2019 SENATE EDUCATION COMMITTEE

SB 2171

2019 SENATE STANDING COMMITTEE MINUTES

Education Committee
Sheyenne River Room, State Capitol

SB 2171
1/16/2019
30877

☐ Subcommittee
☐ Conference Committee

Committee Clerk: Lynn Wolf

Explanation or reason for introduction of bill/resolution:

A bill relating to credentials for teachers of computer and cyber science.

Minutes:

Att. # 1 – Superintendent of Public Instruction Baesler; Att. #2 - Doug Remboldt; Att. # 3 - Taya Spelhaug

Chairman Schaible opened the hearing on SB 2171.

Senator Rust, District 2: I am here to introduce SB 2171. This bill gives authority to the superintendent of public instruction to issue credentials to teachers of computer and cyber science. This is the second prong of a three prong approach to bring computer and cyber science instruction to ND elementary and secondary schools. I am introducing the bill at the request of Superintendent of Public Instruction Baesler.

Chairman Schaible: Superintendent of Public Instruction Baesler.

Superintendent of Public Instruction Baesler: See attachment #1.

Chairman Schaible: The money for prong two is in your budget?

Superintendent of Public Instruction Baesler: Yes, it is in my budget.

Senator Davison: Does CTE currently have a credential for computer science?

Superintendent of Public Instruction Baesler: I believe from CTE will be speaking to you later. She will be able to speak to that. The group that we have been meeting did include CTE. They are able to endorse middle and high school teachers for credit courses, they don't provide credentials for the type of courses that would be taught pK-6.

Senator Davison: At some point, you foresee a computer teacher similar to a music teacher in an elementary classroom?

Superintendent of Public Instruction Baesler: Yes.

Chairman Schaible: Other questions. Senator Oban.

Senator Oban: 700 teachers is a pretty lofty goal, what is the timeline for your hope to get that many teachers trained?

Superintendent of Public Instruction Baesler: The first process would be to write administrative rules. The rules would have to be approved by the fall of 2019. Since this is not a mandatory process, you may remember at the time where the legislature required school districts have a library media specialist at their schools – with a certain number at elementary, middle and high school. This is similar, except it is not mandated and with the major exception where library media specialists were required for schools to be approved to be part of that school staff, funding was not provided. That was a large challenge and financial stressor on many of our school districts. We are coming at this a bit differently. We are asking for the funding so the school districts nor the teachers would incur the expenses to get this credential and there is not a mandatory timeline. We will be asking for carryover authority, so the funding we are asking for in our budget is a onetime expense because we are working with the University system teacher preparation, so all new teachers will be able to earn this credential as well. But, to get our existing teachers credentialed, we would expect we would have carryover and hope our school districts would come on board because of the need. The budget request was based on the number of schools and the number of enrollment.

Senator Marcellais: Do you have any idea if we have qualified credentials now?

Superintendent of Public Instruction Baesler: Currently, there is nothing that exists as a computer or cyber client credential. We have not issued any. To the question of how many computer science teachers there are at the high school level, I believe our CTE representative would be able to answer that question as they do that credentialing for computer science teachers.

Chairman Schaible: Other questions. Thank you.

Shawn Riley, CIO for the state of ND: I would like to testify in favor of the bill. As we think of the opportunities for our children in the future, the reality is that, every child regardless of their job – nurse, engineer, farmer, working at Applebees – regardless of their job, technology is critical to their future. When we think of the 21st century workforce, we need our teachers the capability to teach that workforce and what we aer going to be looking at, not only today, but tomorrow. The reality is that technology is this tidal wave that is absolutely changing the world. I would like to have that extra capability to be able carry it on to their students and ultimately the workforce they will become.

Chairman Schaible: Questions. Thank you. Other testimony in favor of.

Tracy Becker, IT Education Supervisor for ND CTE: Today I am testifying in support of SB 2171 to allow the superintendent of public instruction the ability to issue credentials for teachers of computer and cyber sciences with the understanding that relevant training will be provided to those teachers in both computer science and cyber security. There are still

unclear details of whaat the credentialing requirements will look like and what exactly it will cover, but, CTE does intend to work closely with Department of Public Instruction to design quality credentials for ND teachers. Ultimately, with an earlier integration of computer and cyber sciences in our elementary schools taught by the trained credentialed instructors, this will ultimately lead to an increase in enrollment in our more advanced computer science courses at the high school level which will then feed into our post-secondary programs and ultimately in to the workforce to bridge the skills gap that we have in computer and cyber security.

Chairman Schaible: Questions. Thank you.

Deana Wiese, Exec. Director of the Technology Council of ND (#166): We are here in support of the bill today and founding members of the digital workforce coalition that believes in the importance of the of the importance of computer and cyber science at all stages of education. With that, I have Doug Remboldt with National Information Solutions Cooperative in Mandan to provide testimony.

Doug Remboldt, Vice President - Member Support National Information Solutions Cooperative: See attachment #2.

Chairman Schaible: Questions. Thank you. Other testimony in favor of the bill.

Taya Spelhaug, TechSpark Manager - Microsoft: See attachment # 3.

Chairman Schaible: Questions. Thank you. Other testimony in favor of. Agency testimony. Testimony in opposition to the bill. Seeing none, the hearing is closed.

2019 SENATE STANDING COMMITTEE MINUTES

Education Committee
Sheyenne River Room, State Capitol

SB 2171
1/16/2019
30911

☐ Subcommittee
☐ Conference Committee

Committee Clerk: Lynn Wolf

Explanation or reason for introduction of bill/resolution:

A bill relating to credentials for teachers of computer and cyber science.

Minutes:

Chairman Schaible opened the committee work session on SB 2171.

Senator Rust: Mr. Chairman, I move a Do Pass on SB 2171.

Vice-Chairman Fors: Second.

Chairman Schaible: Is there discussion.

Vice-Chairman Fors: Is this in the govenor's budget?

Chairman Schaible: It is in DPIs budget and we don't need to worry about the money. Other discussion. There is a motion for Do Pass on SB 2171.

Roll was taken.

Motion Carries. 7 yeas, 0 nays, 0 absent.

Date: 1-16-19
Roll Call Vote #: #1

2019 SENATE STANDING COMMITTEE
ROLL CALL VOTES
BILL/RESOLUTION NO. SB 2171

Senate Education Committee

☐ Subcommittee

Amendment LC# or Description: _____

Recommendation: ☐ Adopt Amendment
☑ Do Pass ☐ Do Not Pass ☐ Without Committee Recommendation
☐ As Amended ☐ Rerefer to Appropriations
☐ Place on Consent Calendar

Other Actions: ☐ Reconsider ☐ _____

Motion Made By Sen. Rust Seconded By Sen. Fors

Senators	Yes	No	Senators	Yes	No
Chairman Schaible:	✓		Senator Marcellais:	✓	
Vice-Chairman Fors:	✓		Senator Oban:	✓	
Senator Davison	✓				
Senator Elkin:	✓				
Senator Rust:	✓				

Total (Yes) 7 No 0

Absent 0

Floor Assignment Sen. Rust

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE

SB 2171: Education Committee (Sen. Schaible, Chairman) recommends **DO PASS** (7 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). SB 2171 was placed on the Eleventh order on the calendar.

2019 HOUSE EDUCATION

SB 2171

2019 HOUSE STANDING COMMITTEE MINUTES

Education Committee
Coteau A Room, State Capitol

SB 2171
3/5/2019
33207

☐ Subcommittee
☐ Conference Committee

Committee Clerk: Bev Monroe

Explanation or reason for introduction of bill/resolution:
A bill relating to credentials for teachers of computer and cyber science

Minutes: Attachment 1, 2, 3, 4

Vice Chairman Cynthia Schreiber-Beck: Opened the hearing on SB 2171.

Sen. David Rust: This bill gives authority to the Superintendent of Public Instruction to issue credentials to teachers of computer and cyber science. This is the second prong of what started out as a three prong approach to bring computer and cyber science instruction into North Dakota elementary and secondary schools. I'm introducing this bill at the request of DPI, and Superintendent Baesler will tell you everything you need to know about this bill.

Kirsten Baesler, State Superintendent, DPI: (Attachment 1) The information in the packets I am handing out has multiple information in it. It has statistics on students' enthusiasm for this type of learning. The third packet of papers within this folder has a memo attached and what I have outlined in detail. DPI and those who worked on this group are ESPB, CTE, EduTech, NDUS, Governor's Office, legislators, ND Chamber and industry representation. end 11:55

Vice Chairman Cynthia Schreiber-Beck: Any further questions?

Rep. Longmuir: In your testimony you are talking about the second prong as an appropriation that has been requested. There is no fiscal note with this particular bill. What is the status of your appropriation request?

Kirsten Baesler: The status of my appropriation request is it was included in the Governor's recommended budget. We visited with the House ENE; our hearing was held yesterday. I followed up on the conversations with the majority of the appropriations committee. They are looking at this very favorably. I shared the funding mechanism with Majority Leader Pollert yesterday. What the funding mechanism is, is even though we get fairly close to our projections of how much we need for state foundation aid because of the large number we are dealing with (even if we get within one percent of student enrollment projections) that has caused $12.5M turn back to our budget. Of that $12.5M, 3% to 3.5% of that will be necessary

to cover our special education contracts and over contracts. That leaves approximately $9M of turn back that has not been earmarked. We are asking that $3M of that turn back be a one-time targeted use for this. The reason it wouldn't be an ongoing expense is because our teachers are getting this preparation in their teacher preparation programs. That funding would allow us to pay for the training for our teachers to receive.

Around the 2005-2007 session, the Legislature required that library media specialists be included. It was mandated that a library media specialist serve every elementary, middle and high school according to the number of their students. It was an unfunded mandate; they left that up to the school districts. As a former library media specialist, it was proposed to us as educators that if you wanted a job the next year, they needed someone who had those credentials. Often times without the funding and support, it is put on the shoulders of our teachers to get those credentials. We wanted to make sure that it was equitable that not just those that may have higher enrollment and had more money to play with would not draw teachers away from a school district that didn't have it in their budget. A potential computer science teacher working at this district would be recruited away from that district and they wouldn't have to pay for their own education.

This bill does not have a fiscal note. Without the funding, the growth will grow slower but we would need the authority to add the credentials however; especially for those future teachers as well that are already graduating from our teacher preparation programs for these trainings. end 15:15

Rep. Mary Johnson: You don't change a curriculum to include computer science teachers; this is a mechanism by which existing teachers of varying subjects can improve learning?

Kirsten Baesler: Yes.

Vice Chairman Cynthia Schreiber-Beck: Any questions from the committee?

Rep. Hoverson: Did you say that 700 of this type of job is already available in North Dakota?

Kirsten Baesler: Yes. Computer science, systems analysts, etc.

Vice Chairman Cynthia Schreiber-Beck: Do you think that distance education will get this out to our students and our teachers?

Kirsten Baesler: Yes, a lot of this is already occurring.

Vice Chairman Cynthia Schreiber-Beck: Any questions from the committee? Others in support?

Deana Wiese, Executive Director, TechND: **(Attachment 2)** This is just one piece in the three-prong approach to allow for computer and cyber science to be further integrated into K-12 curriculum and we strongly encourage your favorable consideration.

Vice Chairman Cynthia Schreiber-Beck: Any questions? Further support of SB 2171?

Rosi Kloberdanz, Director, ND Educational Technology Council/Director, EduTech: Computers are central to the medical field, scientific research and exploration, finance, education, information storage and retrieval, communication, computer graphics and animation, networking and web access and the list goes on. Our homes also are included in this category with all the devices we have at our disposal.

Last fall, DPI began working with the North Dakota community on computer and cyber science standards in an innovative, first in the nation, effort to integrate cyber security within computer science. The two are interrelated. Computer science is foundational and cyber security insures that all of our ND students and citizens will be prepared to live in an increasingly digital and technology driven society. Senate Bill 2171 directly addresses this need relating to credentials for teachers of computer and cyber science. If we intend to increase our workforce, we will need to internally and organically grow our own from kindergarten on up. Our K-12 student need to have the opportunity to build strong computer science and cyber security backgrounds to fill this need.

Vice Chairman Cynthia Schreiber-Beck: Any questions? More in support?

Maggie Glennon, Director of State Government Affairs, Code.org: (Attachment 3)

Vice Chairman Cynthia Schreiber-Beck: Any questions? Others in support?

Rudie Martinson, ND Hospitality Association: **(Attachment 4)**

Vice Chairman Cynthia Schreiber-Beck: Any questions? Continue in support of SB 2171. Anyone in opposition? Neutral testimony? Seeing none, we will close the hearing.

2019 HOUSE STANDING COMMITTEE MINUTES

Education Committee
Coteau A Room, State Capitol

SB 2171
3/6/2019
33356

☐ Subcommittee
☐ Conference Committee

Committee Clerk: Bev Monroe

Explanation or reason for introduction of bill/resolution:
A bill relating to credentials for teachers of computer and cyber science

Minutes:

Chairman Owens: Starting committee work with SB 2171.

Representative Denton Zubke: I'll move a **Do Pass** on SB 2171.

Vice Chairman Cynthia Schreiber-Beck: I'll **second** the motion.

A Roll Call Vote was taken**:** **Yes 12, No 0, Absent 2.** A **Do Pass** carries**.** Rep. Guggisberg will carry SB 2171.

Date: 3-6-19
Roll Call Vote #: 1

2019 HOUSE STANDING COMMITTEE
ROLL CALL VOTES
BILL/RESOLUTION NO. SB 2171

House Education Committee

☐ Subcommittee

Amendment LC# or Description: _____

Recommendation: ☐ Adopt Amendment
☒ Do Pass ☐ Do Not Pass ☐ Without Committee Recommendation
☐ As Amended ☐ Rerefer to Appropriations
☐ Place on Consent Calendar

Other Actions: ☐ Reconsider ☐ _____

Motion Made By Rep. Zubke Seconded By Rep. Schreiber-Beck

Representatives	Yes	No	Representatives	Yes	No
Chairman M. Owens	✓		Rep. Guggisberg	✓	
V. Chair. Schreiber-Beck	✓		Rep. Hager	✓	
Rep. Heinert	✓				
Rep. Hoverson	A				
Rep. D. Johnson	✓				
Rep. M. Johnson	A				
Rep. Johnston	✓				
Rep. Longmuir	✓				
Rep. Marschall	✓				
Rep. Pyle	✓				
Rep. Strinden	✓				
Rep. Zubke	✓				

Total (Yes) 12 No 0

Absent 2

Floor Assignment Rep. R. Guggisberg

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE

SB 2171: Education Committee (Rep. Owens, Chairman) recommends **DO PASS** (12 YEAS, 0 NAYS, 2 ABSENT AND NOT VOTING). SB 2171 was placed on the Fourteenth order on the calendar.

2019 TESTIMONY

SB 2171

SB 2171
1-16-19
Att. #1
P1 of 4

TESTIMONY ON SB 2171
SENATE EDUCATION COMMITTEE
Wednesday, January 16, 2019
By: Kirsten Baesler, Superintendent of Public Instruction
701-328-4570
North Dakota Department of Public Instruction

Chairman Schaible and members of the committee, my name is Kirsten Baesler. I am the State Superintendent of the North Dakota Department of Public Instruction. I am here to speak in favor of Senate Bill 2171 and ask that you give a do pass recommendation to this bill. Senate Bill 2171 would create a new credential for teachers to add to their teaching license.

DPI has recognized the growing need to implement computer science and cyber education within our schools. A 2016 Gallup Poll showed that 91% of parents want students to learn computer science and believe learning code is as important as learning reading and math. This is now considered foundational knowledge in K-12 education. To fully obtain 21st century skills and knowledge, today's students should have a basic understanding of how to use and test an algorithm, how the internet works, how to create an app, and how to develop computational thinking. It is this computational thinking which allows students to look at problems differently, and to develop problem-solving skills that can be applied to any field, for any problem.

By providing the Department of Public Instruction with the authority to issue credentials to a teacher for computer and cyber science after they have completed additional coursework and training, the Legislature would be positively contributing to a three-pronged statewide computer science and cyber vision.

Since December of 2017, DPI has been collaborating with numerous partners and agencies in developing a comprehensive plan to address computer science and cyber education expansion across our state.

The first prong of our plan is to have new classroom learning standards for computer and cyber education. A team of 18 North Dakota educators started this work last year. Just yesterday, the group finished the final draft of these standards. They will soon submit these standards to me for approval and adoption. These standards will be ready for teachers to use in the 2019-20 school year. We will be the first state in the nation to have a comprehensive PK-12 set of computer and cyber standards for our classrooms.

The second prong is an appropriation that has been requested in our budget to provide teacher training. This request was included in the Governor's recommendations. Our goal is to train 700 teachers for the computer science and cyber credential. This funding would ensure at least one teacher will be trained/qualified in every school with under 300 students enrolled; at least two

teachers trained/qualified in every school with enrollment between 300 and 700 and; at least three teachers trained/qualified in every school with enrollment over 700.

The third prong is what Senate Bill 2171 represents. Its goal is to have a professional teaching credential for computer and cyber science. It is important for our North Dakota students, parents, and schools to have proper training for our educators to convey our new learning standards. Credentialing will allow greater opportunities and flexibility for districts as they look for ways to integrate computer science and cyber standards and classes in their schools.

According to Code-dot-org, a nonprofit organization, fewer than one-quarter of North Dakota's public high schools now teach computer science. That has to change.

Let me emphasize that computer science education is critical for the development of our North Dakota workforce. Computer science skills are valuable in the job market and they help encourage innovation in our economy.

The North Dakota Workforce Education Advisory Council says computer systems analysts, software developers, and systems managers are high demand occupations in North Dakota right now. That will continue to be true in the future.

The Bureau of Labor Statistics has projected close to 40 percent growth in the computer systems design and services industry.

North Dakota has more than 700 computing jobs open with an average salary of more than $70,000 dollars.

Creating a computer and cyber science teaching credential increases our capacity to teach our students about this important subject.

It gives our educators a professional skill that is useful in their own workplace.

It helps to develop and strengthen our North Dakota work force and prepare our students for a work that will be in their future.

Chairman Schaible and members of the committee, I respectfully request a do pass recommendation for Senate Bill 2171.

I welcome any questions you may have.

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SB 2171
1-16-19
Att #2
Pg 1 of 2

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www.technd.org

Testimony of Doug Remboldt
Vice President – Member Support
National Information Solutions Cooperative

In Support of SB 2171
January 16, 2018

Chairman Schaible and Members of the Senate Education Committee:

My name is Doug Remboldt, and I am the vice president of member support National Information Solutions Cooperative (NISC) in Mandan. I also serve as the public policy committee chairman of the Technology Council of North Dakota (TechND). It is on behalf of TechND that I am voicing support of SB 2171, which allows the Superintendent of Public Instruction to credential computer and cyber science teachers.

TechND, formerly known as the Information Technology Council of North Dakota (ITCND), was created in 2000 by North Dakota business, government and education leaders who recognized the need to strengthen the state's information technology infrastructure and reposition the state as a national leader in IT. The organization has since expanded its focus to include members from the technology industry as a whole. TechND has nearly 70 member organizations, with representatives from both the public and private sector. TechND is also a founding member of the Digital Workforce Coalition. This newly formed coalition is made up of organizations, companies, and trade associations who recognize that base computer science skills are necessary to the future workforce of our state

North Dakota's economy is strong, and the state's technology industry is no exception. North Dakota has seen an increase of more than 27 percent in technology occupations over the past decade and is projecting a 20 percent increase for the next 10 years. This growth equates to more than 6,500 new and replacement technology positions over the next decade. These jobs aren't only in the technology industry – computer and cyber science skills are vital to virtually every industry across the state, including energy, agriculture, healthcare, finance and manufacturing. A shortage of skilled technology workforce continues to be a challenge for all of these industries, many times hindering economic growth because positions cannot be filled, leaving

organizations without the resources to grow in our state. Therefore, the development of a high-quality workforce is vital to the future growth of North Dakota's.

TechND strongly supports the Department of Public Instruction's (DPI) efforts to expand the delivery of computer and cyber science education throughout North Dakota and this bill provides an important piece of the puzzle in properly preparing teachers. This is an opportunity for our state's educational system to lead the nation as we move forward into a more technical workforce. Allowing the Superintendent of Public Instruction the ability to credential computer and cyber science teachers will be critical as we move forward aggressively and quickly to equip all our students with nation-leading technical education.

We ask for your favorable consideration of SB 2171.

SB 2171
1-16-19
Att #3
p1 of 2

Testimony of Taya Spelhaug

TechSpark Manager- North Dakota, Microsoft

Testimony in Support of SB 2171
January 15, 2019

Chairman Schaible and Members of the Senate Education Committee,

My name is Taya Spelhaug and I am the Manager of the TechSpark program for Microsoft in North Dakota. Microsoft has had a long-standing presence in North Dakota going back decades, with over 1,200 employees at our Fargo campus. The Microsoft TechSpark initiative is a civic program aimed at fostering greater economic opportunity and job creation. As a North Dakota native and a graduate of NDSU, I am proud that North Dakota was selected as one of six states for the TechSpark program.

It is in that spirit that I join you today as a member of the Digital Workforce Coalition to testify in support of the Department of Public Instruction's (DPI) Computer and Cyber Science standards. We strongly support these standards and the authority requested by the Department to enable them to credential new teachers in this area and ensure that every North Dakota student, in every school, is equipped with the base computer science skills to compete and thrive in today's digital economy.

In a world where virtually every industry is being impacted by technology, this knowledge is as foundational as reading, writing, and math. Ensuring that every child in North Dakota has access to quality computer science 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.

The expansion of K-12 computer science programs is often hampered by the lack of qualified computer science teachers. For example, Universities in North Dakota did not graduate a single new teacher prepared to teach computer science in 2016. By expanding teacher credentialing authority for DPI, we can grow their ranks and increase access, enabling more schools to offer and teach computer and cyber science courses at all grade levels.

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 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. Today TEALS operates in 29 states, 350 high schools, and reaches 11,000 students. In North Dakota we have 15 schools teaching computer science through the TEALS program.

To close, I want to thank Superintendent Baesler, her staff at the Department of Public Instruction, and all those who served on the committee to develop the new standards for their excellent work. As a member of the review committee, it was inspiring to see the passion these educators have for bringing equitable access to computer science to their students. These first-in-the-nation Computer and Cyber Science Standards will put North Dakota students on a path for success in the high-skilled, technology-dependent jobs of the future. To implement these standards however, we will need your help to prepare our teachers and school districts to implement them. I hope you will join me in supporting this bill and the Department's request.

Thank you.

SB 2171
3-5-19
#1

TESTIMONY ON SB 2171
HOUSE EDUCATION COMMITTEE
Tuesday, March 5, 2019
By: Kirsten Baesler, Superintendent of Public Instruction
701-328-4570
North Dakota Department of Public Instruction

Chairman Owens and members of the committee, my name is Kirsten Baesler, Superintendent of the North Dakota Department of Public Instruction. I am here to speak in favor of Senate Bill 2171 and ask that you give a do pass recommendation to this bill. Senate Bill 2171 would create a new credential for teachers to add to their teaching license.

DPI has recognized the growing need to implement computer science and cyber education within our schools. A 2016 Gallup Poll showed that 93% of North Dakota parents want students to learn computer science and believe learning to code is as important as learning reading and math. This is now considered foundational knowledge in K-12 education. To fully obtain 21st century skills and knowledge, today's students should have a basic understanding of how to use and test an algorithm, how the internet works, how to create an app, and how to develop computational thinking. It is this computational thinking which allows students to look at problems differently, and to develop problem-solving skills that can be applied to any field, for any problem.

By providing the Department of Public Instruction with the authority to issue credentials to a teacher for computer and cyber science after they have completed additional coursework and training, the Legislature would be positively contributing to a three-pronged statewide computer science and cyber vision.

Since December of 2017, DPI has been collaborating with numerous partners and agencies in developing a comprehensive plan to address computer science and cyber education expansion across our state.

The first prong of our plan is to have new classroom learning standards for computer and cyber education. A team of 18 North Dakota educators started this work last year. Just last month, the group finished the final draft of these standards. They will soon submit these standards to me for approval and adoption. These standards will be ready for teachers to use in the 2019-20 school year. We will be the first state in the nation to have a comprehensive PK-12 set of computer and cyber standards for our classrooms.

The second prong is an appropriation that has been requested in our budget to provide teacher training. This request was included in the Governor's recommendations. Our goal is to train 700 teachers for the computer science and/or cyber credential. This funding would ensure at least one teacher will be trained/qualified in every school with under 300 students enrolled; at least two

teachers trained/qualified in every school with enrollment between 300 and 700 and; at least three teachers trained/qualified in every school with enrollment over 700.

The third prong is what Senate Bill 2171 represents. Its goal is to have a professional teaching credential for computer and cyber science. It is important for our North Dakota students, parents, and schools to have proper training for our educators to convey our new learning standards. Credentialing will allow greater opportunities and flexibility for districts as they look for ways to integrate computer science and cyber standards and classes in their schools.

I will not go into further detail on this item but will provide you with this packet that provides more details of the plan and ND statistics that demonstrate the demand. Future teachers will have the opportunity to graduate with the necessary training from their teacher preparation programs and North Dakota should be prepared to offer them a credential to add to their teaching license.

According to Code-dot-org, a nonprofit organization, fewer than one-quarter of North Dakota's public high schools now teach computer science. That must change. What is even more important to note about this effort is that we are not only targeting an increase in our high schools, but we are recognizing that this learning must be offered to our elementary and middle school students as well.

SB 2171
3-5-19
#1

Let me emphasize that computer science education is critical for the development of our North Dakota workforce. Computer science skills are valuable in the job market and they help encourage innovation in our economy.

The North Dakota Workforce Education Advisory Council says computer systems analysts, software developers, and systems managers are high demand occupations in North Dakota right now. That will continue to be true in the future.

The Bureau of Labor Statistics has projected close to 40 percent growth in the computer systems design and services industry.

North Dakota has more than 700 computing jobs open with an average salary of more than $70,000 dollars.

Creating a computer and cyber science teaching credential increases our capacity to teach our students about this important subject.

It gives our educators a professional skill that is useful in their own workplace.

It helps to develop and strengthen our North Dakota work force and prepare our students for a work that will be in their future.

Chairman Owens and members of the committee, I respectfully request a do pass recommendation for Senate Bill 2171.

I welcome any questions you may have.

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SB 2171
3-5-19
#1

INFORUM
Powered by The Forum and WDAY

Parents say kids need to learn computer science, cybersecurity at a younger age

Written By
Barry Amundson

North Dakota Superintendent of Public Instruction Kirsten Baesler, shown in this file photo, says bills have been approved in the state Senate that would aid the Department of Public Instruction in delivering a program to North Dakota school districts that would provide coding and cybersecurity instruction to students in elementary school. Forum file photo

BISMARCK — Parents have been asking schools to teach younger North Dakota students more computer and cyber science including coding and even cybersecurity.

After all, the jobs are certainly there with more than 350,000 openings nationwide in cybersecurity, for example, and only a handful going into the field, according to statistics provided to the state.

Superintendent of Public Instruction Kirsten Baesler said a majority of parents in North Dakota "believe that (computer) coding and understanding of all of the apps and devices we are using are as important to students as reading, writing and mathematics."

"It's truly about preparing students not for just jobs, but also preparing them for life," Baesler said about a new state effort to improve computer science instruction in all of

the state schools from elementary to high school in the ever-changing world of the Internet and living with apps.

Although computer science is offered in many high schools, Baesler said "parents of elementary-age students are telling us loud and clear that it's too late when they are freshmen. They need to have a basic understanding of computer science in our elementary schools."

She agreed it was a big step. "We are here to serve students, but also to serve the parents of our students," Baesler said.

Bills have been approved in the state Senate that would aid the Department of Public Instruction in delivering a blueprint for advancing the program, and those bills are now headed to the House.

Baesler said, in a way, the state would be the first in the nation in how it would deliver computer science instruction to all 101,000 students in the state's 244 districts.

The department has a three-prong approach to reach that goal, which sets it apart from other states. The plan is to create standards for each grade in computer science, train one teacher for every 160 students in school districts across the state and obtain state funding for training that will allow the teachers to gain credentials.

The bill that passed the Senate unanimously would allow the state to add a computer science credential to teachers' licenses so they can offer instruction in elementary and middle schools. Some certified computer science instructors currently teach in various districts at the high school level.

However, the department didn't want to leave local districts with the bill for training teachers, Baesler said. So the department has requested $6 million in one-time funding for training, while Gov. Doug Burgum's budget called for $3 million. The Senate, she said, didn't allocate the funding in its recommendation so she said the House will "hear our case and determine if they will include any dollars."

She said the funds are there as carryover money is available from the last two-year budget.

SB 2171
3-5-19
#1

Baesler added that more money is not needed in future years because the amount would be enough to train all teachers necessary to cover students in all school buildings across the state.

"It is our hope that future teachers would receive the training in their teacher preparation programs at their colleges and universities," she said.

Under the proposed new training program, current teachers would have multiple pathways to gain credentials. Baesler said programs offered by Microsoft and Code.org train teachers how to help students learn coding, as well as other programs offered by the federal Homeland Security department and STEM.org.

Baesler said in developing the training program, she has also been working with Bismarck State College President Larry Skogen, who just recently signed an agreement to partner with Palo Alto Networks of San Jose, Calif., to begin a regional academy this fall at the college to train K-12 teachers, BSC students and the public in cybersecurity.

North Dakota's effort, in a move that sets it apart and is certainly a first in the nation, involves offering instruction to all students in cybersecurity and network security, along with other computer science knowledge, Baesler said. That means students would gain general knowledge about keeping technological networks safe.

Baesler also pointed out that it's not only parents and technology companies looking for improved computer science instruction, but other industries such as agriculture and hospitality. At a Senate bill hearing this winter, she said representatives were promoting the bills from the state soybean council and hospitality association.

In Fargo, Superintendent Rupak Gandhi said they are looking forward to the additional support from the state because they already started a program to teach coding as elementary library media specialists have been trained using the Code.org program.

He said by the end of next school year, coding will be taught to all students in kindergarten through eighth grade in Fargo.

As the K-12 program intensifies in Fargo and statewide, there will also be an opportunity for students to stay in North Dakota for an even more in-depth program as the Bismarck college, besides working on its new Palo Alto partnership, plans this fall to expand its cybersecurity program, according to Skogen.

He said the college has been training technicians in a two-year program in cybersecurity and networking for about three years and this fall will expand that effort by also offering a four-year bachelor's degree program in the field.

He said approximately 78 students are currently enrolled in the program, but he expects to have a national footprint in the coming years as applications are coming in from all over the nation. He said the effort started as an extension of its energy-related programs at the college.

Other North Dakota higher education facilities at Minot, Fargo and Grand Forks also offer course work in cybersecurity, however, those are of varying types.

He agreed with Baesler that the effort to offer students more instruction in a field that already has plentiful job opportunities and will have more in the future is the right move. In addition to the current 350,000 job openings in cybersecurity in the U.S, he has statistics that show there are more than 2 million job openings this year worldwide and that the shortage of workers in that field alone will reach 3.5 million by 2021, according to Cybersecurity Ventures.

North Dakota participating in national cybersecurity competition

BISMARCK — Gov. Doug Burgum has announced the state's participation in an online cybersecurity competition.

The 2019 Girls Go CyberStart program is a series of online challenges that allow students to act as cyber protection agents to solve cybersecurity-related puzzles and explore related topics such as cryptography and digital forensics.

No experience is required to enter the free program for girls in grades 9-12.

SB 2171
3-5-19
#1

Students will have chances to win cash prizes and scholarships for themselves and their schools.

Both men and women in college can also play CyberStart this year in a program called Cyber FastTrack to compete for $2.5 million in scholarships for advance cybersecurity education as well as internships and jobs in the field.

Girls can register for the high school program until March 20 at girlsgocyberstart.com, while college students can go to cyber-fasttrack.org.

SB 2171
3-5-19
#1

Roscoe Streyle: North Dakota Won't Be the Best Place for Education if We Don't Make the Investments

- Featured

- This And That

February 25, 2019 | by Rob Port

Mary Stark Elementary School second-grade student Chase Gumeringer uses an iPad with his classmates in teacher Tammy Bopp's room in Mandan in 2016. (MIKE MCCLEARY, BISMARCK TRIBUNE)

This guest post was submitted by Minot resident Roscoe Streyle who served in the state House from 2011 to 2018.

SB 2171
3-5-19
#1

What are the Governor, Legislature, ND University System (NDUS) or the Department of Public Instruction (DPI) doing to improve the educational delivery system, content, educational opportunities and the learning experience for North Dakota students? What are they doing to transform their systems into a nimbler 21st century educational system? These questions aren't easy to answer, but I will try and explain a few key pieces of legislation that have been passed and some that must be passed this session.

In the 17-19 session a key piece of legislation SB2186, the "Innovation Education Bill", prime-sponsored by the highly respected Sen. Nicole Poolman was passed. This allows more flexibility for K-12 schools to adopt innovative learning techniques to educate their students in different ways that haven't been done in the past. The bill essentially allowed for the creation of dozens of innovation and alternative educational "think tanks". What a great concept! Allow our schools to do what works best for them to deliver a world-class education. Superintendent Baesler said, "it is one of the most important education bills to be introduced this session for our students' futures". I agree and the same quote could be applied to her Computer and Cyber Sciences (CCS) proposals I will try and explain next.

I want North Dakota to be the best place in America to learn, both in K-12 and Higher Education, but we won't be the best if we don't make the investments.

The Governor, DPI, NDUS and the Legislature now need to take it a step further. Governor Burgum and Superintendent Kirsten Baesler took the first step and included proposals in the budget request. The Governor, DPI and the Legislature now need to work together and implement the innovative proposals to make computer science and cybersecurity curriculum available in ALL North Dakota schools. The goal is for students to receive at least one CCS education course during elementary, middle and high school. The ultimate goal is to create a K-12 educational environment where CCS is considered foundational education for all students. Many parents, want our children to have a well-rounded education and CCS must be part of their educational experience. In fact, a recent Gallup poll indicates over 90% of parents want their child to learn more computer science. Further, 93% of parents see computer science education as a good use of resources at their child's school.

These goals are well researched, well thought out, and importantly have been developed as part of a collaborative effort between DPI, ESPB (Educational Standards and Practices Board), CTE (Career Tech Education), NDUS, Governor's Office, Parents, Private Industry, and Legislators. The plan includes: creating North Dakota's first set of CCS standards, developing teacher credentialing for licensure, providing instructional options for local schools to utilize, training at least one teacher for every 160 students at every school in the State, and providing the funding to cover the cost of training for school districts and

teachers. DPI has developed many partnerships to create a menu of options for schools and teachers to choose from that fits their individual school. The proposals put forward also do not mandate anything, nor do they mandate on how to implement the CCS standards. DPI will simply make the resources available to all schools and the training available.

The CODE.org training is a prime world-wide influencer in CCS education and, thanks to temporary grants, is currently largely free to participating schools. Available courses focus on computer programming ("coding"), computer sciences, cybersecurity education, and many other areas. The educational system must adjust to the marketplace and to where the jobs of in the 21st century exist. Our children won't all go into these careers of course, but providing them the opportunity to learn and understand the basics will provide our youth with a better understanding of the digital world we all live in – whether they choose a career in CCS industries or not. Just like we aren't doing enough in Higher Education to produce more technical and trade school training opportunities and graduates, we are not doing enough in K-12 for the CCS fields.

It does take money to train the teachers and implement the flexible curriculum, which could be funded with carryover dollars (no new funds). This investment is badly needed if we want our children to have the best educational opportunities in the country. I want North Dakota to be the best place in America to learn, both in K-12 and Higher Education, but we won't be the best if we don't make the investments. This is one of those investments that we can't wait on, we are already behind the curve a bit, but could easily catch up by moving now on these proposals.

It's my hope at the end of this Legislative session these proposals will be adopted, funded to the appropriate level and every school by 2022 will have CCS trained teachers and instructional choices available. Take the time to visit and learn about what CODE.org, Microsoft TEALS, Cisco, NICERC, Project Lead the Way, or any of the other organizations are doing. All of these organizations badly want a more educated America, let's take them up on their offers to help deliver more educational opportunities for our children.

SB 2171
3-5-19
#1

Attached is a one-pager describing our goals with computer science and cybersecurity (CCS) as developed by a team involving:

- DPI
- ESPB
- CTE
- EduTech
- ND University System
- Governor's Office
- Legislators
- ND Chamber and Industry representation.

I will draw your attention to several key items you will see on the document:

- There is **nothing** mandated of schools; however, we note both the importance of CCS as well as the desire of parents to have CCS offered in schools K-12, and our hope is schools will understand the importance and will choose to implement accordingly.

- There is no prescribed method to implement the standards – we anticipate many will integrate it within existing classes. Side note, to help accommodate, we have been working with NICERC who plans to write integrated lessons and curriculum specific to ND's new standards, just for ND teachers. Again, this is not required, but made available as a resource.

- We will not require one prescribed or mandated program for training. School districts will choose the best method for their schools. The goal is to train existing teachers in every school, K-12 (about 1 teacher for every 160 students). ND has developed multiple partnerships to create a menu of options for schools and teachers to choose from.

- The intent is for the funding to cover all costs so there is little to no financial lift of the districts. We want to remove as many barriers as possible. These funds are made available from carryover dollars from the current biennium and would be one-time funding only with no additional impact on the foundation aid funding.

- I will stress the importance of these funds as without them, we can anticipate a much smaller percentage of schools and teachers who will actually implement CS in their classrooms.

SB 2171
3-5-19
#1

NDDPI CCS GOALS AND FOCUS

Goal:

- Every school offer CCS education (NOT MANDATED by state)
    - Desire every student receive CCS education at least once in every school (elementary, middle, and high school)
    - Ultimately, the goal is to create the K-12 educational setting in which CCS becomes foundational knowledge for all students.
    - NOTE: parents desire CS to be taught

Three Prong Approach to Reach Goal:

1.) Standards
- Work to develop the CSTA during the 18-19 school year.
    a. Began September 2018; expected completion by early (February) 2019
- Implement by the 2019-2020 school year.

2.) Teacher Pipeline Goals
- Secure CCS Credentialing Authority for ND State Superintendent during 2019 Legislative Assembly (SB 2171)
    - Will allow unencumbered abilities for schools to offer and teach CCS courses in all grades and content disciplines and programs.
    - This expands existing (limited) credentialing currently available through CTE
    - Credentialing timeline will be available fall of 2020

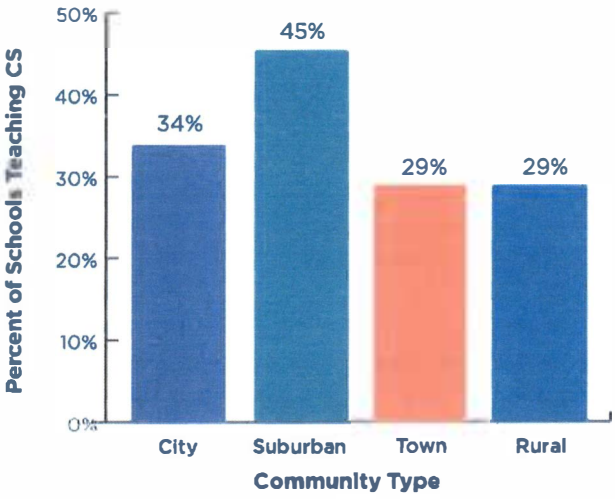
3.) Appropriations and Funding Goals
- Secure funding to provide teacher training focused on one teacher trained for (approximately) every 160 students statewide (ratio dependent upon school size) for a total of 700 in-service teachers statewide:
    - At least 1 teacher trained/qualified in every school under 300 students enrolled
    - At least 2 teachers trained/qualified in every school with enrollment of 300-500
    - At least 3 teachers trained/qualified in every school over 500 enrollment
- Training will lead to credentials
- Desire minimal financial responsibility of the districts (funding to also cover ancillary costs such as sub pay, travel, lodging, and supplies)
- One-time funding for biennium sourced from '17-'19 biennium carryover dollars (no new dollars from General Fund – no effect on foundation aid).
- Teacher prep programs will begin integrating CCS training for pre-service teachers

NOTE: Implementation of the standards, as well as the teacher training, are designed with a local control approach. Schools and districts are encouraged to determine the best fit possible – whether stand alone classes or integrated within existing courses. Teachers from any content area are eligible for training. This is designed to create an à la carte approach with supports for schools to implement accordingly.

SB 2171
3-5-19
#1

Percent of High Schools Teaching Computer Science by Community Type

Students in rural communities have less access to computer science.



Computer science is one of the few policy issues that can address both foundational education needs and workforce development demands for a state's future workforce. Numerous states have begun to pursue nine specific policy ideas to expand access to K-12 computer science for all students.

Nine Policies to Make Computer Science Fundamental

1. **Create a state plan** for K-12 computer science
2. **Define computer science** and establish rigorous K-12 computer science standards
3. **Allocate funding** for rigorous computer science teacher professional learning and course support
4. **Implement clear certification pathways** for computer science teachers
5. **Create programs** at institutions of higher education to offer computer science to preservice teachers
6. **Establish dedicated computer science positions** in State and Local Education Agencies
7. **Require that all secondary schools offer computer science** with appropriate implementation timelines
8. **Allow computer science to satisfy** a core graduation requirement
9. **Allow computer science to satisfy** an admission requirement at institutions of higher education

Policy Principles

- Clarity
- Capacity
- Leadership
- Sustainability

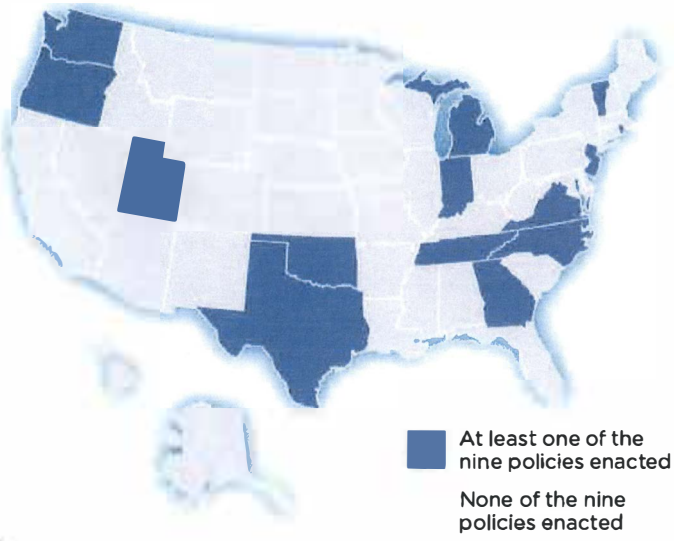
The principle Equity and Diversity is incorporated in each of the nine policies.

15

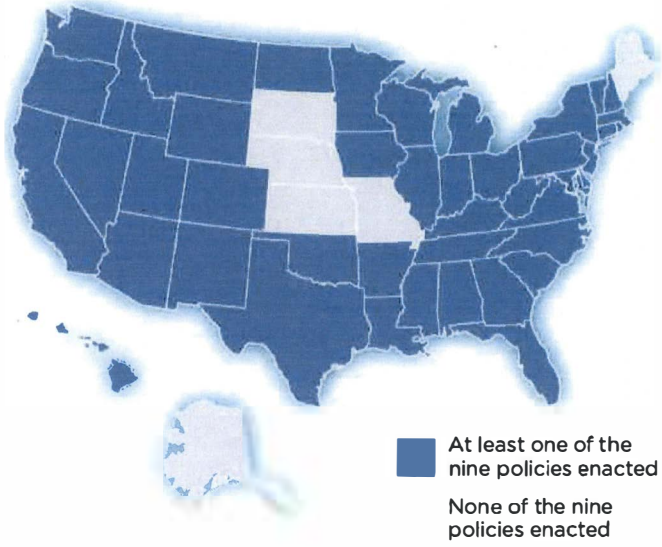
SB 2171
3-5-19
#1

When the Code.org Advocacy Coalition began its work in 2013, just 14 states plus Washington, D.C. had at least one of these nine policies in place. Because of bipartisan support from state and national leaders over the last five years, 44 states have enacted one or more of these policies. The pace of reform is accelerating; since the last state of computer science report in 2017, 33 states have passed new laws and regulations promoting computer science.

2013: States with at least one policy

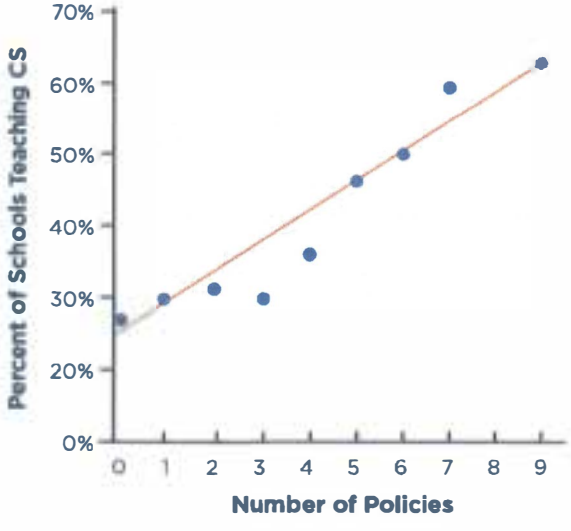


2018: States with at least one policy



Trend in Policy Adoption and Access to Computer Science

States that have adopted more of the nine policies have a greater percentage of high schools teaching computer science.



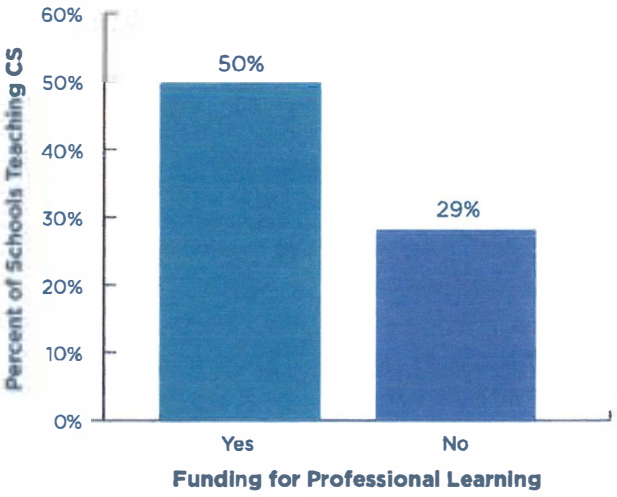
But do these policies mean that more students have access to K-12 computer science? This report analyzes implementation rates in states that have pursued these policies. The graph to the left clearly shows that in states that enact more of these nine policies, a greater percentage of schools provide students access to K-12 computer science.

SB 2171
3-5-19
#1

State funding for K-12 computer science professional learning is a key policy for expanding access. By focusing funding on high-quality professional learning to retrain part of the existing teaching workforce (rather than hiring new computer science teachers) states can keep costs low while quickly scaling. New data from this report shows that this approach is working. States that have funded K-12 computer science opportunities have 1.7 times the implementation rates of states that have not provided direct funding.

Funding and Access to Computer Science

States that have provided funding for teacher professional learning in computer science have more high schools that teach computer science.



States should enact or expand on all nine of these education policies in order to provide opportunities for all students regardless of where they live, their race/ethnicity, gender, or socioeconomic status. States that have enacted some or many of these ideas should continue to focus on implementation. They should continue to fund opportunities to prepare inservice teachers so students can have access in the short term, while funding preservice teacher preparation to sustain the growth of the teaching workforce in the long term.

We cannot let generations of students—particularly those from underrepresented backgrounds—leave the K-12 system without some exposure to computer science. Pursuing an access agenda to K-12 computer science provides policymakers a rare opportunity to address equity, workforce, and education issues on a bipartisan basis. We must continue the bipartisan support and momentum we have seen for this critical subject.

Choose a State

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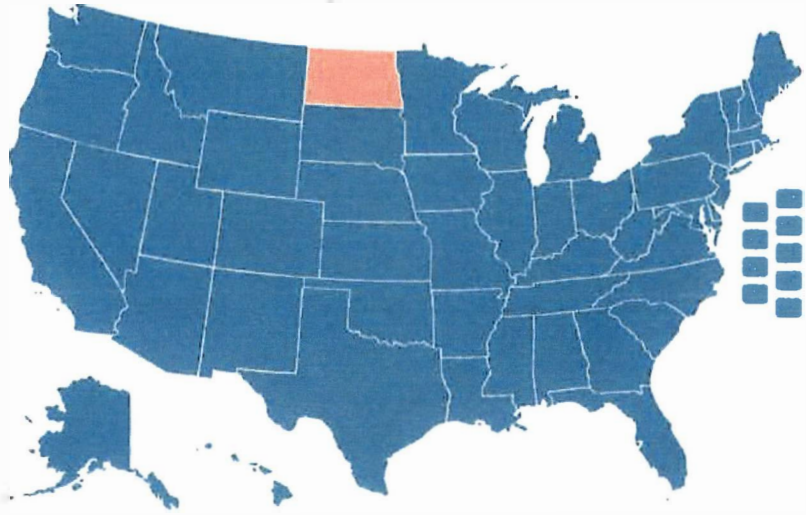
3-5-19
#1



North Dakota

806

3/2/2019 Promote Computer Science | Code.org

Open computing jobs
(**2.8x** the state average demand rate)

162

Computer science graduates

Policy Environment (**rubric (http://bit.ly/9policiesrubric)**):

- **No dedicated state funding for CS PD**
- **Does not require all high schools to offer CS**
- **K-12 CS standards in progress**

▶ AP Stats

View state fact-sheet
(//code.org/advocacy/state-facts/ND.pdf)

Take action in your state
(https://www.votervoice.net/Code/campaigns/58463/respond)

Sources: **The Conference Board (http://www.conference-board.org/)** and **National Center for Education Statistics (http://nces.ed.gov/)**. **More info (https://docs.google.com/document/d/1gySkitxlJn_vwb8HIIKNXqen184mRtzDX12cux0ZgZk/pub)**.

SB2171
3-5-19
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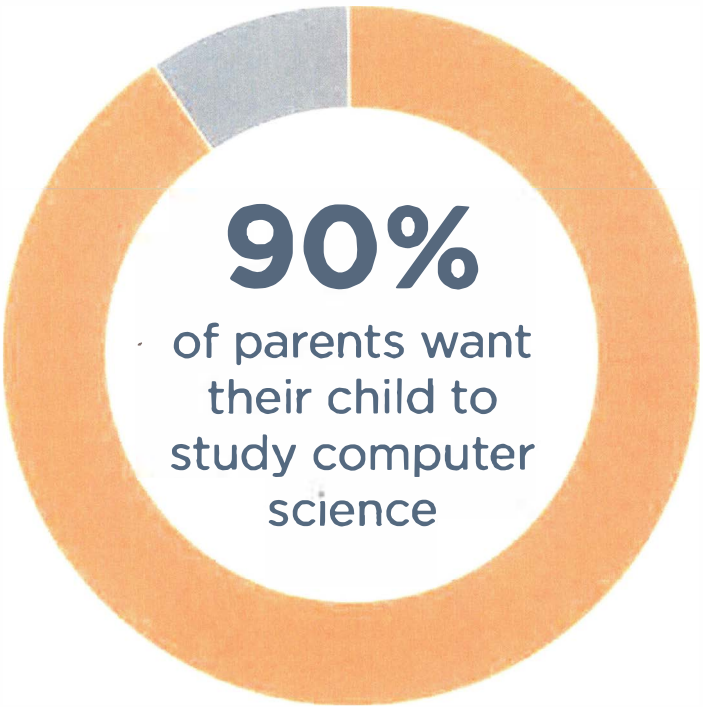
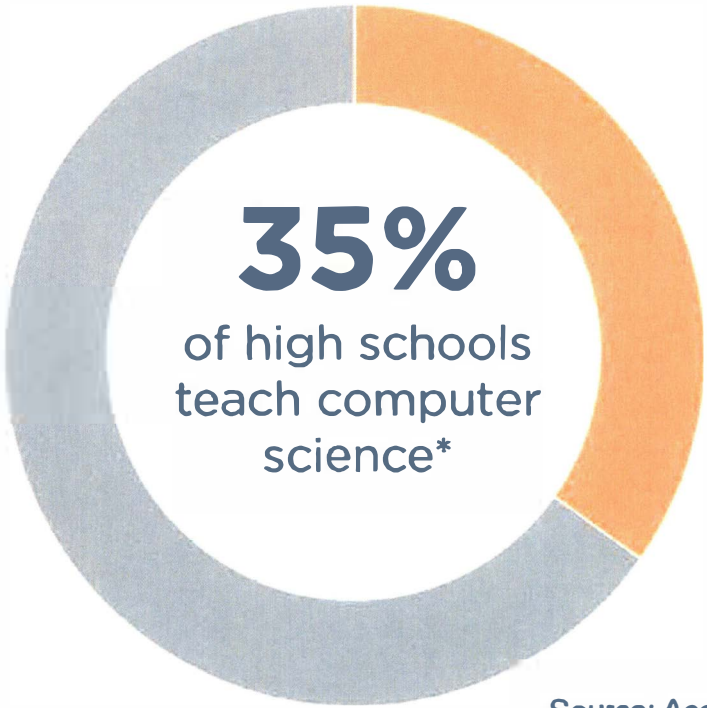
But fundamentally, this is the picture we need to solve





Source: Access Report

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3-5-19
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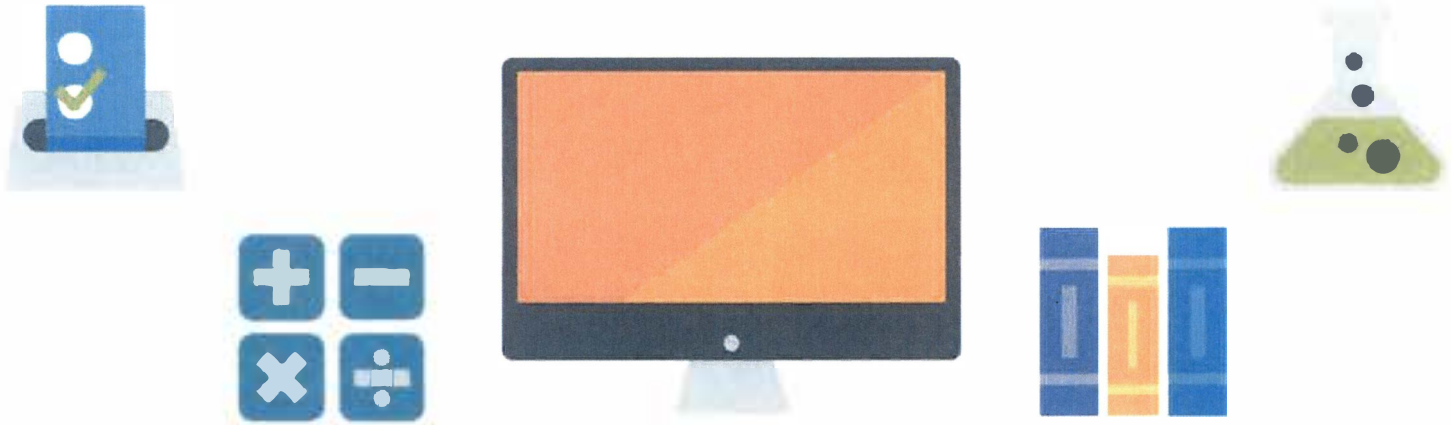
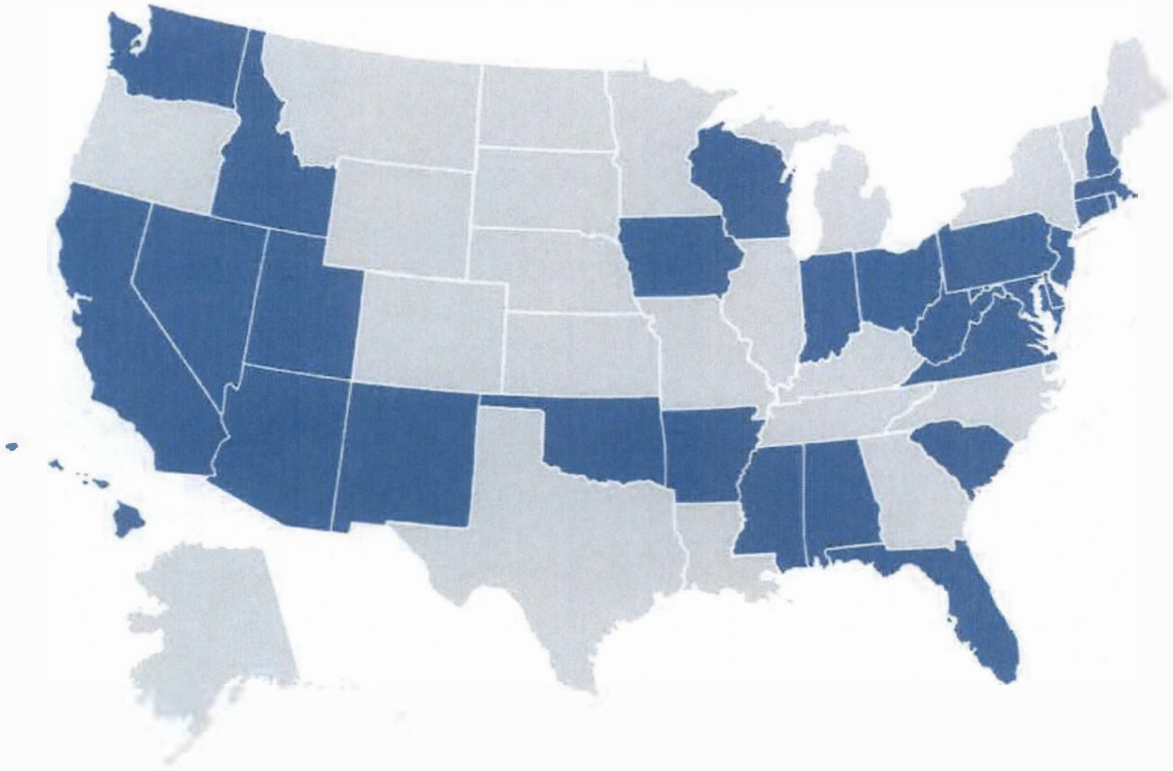
83% of parents and **64% of principals** in rural and small towns



believe offering computer science is more or equally as important as any required course.

SB 171
3-5-19
#1

The state of K-12 computer science standards



Only 28 states have created K-12 computer science standards.

Momentum is building, but we still have a long way to go.

States with K-12 CS standards

States without K-12 CS standards

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3-19
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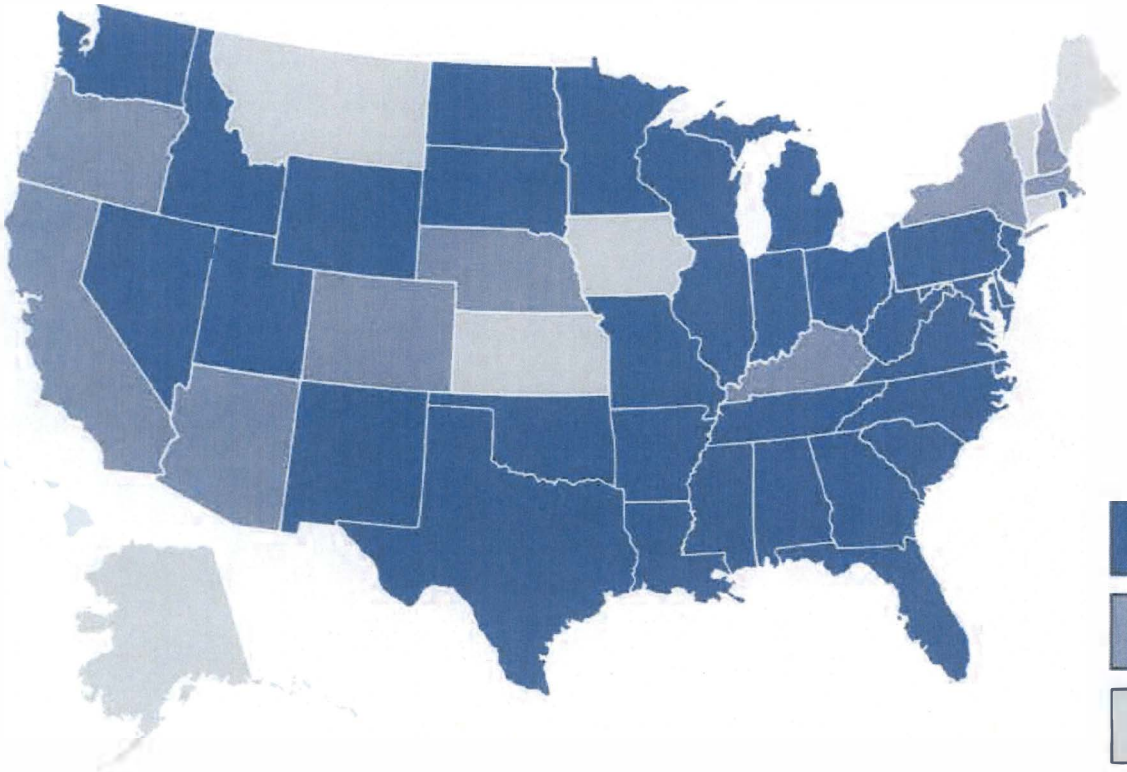
CS can count for graduation in 42 states + DC



In 42 states plus DC, computer science can count towards high school graduation math or science requirements **- up from 12 states in 2013.**

- Computer science counts statewide
- Computer science can count (school decides)
- Computer science is an elective

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3-5-19
#1

Our state policies can help fix this picture...

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3-5-19
#1

Some may think:

Computer science is just about learning technology

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3-5-19
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~~Computer science is just about learning technology~~

Computer science is about logic, problem solving, and creativity

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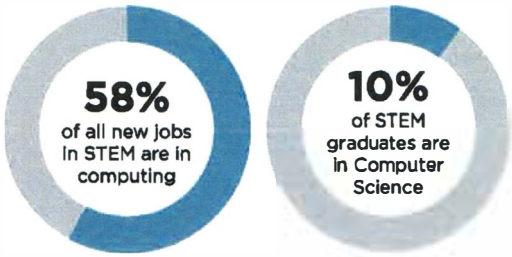
3-5-19
#1

Support K-12 Computer Science Education in North Dakota

Computer science drives job growth and innovation throughout our economy and society. Computing occupations are the **number 1 source of all new wages in the U.S.** and make up over half of all projected new jobs in STEM fields, making Computer Science one of the most in-demand college degrees. And computing is used all around us and in virtually every field. It's foundational knowledge that all students need. But computer science is marginalized throughout education. Only 35% of U.S. high schools teach any computer science courses and only 10% of STEM graduates study it. We need to improve access for all students, including groups who have traditionally been underrepresented.



93% of parents want their child's school to teach computer science, but only 35% of high schools teach it.

75% of Americans believe computer science is cool in a way it wasn't 10 years ago.

67% of parents and 56% of teachers believe students should be required to learn computer science.

50% of Americans rank computer science as one of the two most important subjects of study after reading and writing.

Students who learn computer science in high school are 6 times more likely to major in it, and women are 10 times more likely.

Computer science in North Dakota

- North Dakota currently has **806 open computing jobs** (2.8 times the average demand rate in North Dakota).
- The average salary for a computing occupation in ND is **$70,218,** which is significantly higher than the average salary in the state ($48,130). The existing open jobs alone represent a **$56,595,748 opportunity** in terms of annual salaries.
- North Dakota had only **162 computer science graduates** in 2017; only **10%** were female.
- In North Dakota, only **22% of all public high schools teach computer science.**
- Only **69 exams were taken in AP Computer Science by high school students in** North Dakota in 2018 (54 took AP CS A and 15 took AP CSP).
- Only 9% were female (9% for AP CS A and 7% for AP CSP); only 1 exam was taken by Hispanic or Latino students (1 took AP CS A and 0 took AP CSP); only 2 exams were taken by Black students (2 took AP CS A and 0 took AP CSP); only 1 exam was taken by American Indian or Alaska Native students (0 took AP CS A and 1 took AP CSP); no exams were taken by Native Hawaiian or Pacific Islander students.
- Only **12 schools** in ND (22% of ND schools with AP programs) offered an AP Computer Science course in 2017-2018 (13% offered AP CS A and 6% offered AP CSP), which is 2 more than the previous year.
- Universities in North Dakota did not graduate a single new teacher prepared to teach computer science in 2016.

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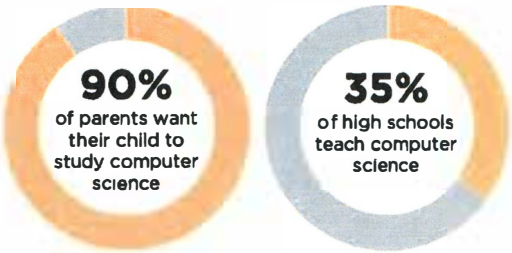
3-5-19
#1

What can you do to support K-12 CS education in North Dakota?



1. Nominate a teacher for a professional learning scholarship: **www.code.org/nominate**
2. Send a letter:
    - To your school/district asking them to expand computer science offerings at every grade level: **www.code.org/promote/letter**
    - To your elected officials asking them to support computer science education policy in North Dakota: **www.votervoice.net/Code/campaigns/58463/respond**
3. Find out if your school teaches computer science or submit information about your school's offerings at **www.code.org/yourschool.**
4. Visit **www.code.org/educate/3rdparty** to find out about courses and curriculum from a variety of providers, including Code.org.
5. Visit **www.code.org/promote/ND** to learn more about supporting computer science in your state.

Code.org's impact in North Dakota

- In North Dakota, Code.org's curriculum is used in
    - 22% of elementary schools
    - 11% of middle schools
    - 7% of high schools
- There are 1,525 teacher accounts and 45,156 student accounts on Code.org in North Dakota.
- Of students in North Dakota using Code.org curriculum last school year,
    - 11% attend high needs schools
    - 55% are in rural schools
    - 45% are female students
    - 26% are underrepresented minority students (Black/African American, Hispanic/Latino, American Indian, or Hawaiian)
- Code.org, its regional partner(s) Technology & Innovation in Education, and 2 facilitators have provided professional learning in North Dakota for
    - 315 teachers in CS Fundamentals (K-5)
    - 7 teachers in Exploring Computer Science or Computer Science Discoveries
    - 3 teachers in Computer Science Principles

"Computer Science is a liberal art: it's something that everybody should be exposed to and everyone should have a mastery of to some extent."

— Steve Jobs

SB 2171
3-5-19
#1

What can your state do to improve computer science education?

States and local school districts need to adopt a broad policy framework to provide all students with access to computer science. The following nine recommendations are a menu of best practices that states can choose from to support and expand computer science. Not all states will be in a position to adopt all of the policies. Read more about these 9 policy ideas at https://code.org/files/Making_CS_Fundamental.pdf and see our rubric for describing state policies at http://bit.ly/9policiesrubric.

☐ North Dakota **has not** yet created a state plan for K-12 computer science. A plan that articulates the goals for computer science, strategies for accomplishing the goals, and timelines for carrying out the strategies is important for making computer science a fundamental part of a state's education system.

☐ North Dakota is in the process of developing K-12 computer science standards.

☐ North Dakota **does not yet** provide dedicated funding for rigorous computer science professional development and course support. Although funds may be available via broader programs, the state can strengthen its computer science programs by creating specific opportunities to bring computer science to school districts, such as matching fund programs.

☑ North Dakota has clear certification pathways for computer science teachers.

☐ North Dakota **has not yet** established programs at institutions of higher education to offer computer science to preservice teachers. The computer science teacher shortage can be addressed by exposing more preservice teachers to computer science during their required coursework or by creating specific pathways for computer science teachers.

☐ North Dakota **does not yet** have dedicated computer science positions in state or local education agencies. Creating a statewide computer science leadership position within the state education agency can help expand state-level implementation of computer science education initiatives. Similar positions at the local level could support districts' expansion of course offerings and professional development.

☐ North Dakota **does not yet** require that all secondary schools offer computer science. The state can support the expansion of computer science courses by adopting policies that require schools to offer a computer science course based on rigorous standards, with appropriate implementation timelines and allowing for remote and/or in-person courses.

☑ North Dakota allows computer science to count for a core graduation requirement. Find out how North Dakota allows computer science to count towards graduation at http://bit.ly/9policies.

☐ North Dakota **does not yet** allow computer science to count as a core admission requirement at institutions of higher education. Admission policies that do not include rigorous computer science courses as meeting a core entrance requirement, such as in mathematics or science, discourage students from taking such courses in secondary education. State leaders can work with institutions of higher education to ensure credit and articulation policies align with secondary school graduation requirements.

Follow us!

Join our efforts to give every student in every school the opportunity to learn computer science. Learn more at code.org, or follow us on Facebook and Twitter.

SB 2171
3-5-19
#1

Launched in 2013, Code.org® is a nonprofit dedicated to expanding access to computer science, and increasing participation by women and underrepresented students of color. Our vision is that every student in every school should have the opportunity to learn computer science.

Data is from the Conference Board for job demand, the Bureau of Labor Statistics for state salary and national job projections data, the College Board for AP exam data, the National Center for Education Statistics for university graduate data, the Gallup and Google research study Education Trends in the State of Computer Science in U.S. K-12 Schools for parent demand, the 2018 Computer Science Access Report for schools that offer computer science, and Code.org for its own courses, professional learning programs, and participation data.

SB 2171
3-5-19
#2

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Testimony of Deana Wiese
Executive Director

In Support of SB 2171
March 5, 2019

Chairman Owens and Members of the House Education Committee:

My name is Deana Wiese, and I am executive director of the Technology Council of North Dakota (TechND). I am here today voicing support of SB 2171, which allows the Superintendent of Public Instruction to credential computer and cyber science teachers.

TechND, formerly known as the Information Technology Council of North Dakota (ITCND), was created in 2000 by North Dakota business, government and education leaders who recognized the need to strengthen the state's information technology infrastructure and reposition the state as a national leader in IT. The organization has since expanded its focus to include members from the technology industry as a whole. TechND has nearly 70 member organizations, with representatives from both the public and private sector. TechND is also a founding member of the Digital Workforce Coalition. This newly formed coalition is made up of organizations, companies and trade associations who recognize that base computer science skills are necessary to the future workforce of our state.

North Dakota's economy is strong, and the state's technology industry is no exception. North Dakota has seen an increase of more than 27 percent in technology occupations over the past decade and is projecting a 20 percent increase for the next 10 years. This growth equates to more than 6,500 new and replacement technology positions over the next decade. These jobs aren't only in the technology industry – computer and cyber science skills are vital to virtually every industry across the state, including energy, agriculture, healthcare, finance and manufacturing. A shortage of skilled technology workforce continues to be a challenge for all of these industries, many times hindering economic growth because positions cannot be filled, leaving organizations without the resources to grow in our state. Therefore, the development of a high-quality workforce is vital to the future growth of North Dakota.

TechND strongly supports the Department of Public Instruction's (DPI) efforts to expand the delivery of computer and cyber science education throughout North Dakota and this bill

provides an important piece of the puzzle in properly preparing teachers. This is an opportunity for our state's educational system to lead the nation as we move forward into a more technical workforce. Allowing the Superintendent of Public Instruction the ability to credential computer and cyber science teachers will be critical as we aggressively move forward to equip all North Dakota students with nation-leading technical education.

We ask for your favorable consideration of SB 2171.

SB 2171
3-5-19
#3

Testimony of Maggie Glennon
Director of State Government Affairs, Code.org

In Support of SB 2171
March 5, 2019

Chairman and Members of the House Education Committee,

My name is Maggie Glennon with Code.org, a non-profit dedicated to expanding access to computer science and member of the North Dakota Digital Workforce Coalition. I am here in support of SB 2171, which allows the Superintendent of Public Instruction to credential computer and cyber science teachers.

Ensuring we have enough teachers available to teach computer science and cyber-science is the single most important and sustainable investment we can make to expand computer science opportunities across the state.

Computer science and cybersecurity are foundational skills for K-12 students. They develop students' computational and critical thinking skills and teaches them how to create–not just use–new technologies. More than half of projected jobs in STEM fields are in computer occupations, and computer science is one of the most desirable degrees from new college graduates.

Right now in North Dakota, there are currently 739 unfilled computing jobs (2.6 times the average job demand rate in ND) but with only 117 computer science graduates, and just 7% of those graduates are female. These jobs reach every industry; from energy, banking, transportation, agriculture, and manufacturing. A shortage of a skilled technology workforce continues to be a challenge for all of these industries and the development of a high-quality workforce is vital to North Dakota's growth.

Even when 90% of parents want their children to learn computer science, just 35% of high schools nationally teach computer science, and in North Dakota, that number drops to only 22% of high schools.

We strongly support DPI's efforts to expand the delivery of computer and cyber science education throughout North Dakota and this bill provides an important piece of this approach in properly preparing teachers.

Thank you.

SB 2171
3-5-19
#4

Testimony of Rudie Martinson

Executive Director, North Dakota Hospitality Association

Testimony in Support of SB 2171
March 5, 2019

Chairman Owens and Members of the House Education Committee,

My name is Rudie Martinson and I am here today representing the North Dakota Hospitality Association to add our voice in support of Senate Bill 2171, which would allow the superintendent of public instruction to credential teachers of computer and cyber science.

Now you might wonder why the hospitality industry would care about computer science education, but it should be obvious. Some of the most innovative and tech-savvy companies in the country are in the hospitality industry. The hotel and restaurant industry has been transformed by technology. Online reservations, online ordering, venue specific mobile apps, and even electronic charitable gaming have created a significant demand for computer-proficient workers in the hospitality sector.

This is why we were proud to join the Digital Workforce Coalition to support efforts by DPI and others to move the needle on this important workforce development priority for all sectors of North Dakota's economy.

The hospitality sector is a perfect example of why investing in these skills is so important. Every aspect of our industry has been impacted by technology. We would benefit greatly from a future workforce where skills like coding, website design, and application programing were as common as high-school level reading, writing, and math.

Furthermore, the hotel and restaurant industry has also been heavily targeted by hackers looking to steal personal and payment information from our customers. We need to ensure our future workforce is prepared to securely interact with the new systems and software that are constantly being developed, updated, and implemented industry-wide.

I hope the committee will support the Department in their efforts to advance computer science education in our state. Teachers who are credentialed and trained to teach computer science are critical to the success of new standards developed by DPI and other stakeholder groups. They will not only help North Dakota students build the

valuable skills they need for a global, connected economy, but will also provide a talent pipeline for employers, both large and small, who are desperately seeking workers with these skills.