unit of algebra II; and
- 17                           (2) One unit for which algebra II is a prerequisite;
- 18           c. Four units of science, including:
- 19                           (1) One unit of physical science; and
- 20                           (2) One unit of biology;
- 21           d. Four units of social studies, including:
- 22                           (1) One unit of world history;
- 23                           (2) One unit of United States history, including Native American tribal history;
- 24                           and
- 25                           (3) (a) One unit of problems of democracy; or
- 26                                 (b) One-half unit of United States government and one-half unit of
- 27   economics;
- 28           e. One-half unit of health;
- 29           f. One-half unit of physical education during each school year, provided that once  
30                           every four years the unit must be a concept-based fitness class that includes

- 1 instruction in the assessment, improvement, and maintenance of personal  
2 fitness;
- 3 g. Two units of fine arts, at least one of which must be music;
- 4 h. Two units of the same foreign or native American language;
- 5 i. One unit of an advanced placement course or one unit of a dual-credit course;
- 6 ~~and~~
- 7 j. Two units of career and technical education from a coordinated plan of study  
8 recommended by the department of career and technical education and  
9 approved by the superintendent of public instruction; and
- 10 k. One unit of computer science or cybersecurity.
- 11 2. In addition to the requirements of subsection 1, each public and nonpublic high school  
12 shall make:
- 13 a. Make available to each student, at least once every two years, one-half unit of  
14 North Dakota studies, with an emphasis on the geography, history, and  
15 agriculture of this state; and
- 16 b. Develop a computer science and cybersecurity integration plan to ensure  
17 introduction to computer science and cybersecurity knowledge. The board of a  
18 public school or school district shall approve a plan by July 1, 2024.
- 19 3. Each unit which must be made available under this section must meet or exceed the  
20 state content standards, unless a school district or governing board of a nonpublic  
21 high school has adopted a mastery framework policy and awards units based on the  
22 successful completion of the relevant portions of the North Dakota learning continuum.  
23 A mastery framework policy adopted by a school district or governing board of a  
24 nonpublic high school must identify the portions of the North Dakota learning  
25 continuum which must be mastered for a student to attain units necessary for high  
26 school graduation under section 15.1-21-02.2.
- 27 4. For purposes of this section, unless the context otherwise requires, "make available"  
28 means that:
- 29 a. Each public high school and nonpublic high school shall allow students to select  
30 units over the course of a high school career from a list that includes at least  
31 those required by this section;



- 1           b. If a student selects a unit from the list required by this section, the public high  
2           school or the nonpublic high school shall provide the unit to the student; and
- 3           c. The unit may be provided to the student through any delivery method not  
4           contrary to state law and may include classroom or individual instruction and  
5           distance learning options, including interactive video, computer instruction,  
6           correspondence courses, and postsecondary enrollment under chapter 15.1-25.
- 7       5. The board of a school district may not impose any fees or charges upon a student for  
8       the provision of or participation in units as provided in this section, other than the fees  
9       permitted by section 15.1-09-36.
- 10   6. If in order to meet the minimum requirements of this section a school district includes  
11   academic courses offered by a postsecondary institution under chapter 15.1-25, the  
12   school district shall:
  - 13       a. Pay all costs of the student's attendance, except those fees that are permissible  
14       under section 15.1-09-36; and
  - 15       b. Transport the student to and from the location at which the course is offered or  
16       provide mileage reimbursement to the student if transportation is provided by the  
17       student or the student's family.
- 18   7. The requirements of this section do not apply to alternative high schools or alternative  
19   high school education programs.
- 20   8. The requirements of subdivisions g and h of subsection 1 do not apply to the North  
21   Dakota youth correctional center.

22       **SECTION 3. AMENDMENT.** Section 15.1-21-02.2 of the North Dakota Century Code is  
23   amended and reenacted as follows:

24       **15.1-21-02.2. High school graduation - Minimum requirements. (Effective through**  
25   **July 31, 2025)**

- 26   1. Except as provided in section 15.1-21-02.3 and subsection 2, the following twenty-two  
27   units of high school coursework constitute the minimum requirement for high school  
28   graduation:
  - 29       a. Four units of English language arts from a sequence that includes literature,  
30       composition, and speech;

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- 1           b. Three units of mathematics, which may include one unit of computer science  
2           approved by the superintendent of public instruction;
- 3           c. Three units of science, consisting of:
- 4           (1) (a) One unit of biology;
- 5                 (b) One unit of chemistry; and
- 6                 (c) One unit of physics; or
- 7           (2) (a) One unit of biology;
- 8                 (b) One unit of physical science; and
- 9                 (c) One unit or two one-half units of any other science which may include  
10                 one unit of computer science or cybersecurity approved by the  
11                 superintendent of public instruction;
- 12          d. Three units of social studies, including:
- 13          (1) One unit of United States history;
- 14          (2) (a) One-half unit of United States government and one-half unit of  
15                 economics; or
- 16                 (b) One unit of problems of democracy; and
- 17          (3) One unit or two one-half units of any other social studies, which may include  
18                 civics, civilization, geography and history, multicultural studies, North Dakota  
19                 studies, psychology, sociology, and world history;
- 20          e. (1) One unit of physical education; or
- 21                 (2) One-half unit of physical education and one-half unit of health;
- 22          f. Three units of:
- 23                 (1) Foreign languages;
- 24                 (2) Native American languages;
- 25                 (3) Fine arts; or
- 26                 (4) Career and technical education courses; and
- 27          g. Any five additional units.
- 28          2. If approved by the board of a school district or nonpublic school, a school district or  
29                 nonpublic school may develop eligibility criteria or programmatic requirements to allow  
30                 a passing score on the relevant portions of the GED assessment to receive credit for  
31                 the corresponding requirements of subdivisions a through d of subsection 1.

1       **High school graduation - Minimum requirements. (Effective after July 31, 2025)**

- 2       1. Except as provided in section 15.1-21-02.3 and subsection 2, the following twenty-two  
3       units of high school coursework constitute the minimum requirement for high school  
4       graduation:
- 5       a. Four units of English language arts from a sequence that includes literature,  
6       composition, and speech;
- 7       b. Three units of mathematics, which may include one unit of computer science  
8       approved by the superintendent of public instruction;
- 9       c. Three units of science, consisting of:
- 10       (1) (a) One unit of biology;
- 11       (b) One unit of chemistry; and
- 12       (c) One unit of physics; or
- 13       (2) (a) One unit of biology;
- 14       (b) One unit of physical science; and
- 15       (c) One unit or two one-half units of any other science which may include  
16       one unit of computer science or cybersecurity approved by the  
17       superintendent of public instruction;
- 18       d. Three units of social studies, including:
- 19       (1) One unit of United States history, including Native American tribal history;
- 20       (2) (a) One-half unit of United States government and one-half unit of  
21       economics; or
- 22       (b) One unit of problems of democracy; and
- 23       (3) One unit or two one-half units of any other social studies, which may include  
24       civics, civilization, geography and history, multicultural studies, North Dakota  
25       studies, psychology, sociology, and world history;
- 26       e. (1) One unit of physical education; or
- 27       (2) One-half unit of physical education and one-half unit of health;
- 28       f. Three units of:
- 29       (1) Foreign languages;
- 30       (2) Native American languages;
- 31       (3) Fine arts; or

- 1 (4) Career and technical education courses; ~~and~~  
2 g. Any five additional units; and  
3 h. One unit of computer science or cybersecurity whether under subdivision b, c, or  
4 both.  
5 i. The requirements of subdivision h of subsection 1 are waived if the student has  
6 completed a computer science and cybersecurity integration plan approved by  
7 the school board.  
8 2. If approved by the board of a school district or nonpublic school, a school district or  
9 nonpublic school may develop eligibility criteria or programmatic requirements to allow  
10 a passing score on the relevant portions of the GED assessment to receive credit for  
11 the corresponding requirements of subdivisions a through d of subsection 1.

12 **SECTION 4.** A new section to chapter 15.1-26 of the North Dakota Century Code is created  
13 and enacted as follows:

14 **Authority - Adult learning - Computer operations and cybersecurity instruction.**

15 The superintendent of public instruction shall provide grants not to exceed three hundred  
16 thousand dollars total to school districts, nonpublic schools, area career and technology  
17 centers, job service North Dakota workforce centers, public libraries, adult education centers  
18 and learning centers that qualify as nonprofit entities under section 501(c)(3) of the federal  
19 Internal Revenue Code [26 U.S.C. 501(c)(3)] to offer computer operations and cybersecurity  
20 courses for adults, for the biennium beginning July 1, 2023, and ending June 30, 2025.

21 School districts, nonpublic schools, public libraries, area career and technology centers, job  
22 service North Dakota workforce centers, adult education centers and learning centers that  
23 qualify as nonprofit entities under section 501(c)(3) of the federal Internal Revenue Code  
24 [26 U.S.C. 501(c)(3)] shall use all or part of the grant money to pay a stipend to a teacher of the  
25 course.

26 The superintendent of public instruction shall create guidance to implement the grant  
27 program.

28 **SECTION 5. EXPIRATION DATE.** Section 4 of this Act is effective through June 30, 2025,  
29 and after that date is ineffective.



**FISCAL NOTE**  
**HOUSE BILL NO. 1398**  
**LC# 23.0970.02000**  
**02/15/2023**

**1 - State Fiscal Effect**

*Identify the state fiscal effect and the fiscal effect on agency appropriations compared to funding levels and appropriations anticipated under current law.*

	2021-2023 Biennium		2023-2025 Biennium		2025-2027 Biennium	
	General Fund	Other Funds	General Fund	Other Funds	General Fund	Other Funds
Revenues						
Expenditures				\$900,000		
Appropriations						

**2 - County, City, School District, and Township Fiscal Effect**

*Identify the fiscal effect on the appropriate political subdivision.*

	2021-2023 Biennium	2023-2025 Biennium	2025-2027 Biennium
Counties			
Cities			
School Districts			
Townships			

**3 - Bill and Fiscal Impact Summary**

*Provide a brief summary of the measure, including description of the provisions having fiscal impact (limited to 300 characters).*

The bill requires schools to teach computer science and cybersecurity courses, and also calls for grants to be available for computer operations and cybersecurity courses for adults.

**4 - Fiscal Impact Sections Detail**

*Identify and provide a brief description of the sections of the measure which have fiscal impact. Include any assumptions and comments relevant to the analysis.*

There are no additional costs from the general fund associated with this bill. ESSER funds will be used to cover the expenses of getting virtual computer science and cybersecurity courses started, as well as providing grants for adult learning, and is listed above as "other expenses" for the 2023-2025 biennium.

## 5 - Revenues Detail

*For information shown under state fiscal effect in 1 or 2, please explain the revenue amounts. Provide detail, when appropriate, for each revenue type and fund affected and any amounts included in the executive budget.*

No revenue in this bill.

## 6 - Expenditures Detail

*For information shown under state fiscal effect in 1 or 2, please explain the expenditure amounts. Provide detail, when appropriate, for each agency, line item, and fund affected and the number of FTE positions affected.*

There are no additional costs from the general fund associated with this bill. \$900,000 worth of ESSER funds are listed in "other funds" for expenditures for the 2023-2025 biennium. \$600,000 worth of those ESSER funds will be used to cover the expenses of getting virtual computer science and cybersecurity courses started. The other \$300,000 worth of these ESSER funds will be used to provide grants for adult learning, as described in Section 4 of the bill.

## 7 - Appropriations Detail

*For information shown under state fiscal effect in 1 or 2, please explain the appropriation amounts. Provide detail, when appropriate, for each agency and fund affected. Explain the relationship between the amounts shown for expenditures and appropriations. Indicate whether the appropriation or a part of the appropriation is included in the executive budget or relates to a continuing appropriation.*

No appropriations in this bill.

## Contact Information

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**Agency:** NDDPI

**Telephone:** 7013282244

**Date Prepared:** 02/15/2023



Testimony in Support  
**House Bill No. 1398**  
House Education Committee  
March 15, 2023

TESTIMONY OF

**Katie Ralston Howe, Director, Workforce Development Division**

Chair Elkin and members of the Senate Education Committee. My name is Katie Ralston Howe, workforce director for the North Dakota Department of Commerce. In my role, I also have the pleasure of serving as the executive director of the industry-led Workforce Development Council. I'm here in support of House Bill 1398.

Lack of available workforce is arguably one of North Dakota's greatest challenges right now. The problem is multifaceted and centered around a lack of people and a mismatch of skills needed to fill our open jobs. Preparing for the workforce starts with our youngest learners and it's important that we give them opportunities to develop the skills they need to be successful when they enter the world of work.

By ensuring all students take computer science and cybersecurity courses throughout their education we will prevent a problem that we're facing today: adult jobseekers and workers who lack foundational digital literacy skills. In November 2021, ND was one of six states accepted to the National Governors Association Workforce Innovation Network, which focused on digital equity infrastructure and skill development for our adult population. We learned that 32% of unemployed adults in our state lack digital skills which is disqualifying them from 72.2% of open jobs right now. What this number doesn't speak to are the number of employed individuals who struggle in their work, because they don't have the basic computer and cybersecurity skills needed to perform daily functions using the technology they have at their fingertips. That's an incredible skill mismatch and one that we need to address. Through our research, we identified that all the jobs on our "in-demand" occupations list require digital skills, and many require intermediate to advanced digital skills. We also found that higher levels of digital skill in occupations in ND are associated with higher incomes. In fact, changing to an occupation that requires higher levels of digital skills can increase annual income by an average of \$660 per year.

Today, nearly every job is an IT job and reliance on technology will increase across all industries. When reviewing North Dakota's most in-demand jobs, it's easy to see how nearly all interact with technology through the devices used, email and the internet, not just in the work that's performed in these jobs, but in the job application process and in the training programs designed to prepare workers in these fields. Having foundational digital skills is already expected in the same way as strong communication skills, ability to work with others, punctuality, and more, and it's important that we equip all North Dakotans for success in the workplace.

I'd like to highlight that the opportunity presented in Section 4 of HB 1398 to provide resources to communities of all sizes to help adult learners, jobseekers, and workers advance their digital skillsets to enhance their participation the labor market is aligned with one of the recommendations included in our NGA report. It also aligns well with requirements under the Digital Equity Act.

By passing HB 1398, we will support the creation of a talent pipeline that has the skills that ND employers need to fill their open jobs, maintain operations, and grow, while ensuring ND workers remain competitive in a global economy. Thank you for the opportunity to share my support for this bill. I am happy to answer your questions.