



Illinois State Board of Education

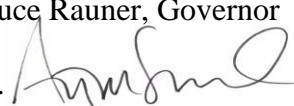
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James T. Meeks
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Tony Smith, Ph.D.
State Superintendent of Education

MEMORANDUM

TO: The Honorable John J. Cullerton, Senate President
The Honorable Jim Durkin, House Minority Leader
The Honorable Michael J. Madigan, Speaker of the House
The Honorable Christine Radogno, Senate Minority Leader
The Honorable Bruce Rauner, Governor

FROM: Tony Smith, Ph.D. 
State Superintendent of Education

DATE: June 30, 2017

SUBJECT: Illinois Task Force on Computer Science Education Report

The Illinois Task Force on Computer Science Education Report delineates research-based findings and recommendations pursuant to Public Act 099-0647. The primary charge of this Task Force is to issue a report that details how all Illinois students will be provided the best possible K-12 computer science educational experience if these recommendations are adopted for legislation. Included in the report are findings on K-12 computer science education in Illinois and other jurisdictions, best practices in K-12 computer science education, and funding recommendations to support these best practices.

Specific recommendations included in the report are as follows:

- Ensuring every student in every Illinois public school minimally has access to a computer science course within three years of any legislation passed as a result of this recommendation;
- Establishing an operational definition of “K-12 computer science education” as proposed herein;
- Requiring each school in the Illinois K-12 system to add data to the Illinois Report Card that is specific to courses offered that are designated as aligned to the aforementioned operational definition of K-12 computer science education;
- Revising the licensure/endorsement obtainment process for prospective preservice and in-service K-12 computer science educators;
- Implementing a high school graduation requirement for computer science for all Illinois high school students;

- Creating dedicated ISBE course codes exclusive to and aligned with the aforementioned operational definition of K-12 computer science education;
- Creating and supporting dedicated positions at ISBE whose primary job duties center on ensuring ongoing growth of K-12 computer science education;
- Allocating dedicated, ongoing funding exclusively toward supporting continued measurable growth in K-12 computer science education statewide to benefit all students and our state's economy.

This report is transmitted on behalf of the chair of the Task Force, Steve Svetlik, who is president and founder of the Chicago Suburban Chapter of the Computer Science Teachers' Association. He is a mathematics and computer science teacher at Adlai E. Stevenson High School in Lincolnshire. For additional copies of this report or for more specific information, please contact Brian Houser at 217/524-4832 or bhouser@isbe.net.

cc: Tim Anderson, Secretary of the Senate
Timothy Mapes, Clerk of the House
Legislative Research Unit
State Government Report Center



Illinois State Board of Education

James T. Meeks, Chairman
Tony Smith, Ph.D., State Superintendent

Illinois Task Force on Computer Science Education

Final Report and Recommendations

**Prepared by the Members of
the Illinois Computer Science Education Task Force**

**Respectfully Submitted to the Honorable Bruce Rauner, Governor,
and to the Illinois General Assembly**

Submitted pursuant to PA 099-0647

#CS4IL #CSForAll

June 2017

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Illinois State Board of Education

Illinois Task Force on Computer Science Education

Final Report

Submitted to the Honorable Bruce Rauner, Governor, and the Illinois General Assembly

June 2017

This report of the Illinois Task Force on Computer Science Education (the Task Force) is respectfully submitted to the Governor and the Illinois General Assembly.

Executive Summary

This report details both the findings and the recommendations for “substantially increasing computer science education and the capacity of youth to obtain the requisite knowledge, skills, and practice to be educated in computer science” in accordance with the statutory authority provided in section (g) of [Public Act 099-0647](#) and as required by the charge to this Task Force stipulated in section (f) of the same.

Findings

Findings collected by the Task Force are detailed as follows:

- There is inconsistent access to authentic, research-based, rigorous, engaging, and pedagogically sound computer science (CS) education across the grade bands and across Illinois’ more than 800 school districts, as substantiated by [a recent Gallup/Google research study](#).
- There is a complete absence of a well-established, canonical, *operational* definition of K–12 CS education in Illinois, applicable specifically (but not exclusively) to teacher licensure and endorsement criteria and to categorization of uniquely identifiable CS course offerings by course code **distinguishing** computer science from career and technical education (CTE), digital literacy, and other easily mistaken alternatives to computer science.
- Illinois currently does not collect timely or accurate data pertaining to which K–12 public schools specifically offer students CS courses, nor are data kept providing strong evidence of the CS course content taught among those courses that are reported as “CS” courses, as such data are self-reported at the district level (frequently self-reported erroneously, as noted in the minutes of discussions with Illinois State Board of Education [ISBE] officials during Task Force meetings). For example, the state only requires school districts to self-report their locally defined and locally created CS courses by selecting a course code from an ISBE course catalog. Task Force members had dialogue and made inquiries to ISBE to determine that the state currently has insufficient oversight

of these course designations. For example, the course code that a school district self-selects as aligned with the locally taught course may vary widely in both content and skills level with what is actually being taught in the course. This presents a definitive barrier in tracking longitudinally, with any fidelity, who is teaching what content to which students attending which schools. Simply put, Illinois has no ability to collect evidence at the state level and therefore cannot track growth in expansion of K–12 computer science education over time. See table titled *Insufficient State Data*¹ for an example of the deficits.

- Illinois’ current pathways toward granting teachers a middle school or high school endorsement in CS create barriers to increasing the pool of qualified teacher candidates sufficient to meet the needs a statewide expansion of K–12 CS education would present. Specifically, (1) requiring an arbitrarily defined 24 semester hours of college-level coursework (of which 12 hours must be minimally upper level), and (2) requiring the successful completion of an Illinois Licensure Testing System (ILTS)/Pearson Endorsement Exam in CS means that the combined financial cost and the time needed to complete these requirements serves as a deterrent for many prospective preservice and in-service teachers in pursuing the endorsement. Further, there is no specificity as to what topics germane to K–12 CS education should be covered across these 24 semester hours of “CS coursework.” Finally, the required endorsement exam administered by ILTS/Pearson is in no way correlated with the semester hour requirement associated with obtaining the endorsement. Further, it is built upon [a framework](#) that is demonstrably archaic in reference to modernized “future-proof” [K-12 CS education standards](#) (e.g., by its reference to the current use of “PASCAL” in education in the Study Guide provided for it).

Problem with State Course Catalog

One data set provided to the Illinois Computer Science Task Force at the first meeting on February 14, 2017, listed 524 students during fiscal year 2016 (the 2015–16 school year) as taking the course "AP Computer Science AB." Yet FY 2009 (2008–09) was the *final* year that the College Board offered "AP Computer Science AB" as an Advanced Placement (AP) course. Further, May 2009 was the final instance in which the AP test for that course was offered. This has two significant impacts on current course offerings:

- There are 524 students whose CS experience cannot be traced to a specific set of content standards and skills developed.
- In addition, if the College Board had been notified about the course misalignment, those school(s) which had been self-reporting the local course taught as "AP Computer Science AB" could have found themselves in violation of College Board copyright infringement law due to falsely identifying a given course as an AP course. (The College Board is a nonprofit, but AP is nonetheless a proprietary program and the acronym "AP" is itself trademarked.)
- Further, the College Board mandates definitive regulations by which schools and teachers identify AP course(s) and determine who is eligible to teach that course. Violating these regulations can put schools in jeopardy of losing their entire AP programs. And teachers could de facto potentially jeopardize their right to teach future AP courses.

¹ At the time of this report, “AP Computer Science AB (course code: 10158A000)” was still listed on the public-facing ISBE web page with the link to the Secondary Course Catalog.

- There is substantial evidence pointing to a disconnect between the perceived need for expanded K–12 CS education by Illinois principals and the expressed need by parents, school staff, and school boards. (See [Google/Gallup research study](#).)

Summary of Recommendations

The Task Force has developed eight recommendations to submit to the General Assembly in response to the findings described earlier in this report. These recommendations are summarized below and are expanded upon later in this report:

1. Ensure sustained access to CS education statewide by requiring every high school to offer at least one CS course within three years.
2. Establish an operational definition of “K–12 computer science education.”
3. Require that each school in the K–12 system provide additional data to the Illinois Report Card regarding courses offered that are designated as aligned to the definition of computer science. These data will include student enrollment disaggregated minimally by gender, ethnicity/race, and free and reduced-price lunch status. The purpose of these data is to measure the progress toward successful implementation of #CSForAll across Illinois, specifically with the demographics of CS course enrollment reflecting each school’s demographics within 10 years.
4. Revise the state licensure process for prospective preservice and in-service K–12 CS educators.
5. With the expressed intent that computer science will eventually become a high school graduation requirement, convene a second CS education task force within three years of the date of this report to determine the timeline, plan, and action steps to implement this requirement.
6. Create a dedicated course code for K–12 CS education to ensure that all courses categorized as CS courses are aligned to the operational definition of CS recommended in this report. This should not result in the loss of funding for current CS courses and programs coded under CTE.
7. Create and support, through ongoing funding, a stand-alone “Office of Computer Science Education” headed by an ISBE principal consultant for computer science education.
8. Allocate dedicated, ongoing funding for K–12 CS education to broadly support charge (4) of section (f) of PA 099-0647 and, specifically, the recommendations outlined in the previous bullet points, at the discretion of the state superintendent of education or their designee (in particular, the principal consultant for computer science education).

A Case for K–12 Computer Science Education for All Illinois Students

UCLA senior researcher Jane Margolis published a book in 2008 titled *Stuck in the Shallow End: Education, Race, and Computer Science* that would quickly become a key reference in the decade that followed in establishing the urgency for expansion of computer science education into all of our nation’s K–12 schools. Margolis’ book summarized the findings of a multiyear research project conducted in the Los Angeles Unified School District that, at its core, identified

clear systemic inequities guiding which schools offered any CS courses for its students. The book further described belief systems long entrenched in public schooling that perpetuated stereotypes of who “belongs” in a CS course and, of critical significance, who does not. In particular, Margolis found in her research that CS courses were predominantly populated by White males and Asian males. Put differently, the homogeneity evident in the student populations she studied perpetuated the very homogeneity in the industry these courses sought to study.

Margolis further established the magnitude of the issue in asserting the following about CS and CS education in particular. (See text box on right.)

“This new discipline is now having a seismic impact across disciplines and professions.”

“Occupations, industries, and undertakings as diverse as HIV and influenza research, air safety, psychological inquiry, the elimination of world hunger, studies of the world’s climate, and the Human Genome Project, just to name a few, would all be crippled without the benefit of computer science. On a grand scale, computer science is transforming knowledge and the scientific questions that can be investigated.”

Meanwhile, only 123 Illinois high schools (or 17 percent of all Illinois high schools offering any advanced placement [AP] courses) specifically offered AP Computer Science A in the 2015–16 school year. That is the single course for which the state has historically had access to any reliable statistics to track the growth of CS education over the past two decades.² There were 2,938 AP CS A test takers in Illinois -- 21.1 percent were female, 1.8 percent were Black, and 11.2 percent were Hispanic. (See [data provided by the College Board and analyzed by Barbara Ericson of Georgia Tech University](#).) Given that 14.5 percent of Illinois’s total population identifies as Black and 15.6 percent identifies as Hispanic, there is a clear discrepancy in the student test takers being accurately representative demographically of the population of Illinois at-large.

Indeed, nearly a decade after Margolis published *Stuck in the Shallow End*, the innovations borne from CS have affected and continue to affect our lives, our economy, our access to information, and our ability to form new understandings about our world at an ever-increasing rate. Some of this impact is understood by its consumers, but much of it is still a mystery. Society grows increasingly dependent on technologies, with increasingly less understanding of what makes them work and the effect they have on our society. Further, there remains a considerable portion of our population -- very much right here in Illinois -- that lacks access to these technologies, creating a veritable “digital divide.”

Skills developed in the study of CS have become invaluable for today’s employers on a global, national, and — germane to this report — state level. A recent [news release](#) published by LinkedIn identified the top 10 skills that prospective employers identified as most in demand by analyzing all recruitment activity undertaken by these employers. Each of these skills is deeply rooted in the study and application of CS.

As far as the impact of CS on our national and state economies, Hadi Partovi, co-founder and CEO of the nonprofit Code.org, wrote the following in [an article](#) published in January 2017:

² It should be noted that, as identified in a Task Force meeting, even these data are also limited in that they do not reflect how many students actually enrolled in the course and/or took the course to completion, but rather these are the students who actually sat for the end-of-course examination.

“This decade, computing occupations have become the single [largest sector of new wages](#) in the U.S. This isn’t just about future jobs. It’s about more than [500,000](#) currently open jobs. These are among the [best-paying](#) jobs in the country. And these job openings are growing almost [twice as fast](#) as all the other jobs in the country. Even before automation changes the picture, computing jobs already outpace manufacturing jobs. For example, in the Detroit area, there are only 1,150 open manufacturing jobs with a median salary of \$46,350. In the same market, there are 6,150 open computing jobs with a median salary of \$97,850.”

“The opportunity is larger than the 500,000 open jobs in computing. Each time you fill a high-paying computing job, you [create 5 more local jobs](#) in the neighborhood. When you factor in the growth in computing jobs, you have an opportunity to add over a trillion dollars to the economy over the next decade.”

It is easy to assume that these jobs exist exclusively in Silicon Valley or other commonly recognized “technology hubs” outside of Illinois, but the opposite is true. According to [research conducted by the Conference Board and updated monthly](#), as of the submission date of this report, 21,627 open computing jobs exist in Illinois alone (four times the annual demand rate for jobs in Illinois). The average salary for a computing job in Illinois is \$89,465, so if each of these jobs were filled, an additional \$1.9 billion of income would be brought into the Illinois economy.

But the urgent need to interject CS into the core set of learning experiences for K–12 students goes far beyond filling jobs in the tech sector. A broader set of skills was identified as most valued by employers in prospective hires in another [recent news release](#) published by the World Economic Forum. This set of skills, as a collective, illustrates a growing demand for the kind of thinking that inherently is developed in studying computer science, irrespective of a student’s eventual place in the workforce. Jeannette Wing, corporate vice president of Microsoft Research and former head of Carnegie Mellon University’s Computer Science Department, broadly classified this set of skills as “computational thinking,” [encapsulating the skills in a recent article as follows](#):

“Computational thinking involves solving problems, designing systems, and understanding human behavior by drawing on the concepts fundamental to computer science.”

This same concept of computational thinking skills ultimately entered the high school educational space via the College Board with the nationwide launch in 2016–17 of a new AP course purposely built to extend CS education to a much broader audience: AP Computer Science Principles. Computational thinking skills are described in the most recently released [AP Computer Science Principles Course and Exam Description](#) as being at the heart of the course’s curricular and instructional design. (See text box above.)

“In this course, students will develop computational thinking skills vital for success across all disciplines, such as using computational tools to analyze and study data and working with large data sets to analyze, visualize, and draw conclusions from trends.”

In the same document, six computational thinking practices identified as integral to student success in mastering the course content are strikingly similar to the skills identified in the aforementioned news release by the World Economic Forum.

Finally, a [growing body of research](#) suggests that stereotypes defining who “belongs” in a CS course and who does not begin to form among students as young as 6 years old. This issue is not about simply addressing how CS can be interwoven in high schools but rather how it can be interwoven across all K–12 grade bands.

The evidence from an increasing number of sources points clearly to the urgent need to bring Illinois out of “the shallow end.” And although an enormous amount of effort has been invested by a relatively small, but ever-increasing, group of passionate educators, philanthropists, nonprofits, and industry executives, the need ultimately requires state and federal policymakers to help make access to K–12 CS education for all students across Illinois a reality. A bipartisan [Governors’ Partnership for K-12 CS Education](#) has recently emerged. Many of the leaders in the member states of this group have legislated comprehensive solutions for bringing K–12 CS education to all students in their respective states. This would indicate that now is the opportune time for Illinois to make the commitment to join the growing list of states that have taken demonstrable action toward making K–12 computer science education for all students a reality.

Expanded Description of Recommendations

Recommendation 1: Secondary CS Course

- 1. Ensure sustained access to CS education statewide by requiring every high school to offer at least one CS course within three years.**
 - Fewer than half of all schools teach CS. This lack of access hurts state economies and creates major inequities in education, particularly for those groups that have been traditionally underrepresented in CS. States and local school districts recognize the need for change. Illinois recently enacted policies to allow CS courses to count toward core mathematics or science high school graduation requirements. This step is a good one, but it is only the first of many.
 - To begin to address the issue of access, Illinois should adopt a policy that requires all high schools to offer at least one CS course based on rigorous standards within three school years. Illinois has 970 schools with high school grades, according to the National Center for Education Statistics, and it can be conservatively assumed that 25 percent of these schools already offer at least one rigorous computer science course ([Google/Gallup](#)). Thus, at a minimum, 728 additional teachers would need to receive professional learning to teach computer science in order to reach this goal. The Task Force believes it is possible to leverage high-quality professional learning providers to help in-service teachers meet this goal within three school years if the endorsement adjustments that are being recommended are made.
 - The Task Force strongly recommends allocating funding specifically for K-12 computer science professional learning to achieve this recommendation. The majority of schools in the state do not have computer science programs or teachers. Local education authorities use funding that is allocated broadly to science, technology, engineering and mathematics (STEM) programs for existing mathematics and science programs even if it is permissible for the funding to be used for computer science. The evidence of this is clear as STEM funding has been a priority for states and the federal government for the past 15 years, but access to rigorous K-12 computer science courses remains low.
 - It was only very recently (2015) that computer science officially became federally recognized as a STEM subject. (See [Code.org](#).) The Elementary and Secondary Education Act was reauthorized shortly thereafter as the Every Student Succeeds Act (ESSA). This allowed Local Education Agencies to have more freedom to allocate a portion of monies earmarked for STEM directly, exclusively, and explicitly toward computer science education. (See [Office of Innovation and Improvement](#).)
 - The General Assembly should consider that this funding will be a one-time investment (ideally spread over three years to allow for scaling) intended to establish small cohorts of teachers in schools where there is no computer science. Our model suggests that, on average across the industry, it will cost \$6,000 per teacher for robust high-quality professional learning to prepare an existing teacher. (See <http://bit.ly/PLfundcalc> for a resource states can use to model costs for professional learning using this one-time funding approach.) This model can be cost effective both because funding will not be dedicated to hiring new teachers and because this funding will be a one-time push to retrain part of the existing teaching workforce. Once teachers are established at schools,

existing streams of funding (federal or state professional development dollars) can be used to continue to support these teachers.

- The Task Force recognizes the inherent challenges with increasing/improving any teaching force. However, the members believe that it can be achieved by training teachers from any subject area. Currently, CS teachers most often come from either a primarily mathematics or primarily CTE/business background. However, if certification requirements are expanded, as described in these recommendations, the Task Force believes that there is substantial evidence that, in conjunction with high-quality professional learning, any teacher can develop the skills and knowledge necessary to teach introductory computer science courses. There are, of course, exceptions to this.
- ISBE provided a list of teachers holding the computer science endorsement in Illinois to the CS Task Force. There were several problems with these data:
 - (1) They were current only through FY 2016, almost a full two school years in arrears. No current endorsement data were available.
 - (2) Errors were identified in the available data, which led to uncertainty about the reliability of the state records.
 - (3) The data include 661 allegedly distinct teachers, spanning K–12 grade bands, who are reported to hold the endorsement. A thorough teacher-by-teacher analysis of this list would need to be conducted in order to track precisely who holds the 9–12 CS endorsement to satisfy the current certification requirements and/or the proposed recommendation.
 - (4) The remaining educators referenced by "Educator ID" (aka the Illinois Educator Identification Number) are either inactive, recently retired, or potentially deceased. Therefore, the data are incomplete and possibly misleading.

Recommendation 2: CS Operational Definition

2. Establish an operational definition of K–12 CS education.

- The Task Force members formally decided by voice vote after much deliberation, research, and inquiry that K–12 computer science education be rooted in the [definition of computer science](#) as established in the [K-12 Computer Science Framework](#).
- Further, the Task Force wishes to emphasize what computer science is -- and what it is *not* -- for the purpose of developing an operational definition. The following is from pages 13 and 14 of the K–12 Computer Science Framework:

“The K–12 Computer Science Framework clarifies not only what computer science is but also what students should know and be able to do in computer science from kindergarten to 12th grade. Computer science builds on computer literacy, educational technology, digital citizenship, and information technology. Their differences and relationship with computer science are described below.

- *Computer literacy* refers to the general use of computers and programs, such as productivity software. Previously mentioned

examples include performing an internet search and creating a digital presentation.

- *Educational technology* applies computer literacy to school subjects. For example, students in an English class can use a web-based application to collaboratively create, edit, and store an essay online.
- *Digital citizenship* refers to the appropriate and responsible use of technology, such as choosing an appropriate password and keeping it secure.

These aspects of computing are distinguished from computer science because they are focused on using computer technologies rather than understanding why they work and how to create those technologies. Knowing why and how computers work (i.e., computer science) provides the basis for a deep understanding of computer use and the relevant rights, responsibilities, and applications.”

Recommendation 3: Student Enrollment Data

- 3. Require each school in the K–12 system to provide additional data to the Illinois Report Card regarding courses offered that are designated as aligned to the definition of computer science. These data will include student enrollment disaggregated minimally by gender, ethnicity/race, and free and reduced-price lunch status, specifically with the demographics of CS course enrollment reflecting each school’s demographics within 10 years.**
- The state must provide data on which schools are offering CS courses and, among those schools, which students are enrolled in these courses (as identified minimally by the student’s gender, ethnicity/race, and free and reduced-price lunch status). This is a fundamental part of being able to track whether the State of Illinois is truly making progress toward high-quality CS education for all students. There is currently little incentive to ensure that these data are reported in a timely and accurate manner each school year because, as noted in the findings in this report, current CS enrollment is self-reported by school districts. Including these data on the school Report Card would indicate that the state holds CS education of paramount value for all students and places the onus on individual districts via a public-facing document to ensure that they, too, place a high enough value on CS education to stand behind it in print. Citizens will be able to then compare which schools are achieving growth in this critical discipline and which are not, specifically with regard to achieving equity in enrollment.

Recommendation 4: State Licensure

- 4. Revise the state licensure process for prospective preservice and in-service K-12 CS educators.**
- It is essential that effective approaches to computer science teacher preparation and licensure are created in order to ensure that all Illinois students have access to the foundational skills of computer science. The CS Task Force acknowledges that Illinois has a head start with the middle school and senior high computer science endorsement

programs and encourages ISBE to expand on this endorsement by creating a tiered program that spans single-course “micro-credentials” for current in-service teachers to a full senior high certification program in computer science. Further, pathways should not overlook the preparation of elementary teachers and generalists in gaining a liberal arts fluency in computer science.

- The following includes recommendations for immediate, short-, and long-term actions for state-level policymakers:
 - **Immediate term: Allow teachers to teach computer science under a temporary license after receiving state-approved, high-quality professional development.**

This program would be for teachers who are currently teaching computer science courses or who are needed to begin teaching these courses in the next school year and have completed some professional development in teaching computer science. This approach allows Illinois to scale the computer science teaching force quickly while providing time for the state to build capacity in offering a full certification pathway.

The professional development would be aligned to specific courses and be of high quality as determined by ISBE with input from computer science education stakeholder groups, including secondary teachers and representatives from higher education, industry, computer science organizations in Illinois, and national computer science organizations. The Task Force believes that a good starting point would be professional development courses from nationally recognized high-quality providers like Exploring Computer Science, the College Board-endorsed professional development programs for AP CS Principles and AP Computer Science A, and Code.org’s CS Discoveries programs. The Task Force recommends that the state look to the immediate term certification pathways developed in both Arkansas and Utah ([Teacher Pathway Recommendations](#), Code.org) as examples.

The Task Force also believes that ISBE should reassess the need for these temporary endorsements in five years. It may be possible to phase out temporary endorsements as full certifications and preservice preparation pathways are developed. Teachers who receive this temporary endorsement should be allowed to continue teaching the specific courses, even if this option is phased out over time.

- **Medium term: Modify Part 20 of the Illinois Administrative Code to include a fundamental understanding of computer science and methods for introducing it in the elementary grades.**

This content should be based on the early childhood and K–5 recommendations in the [K–12 Computer Science Framework](#) and include topics such as computing systems, the internet, data, algorithms and programming, and the impacts of computing on society. Pedagogical methods should include practices, such as fostering an inclusive computing culture, computational thinking, communication, and collaboration, and emphasize approaches and examples for integrating computer science with other elementary subject areas.

These concepts and practices can be reflected as an additional section in the Standards for Endorsements in Elementary Education and titled *Technology Standards for Elementary Teachers*. The content and methods can be taught by updating existing educational technology courses in teacher preparation programs and/or a combination of professional development opportunities.

- **Long term: Create a full certification pathway for high school computer science teachers to earn after completing requirements similar to other pathways in the state.**

Illinois is ahead of the curve with its current middle and high school endorsements in computer science; however, these pathways do not outline the required coursework, and there are no programs endorsed by ISBE for certification as a computer science teacher. Instead, teachers must receive their professional educator license in another subject area and then earn an add-on endorsement in computer science.

Regarding the supply and demand for computer science teachers in Illinois: Only 123 schools in Illinois offered AP computer science in 2016 (Code.org). And only 51 college graduates across the country received an initial teaching certification in computer science in 2015 (2015 Title II Reports). The Task Force felt that it was clear that there is a shortage of computer science teachers in Illinois that reflects a nationwide shortage. Illinois does not have any programs for providing initial teaching certifications in computer science (primary licensure, not an endorsement) and the current add-on endorsement requires 24 semester hours of graduate level coursework; therefore, it is recommended that Illinois adjust the certification process in the immediate term to initialize the system with enough computer science teachers to ensure all students in Illinois have access to these foundational courses and can acquire skills.

It is recommended that the coursework should, at a minimum, include the following:

For general education coursework: The candidate would complete coursework pursuant to general teacher certification (e.g., this may include curriculum design and development, educational psychology, and technology in the classroom) and a passing score on a state-approved assessment on teaching and learning.

For computer science education pedagogy: The candidate would complete a methods course in computer science and class observations and practice teaching (pursuant to existing teacher certification requirements in Illinois).

For computer science content: The candidate would complete computer science coursework at the level of receiving a minor, bachelor's degree, or higher in computer science and pass a state-approved computer science certification assessment as appropriate.

Illinois currently has a computer science certification assessment, but the Task Force recommends that ISBE review the current computer science content exam for teachers, as it has not been updated since at least 2012³. Both Pearson and Educational Testing Service are in the process of developing new content exams for computer science, and the Task Force members encourage ISBE to adopt one of these new exams or develop one internally to replace the current offering.

Recommendation 5: CS Graduation Requirement

- 5. With the expressed intent that computer science will eventually become a high school graduation requirement, convene a second CS education task force within three years of the date of this report to determine the timeline, plan, and action steps to implement this requirement.**
 - The body of research and evidence presented heretofore in this document indicates that our understanding of what constitutes “the academic core” in schooling must change to include a seat at the table for CS. Task Force members understand that the refinement of required coursework is a complex, nuanced issue. They unanimously agreed by voice vote to recommend that the General Assembly legislate a follow-up task force within the time frame specified above with the expressed intent to focus specifically on how to develop a plan comprised of action steps in the spirit of supporting the adoption of an eventual statewide CS graduation requirement (just as was done recently for all students in the city of Chicago).

Recommendation 6: Aligned Course Code

- 6. Create a dedicated course code for K–12 CS education to ensure that all courses categorized as CS courses are aligned to the operational definition of CS recommended in this report. This should not result in the loss of funding for current CS courses and programs coded under CTE.**
 - It is vital to all stakeholders that CS be separated from all other potentially related disciplines as was described in the recommended operational definition of CS earlier in this report. This separation gives CS the best opportunity of becoming more globally recognized as a “legitimate,” stand-alone core discipline, as opposed to being enveloped within another broader field. This approach further alleviates potential confusion of what CS is and is not in concert with the recommended operational definition of CS as noted earlier in this report. Critical to note: Some CS courses are identified under the wider CTE umbrella for funding purposes, but Task Force members firmly stand behind our recommendation that in creating a new “course code” for CS, dedicated CS funding through alternative sources other than Perkins (such as through ESSA monies) become part of the centralized state plan for bringing CS to the forefront as a core discipline.

³ The copyright date of the Study Guide for the ILTS 038 Exam (Computer Science) is 2012. A content expert panel convened last year (May 2016) in which ILTS/Pearson and ISBE were present and recommendations were made on changing/updating the exam. The Task Force is aware of no changes to date.

Recommendation 7: Office of Computer Science Education

- 7. Creating and supporting through ongoing funding a stand-alone “Office of Computer Science Education” headed by an ISBE principal consultant for computer science education.**
 - The CS Task Force members strongly recommend that ISBE be provided dedicated ongoing funding exclusively allocated to establish and to maintain per annum the creation of a state-level Office of Computer Science Education, led by a state-level principal consultant for computer science education. The purpose of the creation and development of this office shall be to oversee the ongoing development and maintenance of statewide access to K–12 computer science education. The principal consultant for computer science education shall work directly with the Office of the State Superintendent of Education to ensure that all students (including and especially the aforementioned underrepresented/underserved demographic groups) will have equitable access to the highest-quality, research-based computer science education possible.
 - The process by which courses are identified to be satisfactorily categorized as computer science courses shall include input by an advisory board established by the Office of Computer Science Education on an annual basis to include representatives of key stakeholder groups. The set of stakeholder groups invited for representation on the advisory board shall be the same as those stipulated in section (a) of 105 ILCS 5/2-3.167.
 - A fundamental responsibility of the staff employed within the Office of Computer Science Education shall be to leverage the most current academic research and the most current school-level computer science enrollment data possible by ISBE to ensure that school personnel are empowered through the assistance of this office to continuously develop their computer science education programming.

Recommendation 8: Ongoing Funding

- 8. Allocate dedicated, ongoing funding for K–12 CS education to broadly support charge (4) of section (f) of PA 099-0647 and, specifically, the recommendations outlined previously in this report, at the discretion of the state superintendent of education or their designee (in particular, the principal consultant for computer science education).**
 - The Task Force respectfully recommends that the General Assembly support the proposed recommendations by collaborating and working with key stakeholder groups and nonprofits with the personnel and the knowledge base necessary to make concrete funding recommendations rooted in well-developed research practices so that the state can uphold its duty to providing the best possible K–12 CS educational experience to its students while simultaneously maintaining its fiduciary duty of being good stewards of taxpayer monies.

Appendices

Appendix A:
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Appendix B:
Member Directory



Illinois State Board of Education

James T. Meeks, Chairman
Tony Smith, Ph.D., State Superintendent

ISBE Computer Science Education Task Force

2017

Location 1

Illinois State Board of Education
100 N. First St.
Springfield, IL 62777
Video Conference Room

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Illinois State Board of Education
100 W. Randolph St.
Chicago, IL 60601
Video Conference Room

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Appendix C: Resource List



Illinois Computer Science Education Task Force Resource List - 2017

Overview

The following resources are suggested readings for members of the Illinois Computer Science Task Force. The documents and reports listed below are intended to offer members key background information to facilitate a deeper understanding of computer science education that can inform their recommendations. Task Force members and staff at the Midwest Comprehensive Center and ISBE have developed this resource list containing descriptive information that defines computer science education, laws, and best practices from various jurisdictions and key research of computer science education to support the identification of key issues, leverage points, and promising practices.

Committee members are encouraged to review the documents online via the links provided. **This resource list is a working document;** resources will be added as they become available for the duration of the Task Force meetings. Task Force members have created a [Computer Science Task Force \(IL\) google doc](#), where many resources can be conveniently accessed.

Computer Science Overview

- [The Report of the SREB Commission on Computer Science and Information Technology \(2016\)](#)

This report offers five actions for states and schools to help learners, especially young girls, Black and Hispanic students, and students from low-income families, learn computer science and explore and choose careers in computing fields. The actions show how schools can teach computer science and computational thinking in ways that deepen students' mastery of core academic subjects. The full report also surveys the disciplines, workforce needs, and current state of computer science education at the K-12 and postsecondary levels.

- [Support K-12 Computer Science](#)

This fact sheet produced by code.org summarizes the state of the computer science industry in Illinois, including projected job needs. The document includes advocacy recommendations for getting involved.

- [K-12 Computer Science Policy and Implementation in States](#)

This working document developed by code.org explores policy and CS implementation efforts across various states, including brief summaries of laws, both mandated and permissive.

- [K12 Computer Science FAQ](#)
This Frequently Asked Questions (FAQ) document defines computer science as: "Computer science is the study of computers and algorithmic processes, including their principles, design, implementation, and impact on society (Tucker, 2006, p. 2)."
- [The Case for Improving U.S. Computer Science Education](#)
This 2016 report by the Information Technology and Innovation Foundation discusses the merits of computer science as one of the most important fields within STEM.

Research

- [K–12 Computer Science Framework](#)
The framework is the combined work of the Association for Computing Machinery, Code.org, Computer Science Teachers Association, Cyber Innovation Center, and National Math and Science Initiative. The framework was developed for states, districts, schools, and organizations to inform the development of standards and curriculum, build capacity for teaching computer science, and implement computer science pathways. Task Force members may find Chapter 8 on implementation guidance particularly useful.

Best Practices

- [Nine Policy Ideas to Make Computer](#)
This document from code.org examines the nine policies considered fundamental to K-12 computer science education.

State Models

- [STEM Computer Science Workgroup Recommendations \(Final\)](#)
This four-page document contains final recommendations by members of an Iowa computer science working group. The [final bill](#) was just passed based on Task Force recommendations of the Iowa CS Education Workgroup.
- [State Computer Science Policy 2017](#)
This 2017 snapshot compiled by code.org contains summaries on legislation, both passed and pending, in many jurisdictions. The [2016 summary](#) is also available.
- [Joint Task Force on Computer Science and Information Technology](#)
Recommendations that the South Carolina Joint Task Force on Computer Science and Information Technology put together.
- [Computer Science and Technology in Public School Task Force: Report of Activities, Findings, and Recommendations](#)

This 2016 report of the Arkansas Computer Science Task Force contains information and suggestions regarding Arkansas’ needs for recruiting, professional development, parent and community engagement, and other critical success factors for the state’s CS initiative. The 2016 report builds on recommendations set forth in the [2015 report](#).

- [Building the Texas Computer Science Pipeline](#)

This report of the Texas Computer Science Task Force identified barriers to the development of a robust computer science pipeline in Texas high schools and makes recommendations for overcoming or mitigating the barriers to improve student access.

Member Materials

- <https://public.tableau.com/profile/publish/ILCSTaskForce/Sheet1#!/publish-confirm>

This tree graph was created by Task Force member Don Yanek. Hover the mouse over each element for more details.

- [State Planning Worksheet - Draft](#)

State planning tool developed by Code.org.

Appendix D:
Meeting Minutes for All IL CS Task Force Meetings



Illinois State Board of Education

James T. Meeks, Chairman
Tony Smith, Ph.D., State Superintendent

Illinois Computer Science Task Force Meeting Minutes

Meeting Summary by Task Force Members

Wednesday, February 14, 2017

10:00 a.m.–1:00 p.m.

Illinois State Board of Education, Videoconference Room (3rd Floor), 100 N. First St.,
Springfield, Illinois

Illinois State Board of Education, Videoconference Room (14th Floor), 100 W. Randolph St.,
Suite 14-300, Chicago, Illinois

Attendees

Task Force Members

Chicago

Jenna Garcia, Code.org
Ali Karbassi, CoderDojoChi
Steve Svetlik (chair), Computer Science Teachers Association
Brenda Wilkerson, Chicago Public Schools
Don Yanek, Chicago Teachers' Union

Springfield

Austin Betz, Illinois Federation of Teachers
Randy Swikle, Illinois Press Association
Jerry Weinberg, Southern Illinois University

Illinois State Board of Education (ISBE) Staff

Brian Houser

Midwest Comprehensive Center (MWCC) Staff

Nicol Christie
Jeremy Rasmussen



Illinois State Board of Education

James T. Meeks, Chairman
Tony Smith, Ph.D., State Superintendent

Meeting Objectives

- Elect chairperson
- Approve bylaws
- Develop next steps

Computer Science Taskforce Meeting 1

Mr. Houser welcomed everyone to the first meeting of the computer science (CS) education task force. He took the task force through their charge:

- 1) Analyze the current state of CS education in Illinois
- 2) Analyze current CS education laws in other jurisdictions, both mandated and permissive
- 3) Identify best practices in CS education and other jurisdictions
- 4) To make recommendations to the General Assembly focused on substantially increasing computer science
- 5) To make funding recommendations, if the Task Force's recommendations to the General Assembly would require a fiscal commitment.

Mr. Houser said the summary of findings and recommendations will be submitted no later than July 1 (2017). One member commented that the focus will be to make recommendations to the general assembly focused on substantially improving CS education and the capacity of youth to obtain the requisite knowledge, skills, and practices to be educated in computer science

Mr. Houser then went over Robert's Rules of Order and their related procedures.

Mr. Houser said that after a chairperson is elected, the task force will need to vote on the task force bylaws. He then went over the responsibilities of the chairperson and guidelines for public participation.

Mr. Houser said the item that they will use for their first charge is the 2016 Illinois computer science secondary enrollment dataset.

Ms. Christie then guided the task force's introductions:

- Mr. Karbassi is the founder of CoderDojoChi, which teaches children ages 7–17 computer programming. He said that what interested him in the task force is that there are

not enough opportunities for elementary and middle school students to take courses in computer science.

- Mr. Svetlik is a teacher of CS and math at Stevenson High School in Lincolnshire. He said he has two goals mind: 1) To ensure multiple pathways for K-12 teachers across the state to obtain the CS Endorsement from ISBE AND to ensure current endorsements are easily-renewable; 2) To build off of Chicago’s CSForAll Initiative to ensure equitable access to K-12 CS coursework throughout all of Illinois.
- Ms. Garcia is the Midwest Regional Manager for code.org. She said Code.org’s mission is to bring CS to every elementary, middle, and high school in the country, which this task force speaks to.
- Mr. Yanek has been a high school teacher for 27 years. For 22 of those years he taught computer science. He said he is currently the department chair of CS at Northside College Prep High School. He also was a founder and former president of the Chicago chapter of the CS teachers’ association. He said that what interested him regarding this task force was that he truly believes that CS is a necessary skill for all of the students from K through 12. He said he hopes that this task force will focus on gender equity, ethnic diversity, and students with disabilities. He said he would also like to see conversations around teacher prep (both in-service and pre-service teachers).
- Ms. Wilkerson is the Director of CS and IT education for Chicago Public Schools (CPS). She works closely with Mr. Yanek and that her goal is to make CS available to all students. She has worked with Illinois State University and Northeastern Illinois University to put together a cohort of in-service teachers who are going back to school for their CS credential. She said equity and diversifying the teaching workforce have been a big focus in her work with Illinois State University and Northeastern Illinois University.
- Mr. Betz is a high school math teacher Belleville West High School. He has been teaching math for 10 years and this is his second year in CS. He said that where he lives, there are jobs that could be filled by people with a CS background, but there are just not enough people to fill that vacuum. He said he is excited to move this forward statewide.
- Dr. Weinberg is a professor of CS from Southern Illinois University Edwardsville, where he was the chair for five years. He currently serves as the associate provost for research and dean of the graduate school. His background on research has been on National Science Foundation grants and studying how robotic activities impact interest in self-efficacy. He said his interest is to see how we can make students interested and continue on beyond K–12 and into higher education.
- Mr. Swikle he is a teacher at Johnsborg High School. He has been on the board of directors for the Illinois Press Foundation. He said he is here representing the Illinois Press Foundation and their interests, which include computer protocol, ethics, engagement, motivational strategies, and etcetera.

Mr. Houser then went over how a task force operates. He said the biggest thing is that a task force first needs to establish the work plan, which lays the foundation for what the task force wants to accomplish.

Ms. Christie then went over the meeting structures with the task force and what to expect.

Mr. Houser went over the roles of the chairperson, and then the task force proceeded with electing the chairperson.

Mr. Svetlik nominated himself and Mr. Yanek seconded. Mr. Svetlik said he wanted to acknowledge the work of the city of Chicago, especially in regard to the launch of CS for All. He said a lot of talent makes up this task force. He said he stands behind providing CS to all of Illinois and expanding the work already done in Chicago.

Mr. Houser asked that all those in favor of Mr. Svetlik as chairperson say “aye”; everyone said “aye,” with no one opposed.

The task force then briefly reviewed the bylaws. Mr. Houser had two points he wanted to make. He said that per section 1.6, “absent task force members may be represented by designees.” He said it would help in advance if we (Mr. Houser and Ms. Christie) could be notified if someone will be filling in. Second, he noted that the adoption and alteration of the bylaws needs a two-thirds vote.

Ms. Garcia had a question on section 1.2 regarding vacancies. She noted that there appear to be two vacancies on the task force appointment roster. She asked if the roster was closed as of today, or if the vacancies can be filled.

Mr. Houser reported that the task force was waiting to hear back from appointees, but stated that it is his understanding that those appointees will technically not be on the task force. He said that those two vacancies were reserved for legislators. There will be two legislators serving on the Task Force.

Mr. Karbassi had a question on section 1.6 regarding notification about having a designee represent a task force member. He asked how much time for notice is required. Mr. Houser said that there is no set time, but that 48 hours would be ideal and 24 hours would be sufficient.

Dr. Weinberg said that section 1.4 has the date as June 31, 2017, but that the actual act states the due date is July 1. Mr. Houser said that the change would be made.

Dr. Weinberg then asked whether the task force needs an open meetings act officer; Mr. Houser said no. Mr. Houser is the Open Meetings Act designee for the Task Force.

Mr. Svetlik made a motion to approve the bylaws as amended. Ms. Wilkerson seconded. There were no objections, and all were in favor.

Mr. Houser went over the 2016 CS enrollment data. He said these data include CS courses as well as CS-like courses (e.g., career and technical education courses). These data are supposed to give a general sense of how many students are taking CS courses. He said that course catalogue titles and descriptions are provided. He said he believes it is a fairly comprehensive list of what the state offers in terms of CS courses.

Mr. Yanek said he had two questions. He asked if the catalogue numbers are specifically for computer science. Second, he asked if these data are accurate because the “Advanced Placement (AP) CS AB” course was ended by the College Board about five years ago.

Mr. Houser, in answer to Mr. Yanek’s second question, said these are the state course codes. At the local level, they can name their course whatever they want, but when local schools report the data, they have to match it up to an Illinois state course code. Because of this requirement, sometimes individuals at the local district are not familiar with this process and accidentally match it up incorrectly. In answer to his first question, Mr. Houser said he thinks it is just the AP courses that are actually entitled computer science. He said he believes the other ones, such as career and technical education (CTE) courses, are “computer science-like.”

Mr. Svetlik asked if there is a way they can get the data in a visualized format (e.g., a heat map) that would allow the Task Force to see where students are taking designated courses under the CS umbrella across the state of Illinois. He also asked how additions to or removals from this list would occur. Third, he would like to know what the state’s formalized definition of CS is. He said he is not personally familiar with working with a school district that has CTE. He asked whether it is something done statewide or at the local level.

Ms. Wilkerson said in her work with other districts across the country, many times the organization of CTE and CS are under the same umbrella, unlike in Illinois. She asked if that discussion (the separation of CTE and CS) is part of the task force’s purview and how that would impact ISBE’s decision about where CS lands, and specifically, how it is funded. She said she also has questions about whether or not any of our classes are reflected in these enrollment data.

Mr. Houser said he would try to answer each question. For the ones he can’t, he will try to provide additional information at a later point. In regard to the heat map, he said he knows ISBE has done things like that in the past and that it was something they could try to develop. He said as far as additions and removals of CS classes go, he was not familiar with that process. In regard to the formalized definition of CS, he said that might be something for the task force to think about.

Mr. Houser said he does not believe that there is a secondary institution in the state of Illinois that has a sole teacher prep program for CS education. He said teachers can earn a CS endorsement, but that this is different from a CS-certified teacher.

Mr. Yanek asked whether this is only an endorsement because there is no secondary level or K–8 CS certificate in Illinois. Mr. Houser confirmed that yes, this is how it stands right now.

Mr. Yanek then talked about the CS endorsement. He said that Illinois State University, through a National Science Foundation-funded project created a Teacher Education Computer Science (TECS) endorsement, and that they are currently taking high school math teachers and offering them the opportunity to add a CS endorsement. There is a similar program at Northeastern Illinois University; that program has a partnership with ISU. Investigating the work ISU has already done might be something the task force wants to consider.

Ms. Garcia added on to Mr. Yanek’s comment. She said that Praxis is the Illinois-approved CS endorsement test, and that they are currently rewriting their CS certification tests. She said a potential recommendation for the general assembly might be for the state to offer a CS

certification. She also said the task force should consider (as a recommendation) to drop the AP CS AB title from the course catalogue. She said this change might help keep track of the right courses.

Mr. Karbassi said there are other courses (within the catalogue) that are almost the same thing (e.g., CTE course on web development, and web development non-CTE). He said it seems that some of these courses could be rolled into each other.

Mr. Houser said some of them might have near identical titles, but for our (ISBE) reporting purposes we want to know CTE from non-CTE courses for funding purposes.

Ms. Wilkerson said historically there was a division within Illinois's Perkins regulation between computer programming and computer science.

Mr. Svetlik asked a question regarding CS endorsements. He asked, if a teacher has a CS endorsement, but not CTE, does this mean that the teacher is not allowed to teach CTE courses?

Mr. Houser said, from a funding standpoint, if you are not a CTE-licensed teacher then you are not going to get Perkins funding to teach a CTE-designated course.

Mr. Svetlik said he would like, as a task force, to get really clear on what CS is and to have that noted in the minutes.

Mr. Karbassi said he would like to see data that break down the age, ethnicity, and gender of students taking CS classes, as well as parental income.

Mr. Houser said he thinks pulling that data is possible; he will need to check who is available to help him do that. He noted that it might be a good idea to have someone from teaching licensure attend a meeting to provide more specifics.

Mr. Svetlik asked if that could be arranged for March; Mr. Houser said yes.

Ms. Garcia said she would like the data to include a breakdown of teachers (e.g., X number of students being taught across X number of students). She also asked if there is a reason why it is fiscal year 2016 (on the course catalogue) and not the 2016–17 school year.

Mr. Houser reported that data are typically behind that way in being reported.

Ms. Wilkerson also asked if they could get data breaking down this information (age, ethnicity, and gender, teacher to student ration) by district as well as when (in what grade) students are taking these courses.

Mr. Karbassi asked if they could get those data in a CSV form if possible.

Mr. Svetlik added, for the sake of clarity, that he thought it would serve the public most for the task force to get data centered on who is taking these courses, at what schools, taught by which teachers under which endorsements.

Mr. Karbassi felt it would also be great to know if career counselors are aware of CS opportunities for students that show interest; he would like to know how many career counselors have this awareness, and how many schools have career counselors in general.

Ms. Wilkerson said that some of the data they are asking for likely exists and can be pulled, but that some of it likely would need to be retrieved. She asked if this task force has the ability to create surveys to get this information, especially in regard to what school districts think CS is.

Mr. Houser responded to Mr. Karbassi's question about career counselors, saying that ISBE does not collect this kind of data. In response to Ms. Wilkerson's question, he said developing a survey might be something to consider, but noted that the return rate is often low and that the data are often not necessarily comprehensive.

Dr. Weinberg said that, rather than try to understand how school districts define CS, it might be helpful instead to examine professional societies and their definitions of CS. He said this might help the task force in its definition of CS.

Mr. Svetlik said both perspectives on CS definitions should be considered. He said this task force should hear from the minds of K–12 administrators who set up these offerings for students, as well as the university and industry perspective. He said that next he would like to discuss, around the table, what CS is in order to develop a definition. Mr. Yanek replied that they were unlikely to come up with a definition today.

Mr. Svetlik said he is looking for a filter to streamline the work, and that coming up with a definition of CS might provide that filter. He then asked Ms. Wilkerson and Mr. Yanek about their working definition of CS and also asked to hear about their success stories.

Ms. Wilkerson said she doesn't know verbatim their definition, but one of the goals was to take into consideration what CS has become and the details of where it is now. She said what they had wanted to do was broaden the definition of CS to include computational thinking, problem solving, abstraction, and all those things that come into play in computer programming, but that are not limited to programming. She said they wanted to introduce many facets of CS on an introductory level that went beyond programming. She noted that one of the conversations that this task force will need to have is: Can the CS success Chicago experienced be achieved on a statewide level?

Mr. Yanek offered a statement (that he borrowed from a peer) that he feels helps students understand CS: "I can use computing to ask questions to make sense of the computational things in the world." He thinks this statement covers a lot of things people do in computing.

Dr. Weinberg said a definition usually lets some areas in and cuts others out. He said things like human and robotic interaction can be computational, but are not things that necessarily require a keyboard or monitor. He asked the task force how broad it wants the definition to be.

Mr. Karbassi said maybe it would be helpful to look at what CTE is first, and then come back to CS.

Mr. Svetlik said that it seems like we don't have a clear understanding right now of how teacher licensure currently filters teachers in and out, and how this serves as a barrier to students. He

suggested clarifying what the task force is really talking about, and then expanding that and developing something good for everyone.

Mr. Svetlik indicated that one of the task force's charges is to make funding recommendations. He asked about the degree of interest, if the task force made a recommendation, among the general assembly to add (funds) to what we currently have.

Ms. Garcia said she has a Google document that the government affairs team at code.org put together. She reported that one of the bullets in the document addresses best practices for CS education in other jurisdictions, and that there are nine policies that the government affairs team has found that are helpful in ensuring state longevity. She said the second bullet is a state planning toolkit that says a CS task force (such as this one) should define CS and establish rigorous K–12 CS standards. She said establishing rigorous K–12 CS standards could be a recommendation they make to the general assembly. She mentioned that the document cites a group that just released a framework for K–12 CS, and she wondered whether it would be helpful to look at that framework and the definition of CS that it uses.

Mr. Yanek said he would like to go back to the distinction between CTE and CS. He said, looking at the “CS A” course description and the CTE computer programming course, that he felt both of these are CS classes, and that the only difference is the words used in the description.

Ms. Wilkerson noted that those two classes that Mr. Yanek mentioned come from different funding sources. He offered the opinion that a conversation that needs to happen is how the task force can break down the barriers that created those separate funding lines.

Mr. Karbassi noted that the AP designation means a lot to students, but pointed out that in the computer programming course in the handout, the AP course had fewer students than the non-AP course.

Ms. Wilkerson responded that sometimes this results from giving students who want to take an introductory computer programming course the opportunity to do so instead of taking an AP course right off the bat. Mr. Yanek added that some schools might require advanced algebra as a prerequisite before they can take the computer programming AP course.

Mr. Betz said another thing to keep in mind is that these are not the course descriptions from the schools, but from ISBE, and that there are likely all kinds of CS classes being put under that one description. In response, Ms. Wilkerson asked if there was a way to get the original descriptions of CS courses that the local school districts use.

Mr. Houser made the side point that CTE classes typically don't offer a math credit; with CS courses math credit is sometimes awarded.

The task forces then began discussing their work plan.

Ms. Garcia said that, as the task force thinks about the work plan, it might be a good idea to look at the recent Iowa CS task force and find out if they could join the task force as guests, or if the task force wants anyone from the state level from any of the examples cited in the Google document. She said to just let her know, and that she can work on getting them here.

Mr. Svetlik said, in regard to resources, there are K–12 Computer Science standards that would be available for public review starting the next day. He said the standards might offer a potential working definition of CS. He also mentioned that there had been a Google/Gallup joint poll conducted with school administrators around the country and that Illinois was one of the focal states.

Ms. Garcia noted the task force might also want to look at the K–12 Computer Science Framework.

Mr. Houser said one thing for the task force to think about is whether there should be a mandate that requires a CS course.

Mr. Svetlik said he thinks there is a clear feeling among the group that whatever it does should be done with a lens that truly serves all students at the K–12 level.

Ms. Wilkerson said we live and breathe what it takes to make a change like that (CS that truly serves all students at the K–12 level) occur. She said what they need to address here are the different levels of stakeholders that need to be brought into this discussion to make this change happen.

Ms. Garcia pointed out that one of the recommendations in the document is the nine public-facing policies that we push. She said if you could get the top four in, it really helps drive the state of CS education:

1. Having dedicated CS funding
2. State-level CS standards
3. Having a state plan (Alaska and Rhode Island are the only two states that have plans)
4. Requiring all high schools to offer CS

She went on to list the other five recommendations:

5. Certification in CS
6. Preservice incentives
7. State CS position
8. CS counts toward high school graduation (math or science credit)
9. CS counts toward higher education admission

Ms. Garcia said that, regarding next steps, the task force might want to think about homework for the next meeting in terms of what questions should be answered, or who the task force wants feedback from (anecdotally or in person).

Mr. Yanek replied that maybe the task force needs an answer to the question: Why do we think that any of this is even important? He pointed out that there are people outside of the room that

are going to read about this task force and think the goal is to create more software engineers, but that this is not really the goal. He said he likes to think of access to CS as being the modern-day social justice issue—that you can't participate in the modern economy unless you have some kind of understanding about CS.

Ms. Wilkerson noted that the task force can do this work and can come up with recommendations, but that if the state puts it on the shelf and does not give it any weight, the task force's efforts become a waste of time.

Mr. Svetlik asked how the task force can get people from the general assembly to follow the discussion and review any collected data and how to get people in the public to be a positive part of the process. He then asked if people from the General Assembly would end up attending some of these meetings.

Mr. Karbassi noted that the group's job is to educate as well, and that one thing that is sad to watch is seeing legislation at the national level; the lack of knowledge of the people approving or denying access to CS is appalling.

Mr. Betz pointed out that when the group is making these decisions and having these discussions, it needs to keep in mind the purpose. He said that, as educators, we sometimes get stuck thinking we need to teach this for the sake of education, but often the students are not there for the sake of education. He said the students also need to be getting something practical out of it for their future.

Mr. Svetlik expressed how grateful he was for the people around the table, and for Ms. Christie and Mr. Houser and what they are doing to organize everyone's thoughts.

Three next steps were discussed:

- Send resources
- Identify reading questions and research
- Identify speakers for future meetings

Ms. Wilkerson argued that one of the high-level things they need to start with is the research. She said it would be interesting to see how other task forces went about finding where best practices existed in their state. Mr. Svetlik cited Iowa and Idaho as potential states to look at.

There was discussion around the fact that a committee has been working with Pearson to revamp licensure requirements around CS. Mr. Svetlik said it might be a good idea to get in touch with that committee to help ensure continuity between what they are doing and what this task force is doing. Ms. Garcia responded that perhaps it's less about pulling the reins and more about working collaboratively together.

Ms. Wilkerson said it might be a good idea to look at larger states (population-wise) like Illinois with large metropolitan areas to see where they are with CS education, and if they have any information to provide to us. The states mentioned in response were New York, California, Florida, and Georgia.

Ms. Christie asked if it would be helpful to have a matrix of these states; there was a unanimous yes. Mr. Karbassi asked if it would be possible to get data from these states as well, and Ms. Garcia said yes. Mr. Svetlik added that he really likes the idea of looking at Georgia policies.

Ms. Christie then asked if there was anything the task force wanted to capture in terms of the structure for the next meeting. Ms. Wilkerson argued that, in terms of the federal level, with ESSA and with CS being declared as part of STEM and the funding aspect related to STEM, it would be good to have research on where those funds are currently being allocated—that this information would be helpful in identifying CS funding paths for the General Assembly to consider. Mr. Karbassi noted that if the task force could look at all the various data requested and observe different patterns, that it might be informative to the task force.

Mr. Yanek asked if it would be possible to create a shared repository for this information instead of using email; Ms. Garcia suggested an overarching Google doc, and it was decided that the task force would use a Google doc.

Public Comments:

Aganze Mihigo, senior at East High School in Rockford IL, offered public comment and questions to the task force. He said he was taking a project-based English course at his high school, and that for his project he chose to petition the district to start offering CS. He said he would like some input from this task force to aid the development of his proposal, and posed two questions:

- What are the long-term and short-term goals of the task force?

Mr. Svetlik responded that he would like to see CS available to every student in K–12.

- What do you expect from students who take CS?

Mr. Svetlik replied that he wants students who take CS to feel empowered and to discover their creative potential. Ms. Wilkerson related that she didn't know anything about CS when she was in high school; she said she accidentally found CS when she went to college. She said her goal is for students not to accidentally discover CS. She wants students to know what their choices are up front.

Ms. Garcia suggested that Mr. Mihigo's proposal recommend that CS be required not only in high school, but also the elementary and middle schools in the district.

Mr. Yanek said one of his goals is that the software engineers that we do create are more diverse and more representative.

Dr. Weinberg answered that for him, part of it is building a pipeline. He said you can get people from diverse backgrounds interested in CS if you just start them out at the high school level. He agreed that you do need to start engaging students in middle school or earlier.

- Do you think making CS a requirement would draw in more diversity to the field?

There was a unanimous 'yes' from the task force regarding this question.

William Rose, Academy Coach at East High School in Rockford, Illinois, commented that he liked the point earlier that CS is a modern-day social justice issue. He said computer literacy is the literacy of the 21st century, and highlighted the importance of communicating to the state and the public that this is a necessary movement, and that it needs some backbone to it at the state level. He said he was curious about the conversation around requiring that schools offer CS; he asked the task force how it would define “offer.”

Ms. Wilkerson responded that this is part of what this task force is trying to figure out, and noted that the ultimate way to get to equity is by making it required. Mr. Svetlik said offering CS earlier in a student’s life will increase the likelihood of them pursuing it further in high school, and that it is a multipronged approach.

Mr. Rose then asked if the task force has considered the fact that the CTE courses can offer as much rigor or more than AP classes, especially in regard to dual and articulated credit.

Ms. Wilkerson replied that CPS has increased the number of dual credit courses offered—in terms of giving students a level of rigor in addition to receiving a piece of paper—and that much of this is done out of CTE. She said some of the CTE courses that she chose matched up with college-level choices. She added that CPS has worked with Chicago community colleges and several area universities to create dual credit opportunities within CTE IT.

Mr. Svetlik added that a successful CS K–12 movement hinges on acceptance by the higher education community.

Public guest and principal of East High School Peter Verona, commented that he was impressed with the depth and breadth of the conversation. He said earlier that a task force member had asked, “How can we get all the people at each level to hear this discussion?” He noted that in the Illinois High School Association (IHSA) there is an expectation that every school weighs in and votes in town hall meetings. He said in education it seems all they do are surveys. He asked why there is no expectation in discussions of learning that everyone weighs in. He also said his school is contracted with an organization to help them identify students who are not choosing higher level, high-rigor courses because they don’t have the self-efficacy to take them.

Mr. Karbassi responded that having CS introduced before high school might be a way for students to develop the required self-efficacy.

High school student Karnia Sisnero commented that the task force has been talking a lot about the definition of CS. She said the programming methodologies she has seen online are mostly theoretical, because the programming part you can learn at home.

Ms. Garcia pointed out that CS is similar to mathematics—when you think of mathematics, most people think of algebra, but there is also geometry, calculus, statistics, and etcetera. She said CS is the same way; CS is an overarching field, but when you say CS most people gravitate toward programming. She said what this task force was grappling with is a definition of CS that we can give the state and the public so that everyone understands what our vision is.

Mr. Svetlik then asked student guest, Ms. Sisnero to share her own definition of CS. Ms. Sisnero replied that she thinks CS is an art, and theoretical, and problem-solving—something that seems almost scientific. Ms. Sisnero said things like Cisco don’t seem to be CS itself, but a branch with

its own separate class. Mr. Svetlik responded that he heard her mentioning a distinction between theoretical and applied CS; he said honoring the artistic end while still recognizing the theoretical part is important.

Mr. Svetlik motioned to adjourn; Ms. Wilkerson seconded. All were in favor and none opposed.

The following notes were recorded on chart paper in the Chicago meeting room by Ms. Christie:

Next Steps:

1. Send resources by end of week
2. Identify reading questions for next meeting
3. Identify speakers

Questions:

1. Do we want to mandate CS?
2. Who are our stakeholders?
3. What will Illinois use as standards?
4. Is higher education on board with accepting CS credits
5. Why is this important? Audience?

Task Force Plan:

1. Need to educate
2. Need to create buy-in
3. Remember purpose
4. Identify topics
 - Research
 - Best practices
 - Contact someone from Iowa, Arkansas, Rhode Island
 - Comparable states
 - Florida CS standards
 - Texas and Georgia funding
5. Look at matrix of a few states

6. Collect state data (code.org)
7. ESSA CS part of STEM – research funds
8. Google drive repository

Homework:

9. Look at data beforehand—be prepared to discuss



Illinois State Board of Education

James T. Meeks, Chairman
Tony Smith, Ph.D., State Superintendent

Illinois Computer Science Task Force Meeting Minutes

Meeting Summary by Task Force Members

Monday, March 13, 2017

1:00 p.m.–4:00 p.m.

- Illinois State Board of Education, Videoconference Room (3rd Floor), 100 N. First St., Springfield, Illinois
- Illinois State Board of Education, Videoconference Room (14th Floor), 100 W. Randolph St., Suite 14-300, Chicago, Illinois

Attendees

Task Force Members

Chicago

Jenna Garcia, Code.org
Ali Karbassi, CoderDojoChi
Brenda Wilkerson, Chicago Public Schools
Don Yanek, Chicago Teachers' Union
Wayne Bevis, Lindblom Math & Science Academy

Springfield

Steve Svetlik (chair), Computer Science Teachers Association
Austin Betz, Illinois Federation of Teachers
Jerry Weinberg, Southern Illinois University
Representative Mike Fortner, Illinois House of Representatives

Illinois State Board of Education (ISBE) Staff

Amy Cosgriff, Educator Licensure
Brian Houser, College & Career Readiness
Steve Parrott, Technology and Engineering Education
Shuwan Chiu, Data Analysis

Midwest Comprehensive Center (MWCC) Staff

Nicol Christie
Jeremy Rasmussen

Meeting Objectives

- To reach consensus on a working definition of computer science education.
- To review available state course enrollment data.
- To learn about Illinois state licensure requirements for computer science.
- To review best practices, challenges and recommendations made in other jurisdictions.

Computer Science (CS) Task Force Meeting 2

Mr. Svetlik asked whether everyone on the task force had had a chance to look at the member directory. He then asked whether the member directory will be made public.

Mr. Houser said that no, the member directory will be more for task force use, but that if they decided they would like to make the member directory public, they could do so.

Ms. Christie pointed out that the names and roles of task force members will be reflected in the meeting minutes, which will be made public.

The task force agreed to keep the directory an internal document.

The task force then went over the previous meeting's minutes and made a few minor amendments.

Mr. Karbassi asked if it was possible to get the meeting minutes on Google Drive as a Word document (as opposed to a PDF) so the task force can make comments; he was told that would not be a problem.

Mr. Svetlik made a motion to approve the minutes as amended. Mr. Betz seconded the motion.

Mr. Houser said he sent FY2015 and FY2016 school-reported data for AP computer science (CS) courses along with some of the demographic information and total number of students for the FY15 and FY16 year. He said he also sent a FY16 data piece that shows the number of teachers actively employed by school districts in the state that hold a CS endorsement. He said some of these "endorsement holders" teach high school and others teach K–8.

Shuwan Chiu explained how CS data are collected. She discussed the fact that the data are self-reported, and discussed the limitations of the data (e.g., the data only show AP CS courses).

Representative Fortner asked whether the data show how many CS sessions a school offers; he said that he assumes that schools offer more than one session throughout the academic year.

Ms. Chiu reported that it depends on the school. She said some schools have a full-term CS course where others might have a spring-term course.

Mr. Karbassi said the data seemed "rolled up" and expressed a preference for more granular data showing course ID, course name, what semester, ethnicity of students, etc.

Steve Parrott from ISBE said the data being presented are strictly for the state AP CS course, and that some courses that might be similar (e.g., a computer networking course) would not be included.

Ms. Wilkerson responded that if the task force is supposed to investigate the state of CS in Illinois, these data do not provide a complete enough picture to make that investigation easy. She asked how the task force can access data that show “CS-like” courses as well, which would be important to fully understanding the CS activity in the state.

Mr. Karbassi asked if the data source ISBE is pulling from is public, and was told that it was not publicly available (and not even to the task force). Mr. Karbassi then asked if it was possible to get a list of all the data columns available regarding CS data.

Ms. Garcia added that in order for the task force to make an educated request for useful data, it would be helpful to know what data are being tracked and therefore available.

Mr. Svetlik indicated that he had looked up the CS data at his own school and compared them to ISBE’s data and found discrepancies. He said he was curious how the data were collected and how they were being shared with schools. He then asked Mr. Yanek to check whether the CS data at his school match what ISBE has provided.

Mr. Bevis indicated that for his school, the AP numbers were slightly higher than those reflected in the ISBE data. He said since the ISBE data only show AP courses, there are many CS students not being captured at his school.

Ms. Wilkerson added that there are several CPS high schools that are not on this list that have been teaching AP Computer Science A for years.

Mr. Karbassi reiterated his question regarding whether the task force can get all possible data columns.

Ms. Chiu said that the task force can go to www.ISBE.net, where there is a scroll-down menu available that provides a student information system that might have the data the task force is looking for.

Mr. Svetlik mentioned that Barbara Ericson is known nationwide as an expert in CS for statewide data that the College Board publishes, which might be useful data to review. He indicated he would like to see data other than the AP CS data.

Ms. Wilkerson said she is excited to see data that show what is happening in the state, but cautioned that data were missing from the sample, therefore members may not have the most accurate view of what true CS course utilization looks like in the state.

Ms. Chiu reported that the ISBE data are from schools, and that all schools are required to self-report the data. She said that though there are specific guidelines for what must be included in the CS data that the schools send, there is no one checking for completeness.

Mr. Svetlik suggested that one of the task force’s recommendations should be how ISBE collects CS data to get something more trackable.

Mr. Svetlik then made the motion to recommend to the general assembly that the data collection process be reviewed to ensure that there are no gaps or interpretive data delivered from the schools to ISBE. The task force was unanimously in favor of the motion.

Mr. Karbassi suggested that the kinds of data that should be reported to ISBE should be a topic for another meeting—either by this task force or a subsequent task force.

Mr. Yanek pointed out that there are only three more meetings. He said that although the data that ISBE have provided are incomplete, there is still useful information (e.g., information showing that African-American students are being underserved in CS) that the task force can act on.

Mr. Svetlik agreed with Mr. Yanek, and reiterated his suggestion to look at the Barbara Erickson CS data that is verifiable by the College Board. Mr. Yanek pointed out that Barbara Erickson’s data are based on students who took the test, which means it is limited. Mr. Svetlik agreed, but felt that the data were another piece of the larger picture.

Ms. Wilkerson stressed the importance of acknowledging the limitations of the data. She argued that the ISBE data were definitely worth looking at, but not a strong enough basis for any definitive conclusions.

Professor Weinberg noted that there was no effort to clean up the data with the Illinois Longitudinal Data System. Ms. Chiu responded that she did not think the data were a topic in the meetings regarding the Illinois Longitudinal Data System.

Mr. Svetlik said he still wished to make a recommendation (for long-term purposes) to analyze how ISBE’s data collection process works. He asked the task force for a show of hands; all were in favor.

Mr. Pat Yongpradit from Code.org then fielded questions from the task force. He introduced himself and described his involvement in state-level CS policy and in national strategies on a number of topics, including CS standards, certification, etc.

Mr. Svetlik asked Mr. Yongpradit how Code.org defines success with regard to a state achieving expanded CS access for K-12 students.

Mr. Yongpradit replied that Code.org categorizes goals into two buckets: implementation-related goals and policy-related goals. He cited as an example of a policy-related goal adopting K-12 CS standards, or requiring that all high school at least offer CS. An example of an implementation-related goal would be establishing at least one teacher teaching CS in every single K-12 school. He said there are a number of goals, but they are all bucketed into those two main categories.

Mr. Svetlik asked Mr. Yongpradit, among the states in which he worked, whether there were any in particular that have made a commitment to funding CS. Mr. Yongpradit responded that recommendations won’t go far without funding attached to them. He said he has seen many states experiencing little success in using unfunded mandates for things like ensuring all schools at least offer CS. He said both West Virginia and New Hampshire have CS requirements without funding behind them, which has resulted in the implementation being all over the place. He said

that Arkansas is a model state. He said the Governor of Arkansas allocated \$5 million in 2016/2017 that came from discretionary funds. He said that Arizona just passed an allocation of \$200,000 for a standards training initiative that is supposed to lead to CS implementation. He mentioned that Idaho just passed funding of \$2 million for FY18 for a variety of CS standards. He went on to point out, though, that it is not just about money, but how the money is structured as well. He said he would be willing to make a chart in regard to CS and funding in many states.

Mr. Yongpradit related that Connecticut had not had any funding attached to its CS strategic planning, so the state invited people from its tech talent fund, which is a fund of \$10 million coming out of the economic development workforce. He said a commissioner from that development workforce as well industrial partners sat down with the CS Connecticut task force, which led to a state summit. He said this had created a relationship between the two bodies in which more money could be requested. He said that Illinois likely has something similar to Connecticut's tech talent fund. Mr. Yongpradit also said another state created a grant program (without money attached to it) that allows for private entities and individuals to give money toward CS.

Mr. Yongpradit then talked about the elements that make for a good CS state plan. He said having a clear vision, being holistic, identifying responsible parties, and having start and end dates are important. He said two things that are characteristic of successful state plans are: 1) when recommending funding, make sure to include other state models that have worked as examples; and 2) there needs to be a clear driver for the work to move forward – an actual position at the state education agency that can oversee and advocate for CS in the state. He said he is only aware of five states that actually have a dedicated CS position at the state level. He said getting legislators and people from the industry to the table is important in advancing CS education in the state.

Mr. Svetlik asked: 1) how can we ensure that teachers with a CS endorsement have sensible pathways to renew their endorsement? and 2) for teachers seeking a CS endorsement, how do we ensure sensible pathways for them to obtain the endorsement?

Mr. Yongpradit replied that a number of states have taken innovative approaches to certification that allow and inspire growth in CS. For example, Utah allows a teacher to teach CS after receiving one to two weeks of professional development, rather than having to take 15 credits at a university. He said Utah's approach is much more about micro-credentialing, and described Utah's three levels of CS certification:

- The first level requires a teacher to attend a workshop or online professional development
- The second level requires non-credit hours of specified coursework
- The third level entails 15 credits of specified course work

Mr. Yongpradit noted that other states that have similar CS leveling systems require teachers to move through the different levels year by year. He pointed out that this has the advantage of tracking, right from the beginning, who is teaching CS.

Ms. Wilkerson responded that micro credentialing doesn't count for anything. She argued that in order for micro-credentialing to be effective, it needs to be supported by the state, especially in terms of funding. In reply, Mr. Yongpradit said some of the states that use CS micro-credentialing offer reimbursements and some even cover the entire cost of the credits.

Mr. Parrott from ISBE asked how these other states Mr. Yongpradit has been discussing define CS. Mr. Yongpradit offered two definitions of CS:

- Computer Science Teachers Association (CSTA) and Association for Computing Machinery (ACM) define CS as the study of computers and their processes, including their principles, hardware and software design, applications, and impact on society.
- The Federal Civil Rights Database definition of CS includes computer programming and coding to create software and manipulate electronics and to manage large amounts of information. (The Federal Civil Rights Database definition of CS also includes what CS is not.)

Mr. Karbassi asked if the Federal Civil Rights Database define the kinds of data being collected. Mr. Yongpradit answered that schools have to report the number of CS classes, and the number of students taking those classes, including ethnicity information, and the number of students in the classes who are classified as having disabilities.

Ms. Wilkerson asked Mr. Yongpradit to clarify what the Federal Civil Rights Database means for the collection of data in the states. Mr. Yongpradit indicated that nothing changes right now. He said that schools have to report on these data every few years, and that the next report will be two years from now.

Mr. Yongpradit concluded by highlighting two Code.org resources that he feels are immensely helpful in helping states craft CS state plans: 1) Code.org's state planning toolkit, and 2) Code.org's CS framework.

Mr. Yanek said he endorses the idea of micro credentialing and said it is a topic worth investigating. The task force agreed.

Amy Cosgriff, Principal Consultant from ISBE then shared information on CS licensure in the state of Illinois. She said a teacher has to apply for a CS endorsement for the middle school and high school levels. She said the areas of coursework involved in attaining a CS endorsement are:

- Algorithms and data structures
- Principles and methods of computing
- Problem solving in computing
- Programming techniques
- Programming computer languages

Mr. Svetlik asked if there is a list of courses that meet the criteria of those areas; Ms. Cosgriff replied that no list currently exists and that those areas are largely interpretive. Mr. Svetlik said he knows a number of teachers in the state who are teaching CS with a mathematics

endorsement, but not a CS endorsement, which conflicts with whether a teacher needs to hold a CS endorsement to teach CS. Ms. Cosgriff replied that a lot of this comes down to assignability and major and minor teaching assignments.

Mr. Svetlik reported he has heard that there is nothing in Illinois laws and rules that states an individual qualified to teach math is qualified to teach CS. However, House Bill 3695 was passed to allow either AP CS A or AP CS principles to count toward the three requisite years of high school math graduation requirements. He said that this seems contradictory, or that it suggests that someone other than a mathematics teacher can teach a course where math credit is received. He then referenced a math class where the description says it is intended for students to obtain the objectives of computer, math, and Algebra 1–level courses that includes the study of computer systems and programming and using a computer to solve math problems. He pointed out that this description includes a lot of things that are done in CS courses. He asked what is there to stop a school from having a math teacher teaching what is essentially a CS course.

Mr. Parrott said in order to teach the class that Mr. Svetlik referenced, a teacher would need to have a CS endorsement as well as a math qualification. He reported that it is up to the ROEs and the ISCs to make sure teachers are properly licensed in terms of the classes they teach.

Mr. Yanek asked if there is a methods-course requirement for teachers wanting an endorsement in CS; Ms. Cosgriff responded no.

Mr. Yanek then asked if it would be feasible that a CS endorsement require a teaching methods course. He argued that, given the inequity in CS, it is imperative that teachers know how to teach to equity, which is not an inherent skill. Mr. Parrott said a potential problem with requiring a teaching methods course is that not all colleges or universities are able to offer such a course.

Mr. Yanek said he was assuming that if there is going to be a pathway for CS teachers in the state of Illinois then there will have to be an accompanying teaching methods course for preservice teachers. Mr. Svetlik said he agrees with Mr. Yanek’s statement, and noted that it is not necessarily about the number of credits required for a CS endorsement, but more about the kinds of classes taken.

Ms. Wilkerson expressed concern about the potential for the task force to just go through the motions and ultimately offer up something that really doesn’t solve the problem—the lack of CS being taught equitably across the state. She emphasized that the task force needs to make sure that the CS credential meets the requirements of CS as it exists now and into the short-term future.

Responding to Mr. Yanek’s perspective, Mr. Svetlik said the task force could potentially make the following recommendation: instructors that are able to teach a CS methods course be made available to post-secondary institutions that do not already offer such a course.

Professor Weinberg agreed that teaching equity is important, but felt that it speaks more to keeping CS interest and building the pipeline. He noted that you still have to build that pipeline and the cultural attitudes that move it forward, whether it be for women or minorities. He said

the numbers the data reveal are not because students entered and then dropped out; they are because the students never took the class in the first place.

Ms. Wilkerson pointed out that the task force does not have knowledge of what schools are actually offering in classes that have CS course codes. She argued that it would be useful to capture these data and be able to analyze them at some point to be able to see what is really being offered in terms of CS—especially regarding the CS courses other than AP CS. She added that another thing to consider is how the task force could offer another layer of CS than what exists now.

Mr. Parrott asked if Ms. Wilkerson could share what CPS considers a CS course. He reported he has heard that some of CPS’s CTE courses are being allowed to double as a CS course. Ms. Wilkerson responded that CPS had to shoehorn courses into the sparse framework that existed around technology courses, which had to do with funding. She said these CS courses are labeled CTE because that’s where the funding is. Ms. Wilkerson went on to say that many schools have done what they needed to do to get CS to their students. She stressed that in order for this task force to know what is happening in Illinois around CS, they need to know how those schools are making that happen given the current restraints.

Mr. Yanek said that his hometown high school offer two CS courses, but has no teachers with a CS endorsement; it seems this school has figured out a way to offer CS in the absence of a teacher with an endorsement. Ms. Garcia expressed a desire that there be no negative retribution for schools finding ways around the current restraints in the state to offer CS.

Mr. Svetlik asked, if the question is what has worked, and where in the state CS is available, whether that should be the focal point for the next meeting. He then opened the floor for public comment; there were no public comments.

Mr. Svetlik said he would like to have a concrete definition of CS before the meeting ends. Mr. Yanek suggested, since there wasn’t much time left, to instead agree on a working definition that will be a starting point, with the understanding that it will change as the task force accumulates information.

Mr. Yanek went over the CS definition from *Stuck in the Shallow End*, which used the same definition from the ACM framework, but also included a blurb from Stanford that is relatively basic: “CS is the science of solving problems with the aid of a computer.” He also cited the paper *Computational Thinking* by Jeannette Wing, which brings up a lot of other ideas in terms of what CS is. He then referenced Henry Walker, a CS professor at Grinnell, who conducted an experiment that showed how two different names for the exact same CS course can attract different groups of students (i.e., one course name appealed to more women than men). He said that sometimes course names and descriptions get too technical and can scare prospective students away. He said when coming up with or modifying a CS definition, they need to make sure to use non-technical language. Mr. Yanek said he likes the idea of having a definition that revolves around the use of a computer as a problem-solving tool, but worries that this might be too broad.

Mr. Svetlik asked how the task force can get a multitude of stakeholders involved in the conversation, and said he sees getting stakeholders involved as a meaningful task for the task force. Mr. Yanek said that maybe a good homework assignment would be to give the ACM task force definition of CS to the task force members' spouses, parents, and neighbors and ask them what they think it means. Mr. Karbassi suggested putting the ACM task force definition out on members' social media networks for feedback.

Mr. Bevis said that one thing he notices as lacking in that definition is the collaborative nature of CS. There was, for the most part, agreement regarding Mr. Bevis's point.

Mr. Svetlik asked whether, for the meantime, the task force agrees to use the ACM task force definition as a working definition.

Mr. Houser asked the task force to consider, when defining CS, whether or not the intention is that everything included in the definition has to be accomplished in the CS course.

Professor Weinberg pointed out the importance of the application side—courses focused purely on web design should not fall under CS. He then asked if the definition has to be concise and simple, or if there could be tiers to it. Mr. Karbassi suggested making a long description of CS for things like classes and policy makers, as well as a short description that gets kids in the door. Mr. Svetlik said his gut reaction is less is more, but doesn't want something so narrow that they are boxed in—there has to be a happy medium. Ms. Garcia argued that it was important to also add, in the longer CS definition, what is not CS.

Mr. Svetlik asked if it was a reasonable goal for the next meeting that the task force crowdsource a definition of CS. Mr. Karbassi said that if all of the members pushed a one-item Google survey asking "what is CS to you?" out to all of their social networks, they would garner a good variety of definitions. The task force agreed that this was a good idea.

Mr. Svetlik asked that the task force to collectively research state CS licensure models, particularly that of Utah. He also proposed the creation of a CS summit that would involve industry stakeholders. Ms. Wilkerson said CPS had held a CS summit this past summer and that a white paper from STEMConnector should be coming out shortly.

There was a discussion about expanding the number of meetings of the CS Task Force; this would have to be approved by ISBE, which is unlikely due to the time constraints for the legislated task force meetings.

Meeting adjourned at 4:05.



Illinois State Board of Education

James T. Meeks, Chairman
Tony Smith, Ph.D., State Superintendent

Illinois Computer Science Education Task Force Meeting Minutes

Meeting Summary by Task Force Members

Monday, April 10, 2017

1:00 p.m.–3:30 p.m.

Webinar: <https://attendee.gotowebinar.com/recording/5360145955620068609>

Attendees

Task Force Members

Jenna Garcia, Code.org

Ali Karbassi, CoderDojoChi

Steve Svetlik (chair), Computer Science Teachers Association

Jerry Weinberg, Southern Illinois University

Brenda Wilkerson, Chicago Public Schools

Don Yanek, Chicago Teachers' Union

Illinois State Board of Education (ISBE) Staff

Brian Houser, Principal Consultant, College and Career Readiness

Midwest Comprehensive Center (MWCC) Staff

Nicol Christie

Jeremy Rasmussen

Meeting Objectives

To review draft recommendations

Computer Science (CS) Task Force Meeting 3

Shortly after 1 pm Central Time, Mr. Steve Svetlik, chair of the task force, called the meeting to order. Mr. Svetlik gave a brief background concerning the recommendations that he drafted. He said that the recommendations were an attempt to synthesize feedback from the task force and information found within the Code.org state planning toolkit. Mr. Svetlik said that the primary goal for the meeting should be to review these recommendations. An electronic version of the draft recommendations was displayed on the screen for webinar participants to review.

Mr. Svetlik stated that the recommendations were drafted largely from the conversations of the task force during previous meetings.

Mr. Houser added that he wanted today's meeting to be an open discussion and reminded the task force that they would not be voting on anything today because there were not enough task force members present for a quorum.

Recommendations 1 and 2: Operationalized definition of computer science (CS)/mission statement

Mr. Svetlik said that the task force needs a definition of *computer science* that is actionable and accessible for a variety of audiences (administrators, postsecondary CS instructors, industry professionals, etc.). He stated that he would first like to decide whether the task force agreed on this definition and if it can be used by licensure to determine what constitutes CS. Mr. Svetlik asked the task force how they felt about putting forth an operationalized definition of CS to the general assembly.

Mr. Yanek suggested that the task force should come up with a mission statement separate from the CS definition that can cover aspects such as equity, access for underrepresented groups, and the belief that CS goes beyond coding.

There was unanimous agreement from the task force that Mr. Yanek's suggestion was a good one.

Ms. Garcia said that a good jumping-off point for crafting a mission statement could be the original charge of the task force.

Mr. Svetlik asked if anyone on the task force felt that a mission statement would supplant a CS definition.

Dr. Weinberg said that he did not think that a mission statement should supplant a CS definition. One thing he felt was important to identify in a CS definition is what comprises and what does not comprise CS.

Mr. Houser shared the process for how the final task force report will be submitted to the Illinois General Assembly, which may then be turned into legislation that ISBE will implement. He

stated that a CS definition would help the state clarify what CS is and what it is not and will aid the state in implementing any bill that is passed by the General Assembly. It is therefore important to iron out major points. He said that the state is excited about the recommendations and looks forward to enacting them

Recommendation 3: Operation of CS definition has an explicit emphasis on the need for equitable access

Mr. Svetlik said that he felt there needed to be something explicitly called out in regard to the need for equitable access to CS education in all Illinois K–12 public schools for underrepresented groups (African Americans, Latinx, female gender identified, and/or students with identified learning differences).

The task force unanimously thought that this was a good recommendation. It was also agreed that it needs to be clear what is meant by “equitable access”.

Mr. Yanek suggested adding English language learners and students with disabilities.

Recommendation 4: Funding to maintain state-level office of CS education

Mr. Svetlik said that this recommendation focuses on the idea of funding and creating an office of CS education. The intent behind this recommendation is that ISBE, through the general assembly, would be funded to maintain the position, which would be permanent. He said that this office would not have to be a single person’s office but could include both data crunchers and liaisons. Part of the work of this office would be the ongoing analysis of data that reflects where CS is growing and where it is not, etc.

Ms. Wilkerson said that states that have gotten further than Illinois (in terms of CS education) have all had some type of CS state-level office.

Dr. Weinberg said that one of the reasons CS is underrepresented in the state is the cultural change and acceptance of going into CS. He asked if it would be too much to expand Recommendation 4 by stating that such an office would also be supportive of research and practices that advocate for the diversification of CS.

There was unanimous agreement that research and practices that support the diversification of CS should be underscored in the recommendations.

Ms. Wilkerson suggested that language in this recommendation reflect that this office be solely for CS and not combined with some other office.

Mr. Svetlik said that given the fiscal climate in Illinois, one point of concern with some of these recommendations is that they may be perceived by the General Assembly as too bold.

Ms. Wilkerson said that this recommendation (4) talks about the collection of course enrollment data. She said that there is a lot happening in CS right now that is not being collected.

Ms. Wilkerson said that if this recommendation changes how and what the state collects in terms

of CS data, then that becomes really important. She would like the data piece to be reflected to a greater degree within this recommendation.

Mr. Svetlik said that he would add to this recommendation the shoring up of the process by which data is collected.

Recommendation 5: Illinois CS licensure

Mr. Svetlik said that with recommendation 5, he tried to capture a sense of what other states have done, along with a few thoughts that had been brought up in previous meetings about a methods course. He believed that all CS teachers should have some sort of formalized, researched-based, well-defined method of teaching CS. Mr. Svetlik said that his recommendation promotes a tiered system of licensure that aligns itself with how CS is defined by the task force.

Ms. Wilkerson asked if there was any language in this recommendation around reciprocity from other states.

Mr. Svetlik said that there is not and that reciprocity is a good point and it should be included in task force recommendations

Ms. Wilkerson said that maybe it should be the job of the new CS state office to analyze other state credentials for possible reciprocity agreements.

Mr. Svetlik said that it was his belief that a well-designed method of teaching CS courses that focuses on equitable teaching strategies should replace the CS credential exam.

Mr. Yanek said that he agreed that a methods course is extremely valuable for all CS teacher candidates but was wondering about the legal challenges of mandating such a course.

Mr. Houser said that he did not believe that there was a legal issue and that if it is a recommendation that the general assembly agrees with, then it could move forward.

Ms. Garcia asked Mr. Svetlik if he had a specific reason for wanting to get rid of the CS licensure test as opposed to making it an alternative option to taking the CS methods course.

Mr. Svetlik said that it is mainly because he does not know what content is included on the test. He said he has a fear that if Illinois keeps the test as it currently is, then it is going to be another 10 years before the test is updated again. He said that he is not married to the idea of one replacing the other.

Dr. Weinberg asked Mr. Houser how much bottleneck there is with taking the CS licensure test. He said that he knows a couple of teachers who have said that it takes a long time to get the test taken or graded.

Mr. Houser said that he was unaware of any bottleneck issue with the CS licensure test and that this might be a question for the licensing department. He said that he would check on the reciprocity regulations for teachers from other states.

Ms. Garcia shared that she did not receive reciprocity for her teaching endorsement from New York state when she transferred to Illinois.

Mr. Yanek said that not all methods courses are the same and that he worries that such a course might be more focused on the mechanics of teaching than on equity. He suggested that the methods course meet certain requirements.

Mr. Svetlik said that the task force could, in a future meeting, come up with criteria for a methods course that are consistent with the task force's vision.

Mr. Yanek said that he had a question about limited endorsement. He asked if preservice teachers would have a path to a limited endorsement or if there is only the option of full endorsement.

Mr. Svetlik said that he believes a preservice teacher would have limited endorsement as an option.

Mr. Yanek also wondered if there would be a problem, down the road, where there were too many teachers with a limited CS endorsement and not enough with a full endorsement (Would a limited endorsement dissuade teachers from going for the full endorsement?).

Ms. Wilkerson said that from her perspective, a tiered approach to licensure is the right way to go. She said that the option of a teacher being able to teach for a while with a limited endorsement and always being able to go back for the full endorsement would be appealing to many.

Mr. Svetlik said that the requirement in Illinois for the CS endorsement right now feels arbitrary with very little about best practices. He said that it might come down to strategically thinking through what courses provide the best value in the terms of best practices for the time.

Mr. Svetlik said that there are conflicting needs that a teacher comes in with—for example, a strong background in content and pedagogy. At the same time, if teachers already have some experience, that should be honored, too. He said that whatever the task force says should be a requirement for teachers, there should also be some kind of financial incentive to lessen the burden. He said that you cannot grow the pipeline if you make it too expensive.

Ms. Garcia asked if a precedent such as offering financial incentive has ever been set with other certifications or endorsements.

Mr. Svetlik said that he did not know for certain but guessed that a precedent had not been set.

Mr. Houser said that he is not aware of anything specific to this approach, although there has been a lot of talk across all content areas concerning teacher shortages and ways to incentivize teachers to remain teachers, as well as growing the teacher pipeline.

Ms. Garcia said that she loves the idea but is worried that it might be asking for too much. She said that she does not want the recommendations to be put on a shelf and never looked at again.

Ms. Garcia wondered if they could find a thought partner (perhaps at ISBE or state level) that could provide guidance regarding this recommendation.

Dr. Weinberg asked if there was any way to convey that partnerships with industry might be supportive in helping with costs.

Mr. Svetlik said that he saw no reason why not. A combination of citing industry support and acknowledgment that there are other states out there that have done things similar to this recommendation and naming those specific states would further the likelihood of consideration by the general assembly.

Mr. Karbassi was wondering about the language around offering reimbursement for tuition (in the context of teachers going for a CS endorsement). He asked if there is a limit on this reimbursement. He said that if they set the amount of funds in the language, it could help make it more digestible to the general assembly.

Ms. Wilkerson said that she thinks the set amount should be tied to the number of teachers the state needs to do this work and that they should be able to count the number of schools and do some sort of estimate of the CS teachers needed versus the number the state has now.

Dr. Weinberg said that the task force should convey in the language that this recommendation will be equitable across the state.

Ms. Wilkerson said that one worry she has about this conversation is that it does not take into account the movement of teachers, which might affect the equitable distribution of dollars.

Dr. Weinberg clarified that he was talking about the equitable distribution of the teachers and not specifically the dollars.

The group agreed that whatever endorsement exam is given that it should include pedagogy built into it.

Recommendation 6: Annual analysis of CS courses in course book

Mr. Svetlik said that it might be a good idea to have an advisory board that would be part of an annual analysis of CS courses in the course book—a board that would be comprised of a set of stakeholders.

There was unanimous agreement around this recommendation.

Recommendation 7: Removing AP Computer Science AB from the ISBE secondary course catalog

Mr. Houser said that for FY 18, AP CS AB has been removed from the ISBE course catalog.

Dr. Weinberg said that as to the Illinois licensure and endorsement requirements, he wondered if they should comment on things that are currently in the requirements and make recommendations on other courses as well that may need to be updated. For example, there is a

computer applications course that has the phrase “and all computer science” in it. He said that he thinks that particular language needs to be taken out of the CS applications endorsement. Mr. Svetlik said that he agrees.

Mr. Houser said that changing language and course descriptions is perfect for the recommended CS office to do and clean up. He said that this activity might not need to be its own recommendation but more of a side note of a minor change that needs to happen.

Mr. Svetlik reviewed the members’ homework assignments and summarized next steps, which included identifying resources and evidence that support or provide context to the task force recommendations.

Meeting adjourned at 3:30 p.m. There were no guests present for public comment.



Illinois State Board of Education

James T. Meeks, Chairman

Tony Smith, Ph.D., State Superintendent

Illinois Computer Science Education Task Force Meeting Minutes

Meeting Summary by Task Force Members

Monday, April 17, 2017

1:00 p.m.–4:00 p.m.

- Illinois State Board of Education, Videoconference Room (3rd Floor), 100 N. First St., Springfield, Illinois
- Illinois State Board of Education, Videoconference Room (14th Floor), 100 W. Randolph St., Suite 14-300, Chicago, Illinois

Attendees

Task Force Members

Chicago

Jenna Garcia, Code.org

Ali Karbassi, CoderDojoChi

Steve Svetlik (chair), Computer Science Teachers Association

Brenda Wilkerson, Chicago Public Schools

Mike Fortner, Representative 95th District

Springfield

Randy Swikle, Illinois Press Association

Called in

Austin Betz, Illinois Federation of Teachers

Jerry Weinberg, Southern Illinois University

Illinois State Board of Education (ISBE) Staff

Brian Houser

Midwest Comprehensive Center (MWCC) Staff

Nicol Christie

Jeremy Rasmussen

Meeting Objectives

- Reach consensus on a working definition of computer science education.
- Reach consensus on at least three draft recommendations.

Mr. Svetlik called the meeting to order. He reviewed meeting objectives, stating that the primary goal was to formalize, by vote, the Task Force’s stance on each recommendation. He noted that the recommendations would remain in draft form until the very last meeting. He said the Task Force also has to begin to formulate an operationalized definition of *computer science* (CS).

State Representative Mike Fortner provided guidance on how to prepare a useful report for the General Assembly. He said that, when it comes to the recommendations, to the extent possible, the Task Force should strive to distinguish between aspects of the recommendations that will require statutory changes, and aspects that will require changes to the rules by which the state agency operates. He also noted that recommendations should be stated succinctly and have supporting evidence and background.

The Task Force then reviewed the minutes from the March 13 and April 10 meetings. After reviewing the meeting minutes, Mr. Svetlik motioned to approve the March 13 minutes, Ms. Jenna Garcia seconded, and all approved; no one abstained. Mr. Svetlik then motioned to accept the April 10 meeting minutes as amended, Mr. Ali Karbassi seconded, and all approved; no one abstained.

Review of Items and Recommendations

Mr. Svetlik opened a discussion about the operationalized definition. He said that it would be used by state licensure officials, principals, school administrators, district administrators, legislators, and parents. It needed to be something accessible to all stakeholders. Mr. Svetlik suggested that Task Force members share their individual CS definitions on the basis of their completed Google form, which they had been asked to complete prior to the meeting.

Ms. Brenda Wilkerson said that her definition emphasizes computational design to solve problems and to automate processes. She added that her definition also includes the study of the design of processes used to solve a problem or automate a process to be executed by a computational device, such as programming, algorithms, hardware, software, and systems design, among others.

Mr. Karbassi’s definition made the point that CS is the study of all kinds of computers as well as their impact and how they are used in everyday life. He said that, for him, the way CS affects lives is a critical component of the definition.

Mr. Austin Betz said that he believed the focus of the definition should be on solving problems by means of computers. He said that his definition excluded things like creating computer documents (in Word, spreadsheets, etc.) and included algorithms, data structures, and software development. He agreed with Mr. Karbassi that the social impact of CS is important.

Mr. Svetlik’s definition came verbatim from the CS K–12 framework. He said that the CS K–12 framework document discusses what is and is not CS. He said the authors of that document deemed computer literacy to be nonequivalent to CS as well as digital citizenship and

information technology. He said that CS is not about the consumption of technology; it is really about the processes, algorithms, and technologies that ultimately give rise to new creations.

Representative Fortner said it sounded as if Mr. Svetlik was saying that parts of information technology (i.e., the way data are packaged and distributed) are not themselves CS.

Mr. Svetlik responded that CS and information technology, in his opinion, are not synonymous.

Representative Fortner said he believed that digital citizenship and information technology are more dissimilar than information technology is from CS.

Ms. Wilkerson said she took issue with the CS K–12 framework because it lumps digital citizenship, computer literacy, and information technology together, even though information technology is further removed from the first two.

Representative Fortner said that much information technology does not relate to the broad-based learning of digital citizenship and computer literacy. He said that information technology is more career- and subject-specific, and that information science and CS are tightly bound even at the college and university levels.

Mr. Svetlik replied that even things that CS does not encompass deserve a place somewhere in the K–12 curriculum. However, if the Task Force wants to clarify what CS is and is not, then it will need a much more granular definition.

Representative Fortner said he just wanted to make sure that information technology is parked somewhere and is not left out, like computer literacy.

Mr. Karbassi stated that no one had talked about the difference between software engineering and CS. He asked whether the Task Force wanted to talk about that.

Ms. Garcia said she was concerned that they were listing out all the consumers of this definition of CS. She said there is a huge disconnect between a K–12 definition of CS and a secondary education definition of CS. And when you add parents, guardians, and so on, the disconnect might be even greater.

Ms. Wilkerson said she felt that the rise of CS has usurped what used to be called information technology and that is something the Task Force will have to address.

Representative Fortner's observation of the field was that, historically, the academic discipline was called CS and the career that evolved from it was called information technology. For a while, the same professionals were exercising the same skills.

Mr. Karbassi suggested that it might be wise for the definition of CS to have three levels: (a) a thorough description of what CS is and is not, (b) a shorter definition, and (c) and a brief definition for people who are unfamiliar with the field.

Ms. Wilkerson wondered whether this is achievable, given the difficulty of this task.

Representative Fortner said that it might be helpful not to rely on black-and-white descriptors. He suggested using phrasing like, “CS is *primarily* and is *not primarily*; thus, things related to CS (but that are not primarily CS) would not be definitively excluded.

Mr. Svetlik said that the field of CS has existed for only 40 to 50 years, largely as a niche area of study. He said that, if you were to ask an academic who teaches mathematics at the postsecondary level what they think mathematics is, the response would differ dramatically from a high school math teacher’s. He said that he believed that this Task Force would not come up with a definitive definition of CS. He said that we can say that learning about CS does have the potential by-product of helping students become more computer literate, or better typists, and so forth. He said that the Task Force could not progress with the work it is doing when there is a business marketing and computer education endorsement, business marketing and computer programming endorsement, a computer applications endorsement, and a CS endorsement. He stated that merely naming those four distinct areas exemplified the kind of confusion created by not having had this conversation (defining CS) previously within the local CS community.

It was suggested that the Task Force start listing key words for the definition of CS (i.e., what it is and what it is not).

Mr. Karbassi said he was concerned about taking this approach. For example, a CS programming class might have a component of computer literacy that could be removed or left out because computer literacy falls outside CS.

Representative Fortner reiterated that Mr. Karbassi’s concern was the reason he favored using terms such as *primarily*.

Mr. Svetlik then read the revised recommendation for a definition of CS:

“There shall be established a formalized and operationalized definition of CS to be adopted by ISBE inclusive of both what primarily constitutes CS and what is not primarily synonymous with CS.”

Mr. Svetlik said that, if the CS office recommended by the Task Force was to be established, it would know how to negotiate the conversations to achieve the recommended definition of CS.

Mr. Svetlik then asked the Task Force for key words.

Mr. Betz suggested automation of processes, problem solving, algorithms, software development, hardware design, hardware development, impact on society, and some mention of type of device—not only computers.

Dr. Jerry Weinberg suggested that the Task Force be careful with how the term *automation of processes* is used. He said that, unless you have a broader image of the word *process*, it discounts all human interactions with computers.

Mr. Karbassi asked whether the Task Force should define algorithms. He said that math has algorithms, too.

Mr. Svetlik suggested algorithmic thinking and that they add the word *creative* as well.

Representative Fortner said that the Association for Computing Machinery (ACM) lists 18 pieces that compose CS, which he read from the website, as follows:

- Algorithms and complexity
- Architecture and organization
- Computational science
- Discrete structures
- Graphics and visualization
- Human computer interaction
- Information assurance and security
- Information management
- Intelligent systems
- Networking and communications
- Operating systems
- Platform-based development
- Parallel and distributed computing
- Programming languages
- Software development fundamentals
- Software engineering
- Systems fundamentals
- Social issues and professional practice

Ms. Garcia mentioned that the Task Force should ensure that the preface to the recommendations report state that not all 18 of these elements had to fit into one course.

Mr. Svetlik then asked for key terms regarding what is *not* primarily synonymous with CS.

Mr. Karbassi said that digital literacy, digital citizenship, data entry, web design, and use of digital tools (i.e., using a camera) are not CS.

Ms. Wilkerson said that office application skills (Microsoft Office, Excel, etc.) and the use of various digital media are not CS.

Ms. Garcia suggested using the term *consumption of digital media* instead of *the use of*.

Mr. Svetlik then asked Mr. Randy Swikle for his input.

Mr. Swikle said that he found the conversation very interesting, especially because he is a layperson when it comes to CS. He said that his focus is more on the ethical use of computers and that he was hoping the definition of CS would somehow address the ethical use of computers, especially in regard to how students use them.

Mr. Svetlik said that the ethical use of CS sometimes is added to consideration of the societal impact of CS, but that it is important to acknowledge and recognize the ethical use of computing as a standalone issue.

Mr. Svetlik then asked whether the Task Force could vote on a motion to use the following language as a starting point for the definition of CS:

“There shall be established a formalized and operationalized definition of CS to be adopted by ISBE inclusive of both what primarily constitutes CS and what is it not primarily synonymous with CS. The definition should be digestible to all stakeholder groups including specifically, but not limited to: parents and guardians, K–12 CS teachers and school administrators, any member of the CS postsecondary community, and industry professionals. This definition should therefore be written in language that is accessible to all stakeholder groups to ensure that the definition may be applicable toward the achievement of the other recommendations stated here.”

Mr. Svetlik said that this recommendation also includes Part A (the Task Force recommends that the CS definition be as follows), which, currently, is in the form of a list of what CS is and is not.

Ms. Wilkerson suggested that the Task Force cite the ACM website as the source of the items listed as part of defining CS.

Mr. Brian Houser suggested delaying the vote on this draft definition of CS and instead trying to reach agreement within the Task Force that this would be the working draft definition. All agreed.

Mr. Svetlik discussed the idea of a CS mission statement (i.e., a set of beliefs). He shared an example of the Arkansas CS Task Force report to inform the development of a mission statement. Mr. Svetlik said that perhaps the next meeting should focus on crafting a set of beliefs.

Mr. Svetlik moved the discussion on to Item 3, which calls for equitable access to CS. He said that the notion of CS and equity is highly adoptable.

Mr. Houser said this recommendation would benefit from identifying modes of providing equitable access (i.e., virtual education).

Representative Fortner agreed with Mr. Houser. He said that Recommendation 3, in its current form, is not actionable.

Dr. Weinberg said that this speaks to his suggestion to provide funding in a way that ensures that CS teachers or resources are equitably distributed across the state.

Representative Fortner proposed that the recommendation read as follows: “The Task Force recommends that the state board of education design its CS program in a manner that specifically addresses underserved populations.”

Ms. Wilkerson asked whether the Task Force could add low-income to the list of underserved students.

Mr. Svetlik said yes.

Mr. Svetlik then mentioned that Item 4 also highlights equity and he reviewed the portion where equity is mentioned:

“The Principal Consultant of Computer Science Education shall work directly with the Office of the State Superintendent of Education to ensure that all students have equitable access to the highest quality research-based Computer Science education possible.”

Mr. Svetlik said that the most important thing about this recommendation is that there would be ongoing funding exclusively for the Principal Consultant of Computer Science Education position.

Mr. Svetlik then motioned to adopt Recommendation 4 as currently written. All Task Force member voted yes, except for Representative Fortner, who abstained.

For item 1, Representative Fortner suggested distinguishing actionable recommendations from findings that support the recommendations. He said that the portion of the recommendation covering what is and is not CS might be better placed under a findings section that would immediately follow the actionable recommendation.

Mr. Svetlik suggested taking the first sentence from Recommendation 1 and adopting it as the recommendation:

“There shall be established a formalized and operationalized definition of CS to be adopted by ISBE inclusive of both what primarily constitutes CS and what is it not primarily synonymous with CS.”

Citing the Google document, Ms. Garcia said that she believed that everything before Part A could be used as the recommendation, which would read as follows:

“There shall be established a formalized and operationalized definition of CS to be adopted by ISBE inclusive of both what primarily constitutes CS and what is it not primarily synonymous with CS. The definition should be digestible to all Illinois stakeholder groups including specifically, but not limited to, parents and guardians, K–12 CS teachers and school administrators, any member of the CS postsecondary community, and industry professionals. This definition should therefore be written in language that is accessible to all stakeholder groups to ensure that the definition may be applicable toward the achievement of the other recommendations stated here.”

Mr. Svetlik agreed and then motioned to adopt everything up to Part A as the recommendation. Mr. Betz seconded. All Task Force member voted yes except for Representative Fortner, who abstained.

The Task Force then moved on to Item 5, which Mr. Svetlik read aloud:

“The Illinois State Board of Education shall revise the process by which they collect course enrollment data to ensure the public has timely access to accurate, detailed, and informative Computer Science enrollment data to measure ongoing statewide progress towards successful implementation of ‘CS for ALL’ across all of Illinois. Such data shall be shared with the Office of Computer Science Education, as defined above, for the purpose of measuring progress across all regions of Illinois and among all demographic groups therein toward supporting all schools’

growth in expanding access to Computer Science Education. Particular emphasis shall be devoted to those schools with demonstrated need for increased fiscal/personnel support so as to further our collective mission of providing every student in Illinois with high-quality Computer Science Education.”

Mr. Karbassi asked whether the Task Force should define the collection of enrollment data.

Representative Fortner said that a definition of the collection of enrollment data could potentially go in a findings section.

Mr. Svetlik then motioned for this to be adopted as a recommendation. Ms. Garcia seconded. All Task Force members voted yes except for Representative Fortner, who abstained.

It was suggested that Item 6 be discussed at the next meeting.

Representative Fortner suggested organizing Item 6 similarly to Item 1 because of its length: actionable recommendation followed by evidence section.

Dr. Weinberg suggested that the Task Force think about adding as a new recommendation how CS classes would count toward graduation requirements.

Public Comment

Mr. Svetlik opened the floor for public comment. There was one guest, Kim Jablonski of Maine207 School District. She shared with the Task Force that, in her role as a department chair, she deals with the operationalized definition of CS and the ramifications that a CS definition can have on a daily basis. She said that, as new and innovative CS courses emerge, it is becoming increasingly difficult to align the various teacher endorsements with state course code. She said that her school currently offers CS programming and CS courses, and the semantics of naming can make things difficult. She reported being encouraged, realizing that there might be relief for schools trying to increase CS enrollment, although she said that if she could increase CS enrollment to the levels she would like to see, she would run out of qualified CS teachers. There is no incentive for veteran teachers already at the top of the pay scale to take 24 credit hours to attain a CS endorsement.

Mr. Svetlik said that there will soon be an option for licensure called a *short-term authorization* for positions that would otherwise go unfilled. He said that this approval would be valid for 3 years and would allow educators who are not fully qualified for an endorsement to teach if they had taken 9 semester hours of content course work. He said this endorsement included CS.

Ms. Jablonski said that this sounded like a helpful short-term solution. She said that, as schools move toward career pathway models, she encourages the Task Force to look at different definitions (of CS) in that context (i.e., career pathways) as well.

The meeting was adjourned at 4:00 p.m.



Illinois State Board of Education

James T. Meeks, Chairman
Tony Smith, Ph.D., State Superintendent

Illinois Computer Science Education Task Force

1:00 p.m.–4:00 p.m. Central Time

Monday, May 5, 2017

- Illinois State Board of Education, Webinar Room (4th Floor), 100 North First St., Springfield, Illinois
- Live Webinar: <https://attendee.gotowebinar.com/register/8630712561654604547>
- After registering, you will receive a confirmation email containing information about joining the webinar. View System Requirements

Meeting Objectives

1. To discuss and reach consensus on draft recommendations.
2. To discuss and reach consensus on a definition of “computer science education”.

Agenda

| | |
|-----------------|---|
| 12:45–1:00 p.m. | Sign In |
| 1:00–1:15 p.m. | Call to Order: Welcome, Introductions and Meeting Overview |
| 1:15–1:30 p.m. | Review and Approval of April 17 th Meeting Minutes |
| 1:30–3:30 p.m. | Member Discussion: Recommendations |
| 3:30–3:40 p.m. | Homework Assignments and Next Steps |
| 3:40–4:00 p.m. | Public Comment |
| 4:00 p.m. | Adjourn |

Meeting Minutes May 5th CS Taskforce Meeting Minutes

1:00 pm – 4:00 pm Central Time

Attendance:

Jerry Weinberg

Randy Swikle

Rep Fortner

Katie Hendrickson

Ali Karbassi

Steve Svetlik

Mr. Svetlik said the focus of this meeting is to try and reach consensus on as many of the draft recommendations as possible. Mr. Svetlik started the conversation with part five: recommendations to the general assembly. He said he would like each person on the taskforce

available to take one of the seven recommendations and add applicable resources and word smith the language.

Ms. Hendrickson suggested having a quick outline of part five prior to other parts just so the recommendations are front and center.

Dr. Weinberg asked if there will be an executive summary.

Mr. Svetlik said there would be an overview/summary that would describe the need, build the case, and also give a high level synopsis of the recommendations. Mr. Svetlik said he was also thinking about a background on the formation of the taskforce and providing a view on the current state of CS in Illinois.

Mr. Swikle said it would help him to take a look at some porotypes of what a final product of the report would possibly look like. He said he has been working on gathering information on CS ethics. A prototype report would help him see how the ethics part fits.

Mr. Svetlik gave Randy directions on how to access the Arkansas CS taskforce report.

Mr. Svetlik said he talked to a few taskforce members and there was mention that instead of having a definition of CS the taskforce should define what CS education should look like in IL.

Mr. Karbassi and Dr. Weinberg agree.

Mr. Svetlik asked rep Fortner if bullet 2 of part 2 (current accuracy of datasets) could translate into a recommendation in part five.

Rep Fortner said if bullet two of part lacks direction in its current form. He said he like Mr. Svetlik's sense that these are findings, but they need to have a feel of a finding.

For bullet two of part two, Rep Fortner suggested adding the word "incomplete" to give it a sense that it is a finding.

Mr. Svetlik then asked the taskforce if bullet 3 of part two (current teacher licensure and endorsement procedures) need to be included in the findings.

Mr. Karbassi said yes

Rep Fortner said he would just add at the beginning of the sentence (bullet 3 of part two) 'the need for' and omit the word 'current' and replace it with 'revised.'

Dr. Weinberg asked does this cover both preservice and in-service.

Mr. Svetlik said yes.

Ms. Hendrickson suggested instead of the words 'revised' or 'updated' they could use 'clear' and 'obtainable', though she said words like 'revised' or 'updated' are fine if they wanted to keep it a little more vague.

Mr. Svetlik asked Katie if she is aware of any states where there is a four year CS program with a license.

Ms. Hendrickson said those types of programs are rare. According to data, there have been 51 individuals that graduated in 2015 prepared to teach CS education.

Mr. Svetlik said he would like to see a primary licensure in Illinois in CS education. He asked the taskforce for their opinions on this matter.

Ms. Hendrickson completely agreed.

The taskforce then moved onto bullet four of part 2 (CS accessibility for underrepresented groups), which Mr. Svetlik said needs to be improved.

Dr. Weinberg said there was brief discussion about defining how CS courses count toward graduation. He said a clear requirement toward graduation not only might impact whether a student has access to it, but whether they will take advantage of the availability.

The taskforce then moved onto bullet 5 of part 2 (rigorous and engaging CS education access across all K-12 schools). He asked in this bullet was redundant with any of previously discussed bullets.

Dr. Weinberg suggested adding something to the effect of curriculum that is aligned with current research in underrepresented populations in CS.

Mr. Svetlik said research is a big component to the recommendation for the office of CS education. He said he sees rationale for adding it in either the office of CS education bullet or this one (bullet 5 of part 2).

The taskforce then moved onto bullet 6 of part 2 (impact of the above (bullets) on CS accessibility for historically underrepresented groups). Mr. Svetlik said he thinks this bullet is redundant and omitted it.

Mr. Svetlik said Ms. Wilkerson had mentioned that one of the major contributors leading to the success of CPS's CS for all was through involving a variety of stakeholder groups and being purposeful of why CS is important. He also said there is a lack of understanding amongst principles on what CS is. Mr. Svetlik then offered the following as a finding: 'The lack of engagement of all stakeholder groups and the need for CS to be offered in every K-12 school.'

Mr. Swikle said there may be some stakeholder groups that primarily focus on that need. He the word 'all' might need some type of a qualifier. He suggested 'the need exists to enhance the engagement of all stakeholder groups to realize the need and importance of CS K-12 education.'

Ms. Hendrickson really liked the wording 'need to enhance.'

The taskforce then moved onto to part 3: taskforce charge #2 (State of CS Education in Other Jurisdictions).

Mr. Svetlik said, for part 3, a comparative analysis between what we have already identified in each of the paragraphs represented by the prior bullet points as well as success stories from Arkansas, Iowa, and Texas. He asked that taskforce if there was a desire to keep part three or strike it from the report.

Mr. Swikle said he doesn't think it should be stricken, but that it would give some additional context to the work the state is doing.

Rep Fortner said it seems that part 3 should include both charge 2 and 3. Both charges deal with work in other jurisdictions. One is to analyze current CS education laws and the other one is to identify CS best practices. He said those two could be put together in one section. He recommended, to the extent possible, the analysis of other jurisdictions parallel the bullet points of the findings that are found in part 2.

The taskforce then moved onto to part 4: Taskforce belief statement. Mr. Svetlik added a comment referencing Arkansas's state report and he encouraged judicious borrowing of some of their belief statements. He said he would send via email a google form where taskforce members can add their belief statements.

The taskforce then moved on to part 5 (recommendations to the GA). Mr. Svetlik asked if the taskforce was thought they should keep the establishment of an operationalizable definition of CS.

The taskforce said yes.

Mr. Svetlik then moved on to the second bullet (revision of state data-collection process) and asked for thoughts from the taskforce.

Dr. Weinberg said bullet 3 (The creation by the GA of an office of CS education) would necessitate the need for bullet 2. He said the taskforce might want to think through re-ordering or coupling some of these recommendations.

Mr. Svetlik then moved on to bullet 4 (revision of licensure process). The taskforce was comfortable with this recommendation.

Mr. Svetlik then moved on to bullet 5 (access to CS education). Mr. Svetlik noted feasibility of online CS courses in areas where this is no current CS teacher.

Ms. Hendrickson said she was not sure if that was a best practice that they should be recommending here. She said she would rather focus on things that provide more high quality access.

Dr. Weinberg agreed.

Rep Fortner then discussed some points around bullet 6 (funding). He said there was specific conversation around funding for the office of CS education, the taskforce will have to be very specific about anything else that requires funding (i.e. funding to ISBE, funding to schools, funding through grants, etc.)

Dr. Weinberg said there has been discussions in past meeting about specific funding (i.e. funding teacher licensure). He says he understands the need for specificity around funding.

Dr. Weinberg asked if making SC a component of graduation requirement should be added to this part.

Mr. Svetlik said Code.org’s framing of this is that it is part of their mission for there to be K-12 CS education opportunities in every school around the U.S.

Ms. Hendrickson added that at the moment Code.org doesn’t not recommend CS being a graduation requirement because there is not the capacity at the moment.

Dr. Weinberg said it should not specifically be a graduation requirement, but should somehow count toward graduation.

Mr. Svetlik should he would include that recommendation.

Mr. Svetlik then asked for volunteers from the taskforce to take on certain bullet points to help flesh out the content by mid next week.

Mr. Swikle said he would like to do little report around including ethics in CS education that he will send Mr. Svetlik.

Mr. Karbassi said he was too busy to take one on at the moment

Steve said he would send out an email to the entire taskforce asking for members to take on the content portion of these recommendations.

Meeting adjourned at 3:32



Illinois State Board of Education

James T. Meeks, Chairman
Tony Smith, Ph.D., State Superintendent

Illinois Computer Science Task Force Meeting Minutes

Meeting Summary by Task Force Members

Monday, May 15, 2017

1:00 p.m.–4:00 p.m.

- Illinois State Board of Education, Videoconference Room (3rd Floor), 100 N. First St., Springfield, Illinois
- Illinois State Board of Education, Videoconference Room (14th Floor), 100 W. Randolph St., Suite 14-300, Chicago, Illinois

Attendees

Task Force Members

Chicago

Jake Baskin, Code.org

Ali Karbassi, CoderDojoChi

Steve Svetlik (chair), Computer Science Teachers Association

Brenda Wilkerson, Chicago Public Schools

Don Yanek, Chicago Teacher's Union

Wayne Bevis, Principal, Lindblom Math and Science Academy

Springfield

Jerry Weinberg, Southern Illinois University

Austin Betz, Illinois Federation of Teachers

Called In

Randy Swikle, Illinois Press Association

Illinois State Board of Education (ISBE) Staff

Brian Houser

Midwest Comprehensive Center Staff

Nicol Christie

Jeremy Rasmussen

Alicia Garcia

Meeting Objectives

1. To reach consensus by voice vote on a working definition of computer science education
2. To reach consensus by voice vote on all draft recommendations
3. To review and craft sections of draft recommendations report

Computer Science Task Force Meeting

Mr. Brian Houser of the Illinois State Board of Education called the meeting to order. Members spent several minutes reviewing past meeting minutes.

A motion was put forward to approve the April 17 meeting minutes with no revisions. Mr. Swikle, attending virtually, made a motion to approve and Mr. Betz seconded. All were in favor and meeting minutes were approved.

A motion then was put forward to approve the May 5 meeting minutes. Mr. Betz motioned to approve minutes. Mr. Karbassi seconded. All were in favor.

Mr. Baskin briefly introduced himself as the proxy for Ms. Garcia from Code.org. He is the director of state government affairs at Code.org and a former Chicago Public Schools (CPS) teacher.

The task force then took a moment to review a revised version of the draft recommendations.

Mr. Houser stated that reaching consensus on the computer science (CS) definition should be a main focus for the meeting.

Members spent several minutes discussing elements of the draft CS definition. Mr. Yanek asked Mr. Baskin whether other states are satisfied with the Association for Computing Machinery (ACM) definition of CS. Mr. Baskin said other states have been working off the K-12 CS framework and feel that it is a good starting point.

Mr. Yanek asked whether a mathematics class that implements elements of CS would meet the proposed definition of CS.

Mr. Betz responded that a lot of different classes could hit on topics that are considered CS without being a CS course. The task force should consider what topics are CS and how much is required for a course to integrate those topics before it can be called a CS course.

Ms. Wilkerson said it is important to set parameters around what is considered CS. If those parameters are not clear, then what this task force believes to be important to CS might not be included.

Mr. Betz said it is critical to set parameters for task force fiscal recommendations on where schools might get money for offering CS classes, because the schools are going to want to access that money.

Mr. Yanek asked whether the task force is proposing that there be some type of audit process for school districts to check if their CS courses match the CS course current listing of code that

ISBE maintains. He then asked whether that happens now. Mr. Houser responded that if schools are receiving some type of funding, then an audit process could be instituted.

Mr. Karbassi said the task force should keep in mind that any definition the task force creates may affect people trying to bring CS into the classroom. He said as long as there is a rule or CS definition, there is going to be someone who will try to fit his or her ideas into it. He said he feels the ACM definition is great and is leaning toward it.

Mr. Yanek said he agrees. He said one of the reasons he is leaning toward the ACM definition is because it is widely accepted.

Mr. Karbassi said perhaps the task force should put into the recommendation that after 2 years, the adopted ACM definition would be reviewed for salience.

Ms. Wilkerson said the field should acknowledge the history of how technology education has been approached so that people who might be in those paths (technology related but non-CS) can understand that we are trying to move CS away from those places. She worries about people who will interpret this definition in ways that conflict with what the task force intended. She said language is needed to distinguish the use of technology (non-CS) from the creation of it.

Mr. Houser said ethics could be a component of it, but any course that focuses solely on the use of technology would not be CS.

Dr. Weinberg said it gets a little murky with generalities like “the use of.” He said it would help to come up with some guiding examples.

Mr. Svetlik gauged the task force’s thoughts on whether it should define CS education instead of just CS. He referenced the Illinois civic education report, which defines civic education rather than civics itself. He qualified this with a statement that he likes the ACM definition and would be happy to go that route if coming up with a CS definition would be too time consuming.

Mr. Karbassi said that because there are only two meetings left, he proposed that members take the K-12 CS framework verbatim or reference it for this task force’s definition.

Mr. Svetlik made a motion that the task force adopt the ACM definition verbatim from the framework document (pages 13–14). ACM definition: “The study of computers and algorithm processes, including their principles, their hardware and software designs, their applications, and their impact on society.” This definition would be supplemented further with some examples of what would be CS and wouldn’t be CS pulled from the same document.

Mr. Karbassi proposed referencing pages 13–17 to be a little more in depth.

Mr. Svetlik said he would like to keep it succinct and brief, expanding as necessary to different stakeholder groups.

Mr. Betz seconded the motion.

All task force members voted to carry the motion in a voice vote.

The task force then moved on to the revision regarding the state data collection process for analyzing success of CS education programs around the state.

Mr. Karbassi said he remembers the suggestion of having the recommendation, then having the meat come later: When we are voting, are we only considering the main part and not the meat?

Mr. Houser responded affirmatively and stated that at the June meeting, the Task Force will fine-tune the additional information if needed.

Mr. Svetlik said he thinks there is clarity around the lack of timely informative data that can help us make decisions as a state with regard to CS education policy. Mr. Svetlik said he proposes that ISBE revise its process for collecting data in CS to ensure that every K–12 school, every course that is considered CS, the racial and gender identity background of every student, and the qualifications of the teachers defined by the licensure would be established. Ideally, we would have fiscal year (FY) 2017 data.

Mr. Karbassi suggested removing “analyze success of” so it would read as “revision of state data collection process for CS education programs around the state.” He said there, the task force can discuss what kind of data needs to be collected. Mr. Karbassi then motioned to vote on this revision.

Mr. Bevis seconded.

All task force members voted to carry the motion in a voice vote.

The task force then moved on to the revision of the CS licensure process. Mr. Svetlik said he would like to add “the revision of the licensure process for prospective, preservice, and in-service K–12 CS educators.”

Mr. Betz asked if the task force is going to recommend a specific path or licensure process, or are we going to say this is something that needs to be done and provide some options. He said he fears that the General Assembly might not like certain parts of this and throw out the whole recommendation because of it.

Dr. Weinberg said in the last meeting that they had discussed writing the recommendations as standalone items so the whole things doesn’t get thrown out if they happen to dislike a recommendation.

Mr. Yanek said the task force should consider referencing the fact that Illinois State (University) graduates the most students with education degrees in Illinois and has developed a pathway for preservice and in-service teachers. He said there already is a foundation laid and something that can be referenced where a lot of this work already has been done. He also thinks it is important to state that these are not proposals that have to go into effect immediately, but are recommendations for a pathway to the future.

Mr. Baskin said in talking about a licensure process where it generally seems to focus on longer term endorsement or full certification, are there other short-term solutions the task force would want to recommend?

Mr. Karbassi said conversations about short-term solutions for licensure can be saved for when the task force discusses the details for each recommendation at the next meeting.

Mr. Svetlik motioned to approve the CS licensure process recommendation: “The revision of the licensure process for prospective, preservice, and in-service K–12 CS educators subject to our prior discussions going into more detail.”

Mr. Karbassi seconded the motion.

All task force members voted to carry the motion in a voice vote.

The task force then moved onto the next recommendation: student accesses and equity in CS.

Ms. Wilkerson said another bullet in the document talks about the lack of access and diversity in CS. She said that language needs to be included somewhere in this recommendation. Maybe add the same thing to this recommendation as the last one: “subject to our prior discussions going into more detail.”

Mr. Yanek said the word “access” is a word that seems too broad.

Mr. Houser said the task force might consider breaking this down into two separate recommendations, one that focuses on access and the other on equity.

Mr. Betz said he doesn’t think they need to remove the word “access” from this recommendation. He said the word “access” can be explained more clearly in the detailed section. He asked whether the task force is coming up with a plan to improve access or if that is something we are recommending someone else do.

Mr. Svetlik said reading some of the comments around this and looking at what other states have done, a short-term and a long-term goal for access. Some growing programs statewide ensure we are building on the success of those programs and having a keen eye on an eventual mandate.

Mr. Svetlik said he realizes a mandate may cause problems regarding capacity to teach (not enough CS teachers). He said if they state x number of years a mandate will be implemented might make it more palatable.

Mr. Baskin said he likes the “x number of years” idea, but was nervous about setting that goal too soon and forcing CS to become something we don’t want it to be. He said one thing that some states have done is required that every school at least offer CS, which would meet the task force’s goal of student access.

Mr. Bevis asked whether they can say something in terms of access and enrollment around schools reflects the demographics of their schools.

Mr. Baskin said he thinks that is a great goal.

Mr. Betz said he thinks access and enrollment need to be two separate recommendations.

Dr. Weinberg said changing the culture in a way that would reflect the demographics is a difficult thing, otherwise we wouldn’t be here at this task force.

Ms. Wilkerson agrees with separating the two, but feel that they both still need to be addressed. By saying CS is at least in every school, districts that didn't have CS before will at least have it now.

Mr. Yanek said that by saying every school should have CS, you might create situations where only one demographic ends up in that course. He said the task force should consider a recommendation that would make CS a high school graduation requirement.

Mr. Svetlik said he came up with another distinct recommendation: "Every Illinois K–12 public school achieve the mirroring of the demographics of the school to which they attend in 10 or x number of years."

Mr. Karbassi said he thinks what Mr. Yanek is getting at is that we should say in x years there should be a graduation requirement with pathway examples from other states. He said that rather than having it required in 10 years, have it revisited in 5 years instead.

Mr. Yanek said the CS advisory board could be tasked with developing a timeline and pathway to a graduation requirement without specifying the number of years.

Mr. Karbassi said he recommends stating that there be another task force formed in the next two years that would focus solely on creating a pathway toward a CS graduation requirement.

Ms. Wilkerson said by recommending an eventual task force for a pathway toward a CS graduation requirement, we have given ourselves an on-ramp to achieve this in x number of years. She said we are making the recommendation that CS exists in every school, and that—after a certain period of time—the demographics at the school be mirrored, which will set the trajectory for this goal.

Mr. Yanek asked whether it would be better to say that the creation of the new task force in 3 years would produce a plan for creating a pathway to a CS graduation requirement.

Ms. Wilkerson said the current task force also should make sure to say "ensuring access to CS education in all areas of the state." She asked if they should add x number of years to that as well.

Mr. Svetlik said he liked the idea of 3 years for the CS graduation requirement task force.

Ms. Wilkerson said there is an equally important need to have school-based personnel understand what CS is as well, and that a 3-year time frame can help allow for that.

Mr. Baskin said the recommendation currently states K–12. He asked what it would mean to require CS at the elementary level.

The task force changed this recommendation to secondary.

Mr. Betz said only a handful places south of Joliet offer CS. For some schools, it is difficult to find teachers that are CS literate. He said it could take more than three years just to make it offered at schools.

Mr. Svetlik said there should be some type of buffer between the point at which this task force is created and the point at which things need to happen.

Mr. Karbassi then clarified the three points under this recommendation as they have been discussed so far. He said the first point states that schools need to offer access to a CS course for secondary students within three years. The second point states that within x years, schools ensure that the course matches demographics. The third point states there needs to be a task force appointed within three years to approve a pathway for a CS graduation requirement.

Ms. Wilkerson clarified that they (as a task force) would recommend having CS as a graduation requirement, but the details of that requirement would be left to the new task force in three years to come up with a plan.

Mr. Baskin said one way of achieving the second point is through a graduation requirement. He suggested omitting the second point since it would already be built into the third point.

Mr. Svetlik said calling out demographics in the second point is important, even if it is redundant with the third point.

Mr. Baskin said the second point sounds too aspirational and not enough like a recommendation. He suggested the following language: “rethinking data collection processes to include at a minimum a comparison of the demographics of CS course to the demographics of each school within the state.

Mr. Bevis said that by making these individual points, the General Assembly may accept some and reject others. If the General Assembly rejects the graduation requirement (point three), then the demographic part dies with it.

Mr. Svetlik said some General Assembly members looking at these recommendations might ask, are these funded or unfunded mandates, and how is this going to affect my constituency? He said it might be a good idea to name somewhere in the recommendation list something consistent with our diversity belief statement.

Mr. Karbassi said if the General Assembly doesn’t accept point three, the second point around demographics on its own still could have an effect.

Mr. Svetlik motioned to recommend to the General Assembly the first point: “ensuring access to CS education statewide by requiring every secondary school to offer at least one CS course within three school years.”

Mr. Karbassi suggested using a specific date instead of years.

Mr. Betz said by the time these recommendations go through the General Assembly, it could affect the timeline of using a specific date.

Mr. Svetlik suggested “within three years of adoption of this recommendation.” He then restated the recommendation: “ensuring access to CS education statewide by requiring every secondary school to offer at least one CS course within three school years.”

Ms. Wilkerson asked whether the task force sees the necessity of saying “annually.” The language could be interpreted as requiring a CS course for only 1 year after the 3-year mark.

Mr. Svetlik added the word “sustained” to say the following: “ensuring sustained access to CS education statewide by requiring every secondary school to offer at least one CS course within three school years.” He then motioned to approve this recommendation.

Mr. Karbassi seconded.

All task force members voted to carry the motion in a voice vote.

The task force then moved on to the second point.

Mr. Karbassi said it’s great to have a CS class, but teachers also are needed who are able to effectively teach CS. He suggested schools be required to have at least one CS teacher who has gone through the CS licensure process. He said having a separate bullet point around this might be a good idea.

Mr. Betz asked whether they are going to include a plan or specific guidelines for how demographic data are measured. He asked, what is the state going to do if they don’t meet this requirement?

Mr. Bevis suggested noncompliant schools could be flagged on the school report card.

The task force liked Mr. Bevis’s idea.

Ms. Wilkerson: Do we want it on the report card within 10 years, or start having them listing it as over time, which would show their progression toward mirroring?

Mr. Svetlik liked Ms. Wilkerson’s latter thought, and said the recommendation could be added to the report post-haste to start showing that progression.

Mr. Betz: For schools to meet this requirement, are they going to start limiting white males from taking CS?

Mr. Svetlik asked if gender identity should be included in the demographics.

Mr. Karbassi suggested leaving the included part in the detailed section. He said they could say in the paragraph “including gender identified.”

Mr. Baskin suggested adding the phrase “traditionally underrepresented groups in CS.”

There was then a short discussion on the type of data they want to collect (regarding demographics) that might not be typically reflected on a school report card.

Mr. Karbassi said what kind of data is collected and what is on (or should be on) the report card seem like two separate points.

Mr. Svetlik motioned that they recommend to the General Assembly the following point: “In order to place a focus on equitable access to CS education, include comparison to gender and

race/ethnicity demographics of CS courses to the overall school demographics on the state report card starting in 2018, with the goal of CS enrollment reflecting each school's demographics within 10 years.”

Mr. Karbassi seconded.

All task force members voted to carry the motion in a voice vote.

Mr. Svetlik then motioned for a third point to recommend to the General Assembly: “that there be a CS graduation requirement and that a task force be created within three years with the express purpose of producing a plan for creating a pathway to a CS graduation requirement.”

Dr. Weinberg thought they were going to put in the phrase “three years after the adoption.”

Mr. Betz said that could be clarified later, that any time frame is from the adoption of each recommendation.

Mr. Houser said the task force could include a disclaimer.

Dr. Weinberg said the question is whether there would be a disclaimer for all the years mentioned in each of the three points (for each point) as opposed to changing a single point to reflect that.

Mr. Karbassi feels that there is a word missing before “be.”

There was then a short discussion on the recommendation in its current form that makes it sound like a CS graduation requirement should be established right away, which is incongruous with the rest of the recommendation.

Mr. Svetlik suggested having two points for this recommendation: one that recommends “a CS graduation requirement be implemented across the state of Illinois,” and another that says “to support the aforementioned, a Task Force shall be created within three years with the express purpose, etc.”

Mr. Karbassi said if we have two bullet points, the General Assembly could take one and leave the other. In order for it to have bite, it should be one point.

Mr. Baskin suggested: “We recommend that CS becomes a graduation requirement and that a Task Force is created in three years to determine the timeline to implement this graduation requirement.”

Mr. Svetlik withdrew his prior motion and motioned to approve: “We recommend that CS becomes a graduation requirement, and that a task force is created in three years to determine the timeline to implement this graduation requirement.”

Mr. Karbassi suggested “within” instead of “in.”

“We recommend that CS becomes a graduation requirement, and that a Task Force is created within three years to determine the timeline to implement this graduation requirement.”

Mr. Yanek asked if they should specify high school.

Mr. Betz said it sounds like the task force's only job is to establish a timeline and not plan a pathway.

“We recommend that CS becomes a secondary graduation requirement, and that a task force is created within three years to determine the timeline and plan to implement this graduation requirement.”

Mr. Karbassi seconded.

All task force members voted to carry the motion in a voice vote.

The task force then moved on to the topic of funding.

Mr. Svetlik said he thinks funding should be its own point. If not, he said, they strive to encompass the idea of funding—specifically, how the idea of funding would be played out within the substance of each bullet point.

Mr. Karbassi said the idea of a CS requirement is great, but if schools don't have the money, then it's a moot point. He said they should include at least what they think it would cost for a school to bring on one to three CS teachers.

Ms. Wilkerson said she is afraid that if they have CS and funding together, the General Assembly might strike the whole thing. She said she would rather get CS in the schools and then allow those schools to search for their own funding.

Mr. Svetlik said he understand the importance of what Ms. Wilkerson is saying, but still believes it is important to include the notion of funding as an individual point. He then asked the task force to come up with some language around this point.

Mr. Bevis said in his experience from a school level, the cost of CS wasn't that great, and that it was the cost of professional development for CS that was big. He said students are shifting out of the fine arts and world languages and into CS. Because of this, they have been reallocating funding from fine arts into CS.

Ms. Wilkerson said it would be helpful if there was money from the state for teachers to go back and get their CS credential.

Mr. Karbassi said maybe not every point needs to have funding included in the recommendation, and that they should only focus on certain ones.

Dr. Weinberg said a lot of rural areas might need additional funds just to get a reasonable internet connection.

Due to time, the task force tabled the discussion on CS funding and moved on to the recommendation of having a CS office of education headed by a principal consultant.

Mr. Yanek asked whether this is something that will be funded by the General Assembly or ISBE.

Mr. House suggested just recommending that ISBE have a principal consultant in CS at a minimum.

Mr. Svetlik said he wants to shoot big and motion to approve the recommendation as it currently is: “the creation of and committed ongoing funding of a standalone office of CS education headed by a principal consultant of CS education.”

Mr. Bevis seconded.

All task force members voted to carry the motion in a voice vote.

Public Comment

Martha Eldredge Stark, EFE #20 System Director said high schools most often function in silos (e.g. English, mathematics, etc.). Yet this is not how the mind works. She said research makes it clear that the mind is constantly searching for meaning and connections. She said there have been strides to integrate all four areas of STEM, within which career technical education (CTE) is contained. She said one of the programs for which her organization is accountable is the integration of core academics into CTE. She said her organization has seen students gain a deeper understanding of mathematics and science when they are given real-world applications in their project-based learning in pre-engineering classes. She said all nine of the high schools she works with offer this series of pre-engineering classes. She said recently that several of her schools have adopted Project Lead the Way’s CS sequence of core classes, which is aligned to both Advanced Placement science principles and CS. She said some of these classes are taught by CTE business teachers, CTE applied tech teachers, or mathematics teachers. She said all Project Lead the Way classes require extensive professional development. She said there is a tremendous need for students to be literate in CS, which will precipitate a high demand for teachers. Many teachers already possess the skills to handle these classes or could gain them from professional development without necessarily requiring additional college credits. Perhaps just passing a revised CS exam to make sure they have those skills would suffice. She asked the task force to think outside the box by (1) not creating an additional silo and to work on making CS integrated into STEM education and (2) realizing that many teachers already possess these skills, and if they are given the opportunities to collaborate across departments, the students will be the beneficiary.

Meeting adjourned at 4:03 p.m.



Illinois State Board of Education

James T. Meeks, Chairman
Tony Smith, Ph.D., State Superintendent

Illinois Computer Science Task Force Meeting Minutes

Meeting Summary by Task Force Members

Friday, June 9, 2017

1:00 p.m.–4:00 p.m. CT

- Governor Bruce Rauner's Office, 205V Conference Room, 207 State House, Springfield, Illinois
- James R. Thompson Center, Office of the Governor, Video Conference Room (16th Floor), 100 West Randolph St. 16-100 Conference Room Chicago, Illinois

Attendees

Task Force Members

Chicago

Jake Baskin, Code.org

Don Yanek, Chicago Teachers' Union

Springfield

Steve Svetlik (chair), Computer Science Teachers Association

Austin Betz, Illinois Federation of Teachers

Randy Swikle, Illinois Press Association

Called In

Ali Karbassi, CoderDojoChi

Jerry Weinberg, Southern Illinois University

Brenda Wilkerson, Chicago Public Schools

Wayne Bevis, Principal, Lindblom Math and Science Academy

Illinois State Board of Education (ISBE) Staff

Brian Houser

Angelique Hamilton

Midwest Comprehensive Center Staff

Nicol Christie

Dan Botting

Meeting Objectives

1. To vote on remaining recommendation(s)
2. To reach consensus on the Draft Computer Science Education Task Force Report
3. To approve the Final Computer Science Education Task Force Report

Computer Science Task Force Meeting

Mr. Svetlik, chair of the task force, called the meeting to order. Members spent several minutes on introductions and the agenda. Mr. Svetlik noted that there were eight members present, enough for a quorum. (Mr. Weinberg was expected to attend but had not yet arrived.)

Mr. Svetlik noted that the main objective for the day was to review the draft content of the report.

The task force spent several minutes reviewing past meeting minutes, focusing specifically on the highlighted portions.

Mr. Yanek stated that the highlighted portion on page 2 could stand as is.

Mr. Baskin mentioned that the “ACM framework,” reference on page 2 should instead read “K–12 CS framework.” This change was made throughout the document.

Mr. Swikle stated that the highlighted portion on page 3 could be stricken from the minutes as it was clarified during discussion.

Mr. Houser noted that on page 4, it should say “June” instead of “June 12” as that meeting was rescheduled.

Ms. Christie noted that the Midwest Comprehensive Center already had the correction needed for the highlighted text on page 11 and no additional input was needed.

Mr. Svetlik made a motion to approve the May 15 minutes as revised and Mr. Yanek seconded the motion. All were in favor and the meeting minutes were approved as revised.

Mr. Svetlik then directed the task force to revisions of the working draft report on data collection (page 12).

Mr. Weinberg joined the meeting via phone and his attendance was noted by ISBE.

Mr. Weinberg, who worked on a portion of the draft report about state data collection, stated that the revision that he had made to the recommendation was a result of a recent phone call with Mr. Houser and ISBE data analyst where it was decided Illinois would mandate data collection as a part of the state report card. This requirement was created to give faith to the demographic information and track progress toward goals.

Mr. Svetlik noted that he changed the recommended classifications from “gender” to “sex” and from “ethnicity” to “race,” as well as adding free and reduced lunch status on page 12 of the draft report.

Mr. Yanek stated that the task force should maintain uniformity with ISBE, asking if they use “race” and “sex,” or “ethnicity” and “gender?” Or whether it mattered?

Mr. Houser noted that the ISBE utilizes the free and reduced lunches phrase most frequently.

Mr. Baskin noted that the school report card website uses ethnicity/race and gender.

Mr. Svetlik proposed that the task force should stay consistent with that terminology.

Mr. Svetlik made a motion to vote on the recommendation as follows: “Requiring the addition to the Illinois Report Card for each school in the K–12 system of data on courses offered that are designated as aligned to the definition of computer science (CS). These data will include enrollment data disaggregated minimally by gender, ethnicity/race, and free and reduced lunch status, specifically with the demographics of CS course enrollment reflecting each school’s demographics within ten (10) years.”

Mr. Weinberg seconded the motion.

Mr. Houser led a roll call vote and the recommendation was passed unanimously.

Mr. Svetlik directed the task force to the recommendation on state funding, on page 16, stating that essentially the recommendation is to specifically ask for funding. A discussion was held about whether the task force wants recommendations for funding interwoven within other recommendations or as a stand-alone piece.

Mr. Svetlik opened the topic to discussion and asked if there were any concerns about funding being a separate bullet point.

Mr. Betz stated that by submitting a funding recommendations as a separate item, the general assembly may accept other items but not funding, which would result in a mandate that is unfunded and requires schools to divert money from other sources.

Mr. Svetlik mentioned that the recommendations are meant to be based on research and it will be up to the general assembly to decide what to do with them.

Mr. Yanek asked for clarification on whether the recommendation will be voted on by the general assembly as a resolution or a law.

Mr. Houser responded by stating that these are purely recommendations from experts in CS education to allow the general assembly to make decisions. He noted that any number of the

recommendations may be taken and put into rules/laws. He clarified that this report is meant to inform the general assembly about best practices and recommendations.

Mr. Baskin added that more guidance never hurts. Specifically, he identified the need for a principal consultant as well as funding as good topics to include in the report.

Mr. Svetlik mentioned that page 17 recommends that the general assembly work with key stakeholders and nonprofits to make concrete funding recommendations.

Mr. Svetlik asked if the task force wanted to call a vote.

Mr. Yanek asked for clarification on the vote, stating that the task force had three options: strike the funding recommendation and try to put a price tag on the other recommendations; keep the recommendation and try to put a price tag on the other recommendations; or keep the recommendation only as a signal that funding will be needed.

Mr. Svetlik responded that the task force doesn't have time to go back and find the data to create price tags for each recommendation.

Mr. Baskin noted that the task force could do some quick calculations. For instance, training CS teachers would cost approximately \$4.3 million over 3 years based on the statistics already available on the percentage of schools with CS teachers already and the average cost of training existing teachers in CS for the schools without them.

Mr. Weinberg stated that he was in agreement with leaving the report as is.

Mr. Svetlik stated that the level of specificity needed to make recommendations on funding isn't available given the time constraints. In regard to Mr. Yanek's question, the task force will look at adding a call for funding to each recommendation, leaving the current vote to focus on keeping or striking the recommendation.

Mr. Svetlik made a motion to adopt the recommendation in the final paragraph of page 16 as written.

Mr. Betz seconded the motion.

Mr. Houser led a roll call with all "ayes."

Mr. Svetlik stated that the motion passed and the recommendation was adopted.

Mr. Svetlik directed the task force to page 12 on ethics in CS education, stating that the rationale behind the recommendation was forwarded by Mr. Houser the day before.

Mr. Swikle summarized his rationale, stating that ethics cannot be compelled, but good teachers can influence students' perceptions of ethical choices. They can nurture the motivation of

students in a way that guides them beyond self-serving interests toward decision making that prioritizes community welfare and recognizes the good and right thing to do. In computer science, the skills students learn can be used for good or bad, and thus ethical awareness must be infused in the computer science classroom and be as important as the competencies developed.

Mr. Swikle noted that ethics is likely already in the curriculum, but the recommendation would serve as a reminder of the importance of ethical training in the CS curriculum while allowing schools leeway to create ethical curricula to fit their needs.

Mr. Weinberg agreed that the recommendation should be in the report, but worried about the wording as there are many different types of ethics, including ethical use of computers, ethics of advertising technology, ethics of development, etc.

Mr. Swikle agreed that the wording probably could be improved.

Mr. Baskin noted that ethics is a huge part of computing and is actually included as a separate practice in the K–12 CS framework. One way to make sure ethics is included is to highlight that the K–12 CS framework definition includes ethics.

Mr. Swikle thought that was a good addition, but ethics needs its own bullet point to emphasize the priority it has.

Mr. Svetlik offered a potential replacement for verbiage: “The ethical implications of K–12 CS education, as defined by the K–12 CS framework, be adopted as a pervasive thread in all courses that are identified as CS courses.” He noted this makes it a separate bullet point while still adhering to the framework.

Mr. Swikle stated that the language is very educational-oriented and that the average citizen won't understand it.

Mr. Svetlik responded that some of the computer science jargon and technical language may not be easily understood by a layperson. However the task force needs to remain mindful of the K-12 CS Framework that served as the foundation for many of the task force recommendations and are geared toward the industry of computer science.

Mr. Swikle responded that there needs to be something more with a focus on how CS knowledge is going to be used.

Mr. Svetlik pushed back, quoting a [specific article](#) from the Harvard Business Review (HBR), “ethics also deserve more attention at every educational level. AI technologies face ethical dilemmas all the time. For example, how to exclude racial, ethnic, and gender prejudices from automated decisions...we need people and programmers who can make well-thought out contributions to those problems.”

Mr. Svetlik concluded that Mr. Swikle’s work is good and he clearly put in lots of effort, but the task force needs to not only focus on how CS knowledge is used, but how it is created.

Mr. Yanek stated that his first thought on ethics in CS is teaching students how to behave when using computers and technology and the importance of protection of privacy. He also understands the need to include the ethics of product development and software piracy.

Mr. Swikle responded in agreement that the issues of application and consumption are so important that they should be included in the definition of computer science. There are too many ethical issues to be covered there alone.

Mr. Svetlik proposed new verbiage: “As recognized within the K–12 CS framework, the ethics of software and hardware production and consumption should be interwoven into all K–12 CS courses”.

Mr. Weinberg liked the idea as the ethics of using and consuming technology should be taught to our kids, but note that what it seems to be missing is the ethics of the computer science professionals.

Ms. Wilkerson agreed that Mr. Svetlik’s proposed revision of the recommendation originally crafted by Mr. Swikle about the "production" end of computer science better encapsulated what the task force had been discussing. She noted that it’s easy to assume consumption (piracy, etc.), but the task force responsibility is to also address the ethics of development.

Mr. Yanek stated that he still wants some inclusion of ethical behavior (e.g., digital citizenship, no death threats, no bullying, no inappropriate images, etc.).

Mr. Svetlik noted that digital citizenship is called out right before this bullet as a component of what CS is built on.

Mr. Baskin mentioned that there’s a risk to call out specific aspects of CS in the task force recommendations because there would be a need to justify each specific aspect and it changes the focus. He argued that the task force does not need ethics as its own bullet because it is built into CS.

Mr. Swikle stated that he thought Mr. Svetlik's proposal seemed too impersonal and requested a few moments to make revisions.

Mr. Svetlik responded that there was, unfortunately, no time to do so as the task force was at the point of voting to approve the report.

Mr. Svetlik asked a logistics question and then put the item to a vote. He asked if the task force adopted a recommendation of ethics, knowing that the verbiage needed to change, how would that play out with the approval of the final report?

Mr. Houser responded that the task force needed to make all final decision regarding the content of the report today. He stated that it will not hurt to have ethics included as part of a recommendation.

To address Mr. Swikle’s concerns, Mr. Svetlik then made a motion to adopt as a separate bullet point the following: “The ethics of software and hardware production and consumption should be interwoven into all K–12 CS courses, as recognized within the K–12 CS framework.”

Mr. Swikle shared concerns about the terms “ethics of software and hardware.” He stated that it needed to be very clearly aimed at the users of computers, not creators, and asked for time to revise the language.

Mr. Houser suggested that the task force resolve the issue and move to vote due to time constraints to complete report today.

Mr. Swikle proposed a revision to the motion, adding that an ethical awareness of democratic and moral values in CS should be infused as a component of every CS course.

Mr. Svetlik suggested that the task force merge this with the earlier motion.

Mr. Baskin commented that maybe it was too late to add another recommendation. He pointed out that all the other recommendations had much further consideration, and ethics are already interwoven into other parts of the report. Moreover, the task force needed to spend time on the recommendations already fleshed out.

Mr. Baskin made a motion that the task force not include a separate bullet point given the time limitations.

Mr. Yanek and Mr. Weinberg seconded the motion.

Ms. Christie asked to confirm whether there was still a quorum as Mr. Bevis may have had to drop off the conference call.

Mr. Svetlik noted that Mr. Bevis did have to drop off, but there was still a quorum.

Mr. Houser led a roll call vote. Mr. Swikle voted “nay,” Ms. Wilkerson abstained, Mr. Bevis was not present, and the rest of the members present voted “aye.”

Mr. Swikle made a concluding comment that he was extremely disappointed that this report would not include a specific focus on ethics.

Mr. Betz responded that, to be clear, the CS framework includes ethics. Although the report may not explicitly mention it, ethics are included in the curriculum.

Mr. Swikle responded that in this day and age, the word “ethics” should be emphasized.

Mr. Svetlik expressed his feelings that unfortunately, due to time, the task force wasn't able to do so.

Ms. Christie suggested to Mr. Baskin that the task force consider including Mr. Swikle's ethics recommendation and supporting rationale as an appendix or addendum to the meeting minutes, as a compromise. Members responded in favor of this suggestion and Mr. Yanek made a motion to include Mr. Swikle's full proposal in the minutes as an appendix.

Mr. Svetlik seconded the motion.

Mr. Houser led a roll call with all "ayes" except Mr. Bevis, who was absent from this point in the meeting until the end.

Mr. Swikle thanked the committee for being patient with him as a lay person who doesn't have a great understanding of CS.

Mr. Yanek expressed his appreciation for Mr. Swikle's passion on this topic. He hoped this was not the last time that the issue would be discussed and stated that Mr. Swikle's thoughts and ideas would be included in the minutes and brought up again in the future.

Mr. Svetlik moved the discussion to reaching consensus on the draft report. He stated that he wrote the report as a call to action and asked if the task force felt okay with the flow of the report. He also asked if there were any concerns about the format of the narrative flowing from case to findings to summary of recommendations to expanded content supporting each recommendation.

Mr. Baskin suggested moving the executive summary to the front of the report instead of the middle.

Mr. Svetlik agreed. No other comments were made by the task force. Mr. Svetlik stated that the vote on changes could be made in sum at the end instead of individually.

Mr. Svetlik then pointed members to pages 5–8 of the report (the overview) and asked if there was any feedback, specifically on goals for the work.

Ms. Wilkerson commented that she admired the inclusion of goals of the task force.

Mr. Houser clarified that feedback could be an addition, deletion, or revision.

Mr. Svetlik asked if there were any hyperlink issues as he had experienced some earlier.

There were no comments on this section of the report by the task force.

Mr. Svetlik asked again if there were any changes required.

The task force spent a few minutes reading through the rest of the document.

Mr. Baskin asked if all of the statistics and other information had been double checked.

Mr. Svetlik responded that the grammar would be checked heavily by the Midwest Comprehensive Center.

Mr. Baskin commented that on page 6, in the middle paragraph, there were statements such as “less than approximately 2%, greater than approximately 11%, just over 21%.” He wondered if the task force could give the specific numbers.

Mr. Svetlik thought this was a good idea and noted that 1.8% were Black.

Mr. Baskin responded that the report could change 1.8% to “less than 2%.”

Mr. Betz commented that the report should be consistent by including one decimal place as seen in the statistics related to Illinois as a whole, which were 14.5% and 15.6%.

Mr. Svetlik found that the exact rate on page 6 was 21.1% female.

Mr. Yanek found that the percent of Hispanic test takers was 11.2%.

Mr. Svetlik directed the team’s attention to the footnote on data limitations and the team agreed it should be included.

Mr. Svetlik stated that all the data referenced by Mr. Baskin were pulled from a combination of non-for-profit, such as the College Board, and governmental agencies sources, so he was comfortable using them.

Mr. Baskin replied that the numbers are updated monthly, so the report could include what month the data were from to avoid issues down the road.

Mr. Yanek suggested the report state \$1.8 billion instead of the full number.

Mr. Svetlik agreed as that sounded more impactful and less reliant on specific figures. He also agreed that the month the data were pulled should be included.

Mr. Baskin suggested mentioning that the data come from the Conference Board, another not for profit agency, for proof of reliability and Mr. Svetlik agreed.

Mr. Svetlik asked if there was anything else; there were no comments from the task force.

Mr. Svetlik moved the discussion to the executive summary (pages 9–10).

Mr. Houser asked if the hyperlinks would be included in an appendix for works cited for the paper versions of the report.

Ms. Christie agreed this was a good idea and said she would check with the editors at American Institutes for Research to be sure it gets done.

Mr. Svetlik asked if anyone had changes to any of the findings.

Mr. Yanek suggested a change for the second bullet point to: “offerings by course code, such as distinguishing between CS from career...”

Mr. Svetlik agreed with the change.

Ms. Wilkerson suggested a change for the third bullet. Specifically, she asked if the report should also include that there were no definitions provided for the content within the courses offered.

Mr. Svetlik agreed and revised the text to read, “specifically offer students CS courses without strong evidence of CS course content taught therein, as such data are self-reported at the district level.”

Mr. Baskin commented that the fourth bullet used unnecessarily strong language and that it may need to be toned down.

Mr. Svetlik agreed and Mr. Baskin suggested a change such as: "While Illinois should be applauded for being one of the only states in the country to have an official endorsement for CS, the current requirements create an unnecessary barrier to providing students access to high-quality CS education." He thought this language could replace the first sentence.

Mr. Svetlik agreed that this language fit better with the recommendation as it has a more positive tone. However, he noted that Representative Fortner, one of the co-sponsors of the legislation leading to the formation of this task force, wanted it to be clear to the general assembly what the problems were in the findings. Therefore, the order should be reversed: “Illinois’ licensure system creates an unnecessary barrier to providing students access to high-quality CS education, even while it’s among the leaders as one of the only states in the country to have an official endorsement for CS.”

Mr. Svetlik then asked if there was anyone on the call who was a citizen interested in making public comment and Mr. Houser expanded that to include callers from Chicago or Springfield. There were none.

Mr. Svetlik then moved the conversation to the Summary of Recommendations.

Mr. Yanek suggested that the report replace “secondary” with “high school” as not everyone may know that “secondary” means “high school.” Mr. Svetlik agreed and also suggested adding a parenthetical, such as “(secondary).” He stated this change would not require a vote as only major content pieces do.

Mr. Svetlik asked if there were any other thoughts or comments; the task force had no further comments.

Mr. Svetlik moved the discussion to the expanded description of recommendations.

For the first bullet point, Mr. Baskin suggested adding a couple paragraphs on funding if the task force would like to include them. He read each funding item for the rest of the members.

Mr. Svetlik responded that he would like to note in the minutes that Mr. Baskin does a great job multitasking and Mr. Svetlik appreciates the work he does. He agreed that these new paragraphs on funding should be included after the second paragraph.

Mr. Baskin shared the revised paragraphs with Ms. Christie for inclusion in the final report.

Regarding the second bullet, Mr. Svetlik noted there had already been extensive conversation.

Ms. Wilkerson suggested that the fourth bullet point within this recommendation be struck.

Mr. Svetlik agreed and asked the rest of the team for their opinion. Mr. Betz agreed and there were no other comments.

Under bullet point three (bullet on ethics was already stricken from the report), Mr. Svetlik noted that the team already discussed the bullet.

Mr. Houser reiterated the changes that had been made earlier and Mr. Svetlik stated that there would need to be changes throughout the document to stay consistent.

Mr. Svetlik liked the immediate, medium, long-term structure of the fourth bullet and gave credit to Mr. Baskin and his team for drafting it.

Under bullet point five, Mr. Svetlik noted the required change from “secondary” to “high school (secondary).”

Mr. Svetlik stated that he felt strongly about keeping the phrasing at the start of bullet point six about not taking away current funding.

The team gave audible consensus.

Mr. Svetlik then mentioned he included the reference to Every Student Succeeds Act (ESSA) monies as it was in the [State of the States Landscape report](#).

Mr. Svetlik asked if there were any objections and Ms. Wilkerson responded that she had none; no other members objected or responded.

Mr. Svetlik suggested a change to bullet point seven to include the clause about the advisory group forming and meeting on an annual basis from a prior draft.

There were no concerns about bullet point eight.

Mr. Svetlik stated that what remained was introducing the portion about the advisory group in bullet point seven and closing commentary. He asked if that needed to be done at the time.

Mr. Houser stated that the task force could vote to allow Mr. Svetlik to draft this language at a later date.

Mr. Svetlik asked that members who felt closing commentary was necessary for the report to let him know.

Ms. Christie suggested that everyone provide final comments and to be incorporated into a closing summary in the report.

Mr. Weinberg declined closing commentary and stated that it would require another vote at another time if they did so.

Mr. Svetlik agreed that he didn't think it was necessary for members to provide closing thoughts and asked if anyone had objections. There were none.

Mr. Svetlik made a motion for a roll call vote to adopt the report as revised to be the final report of recommendations to be submitted to the governor and general assembly.

Mr. Betz seconded the motion.

Mr. Houser led a roll call. All responded with "ayes" except Mr. Bevis, who was not present at the time.

Mr. Svetlik stated that the report was now final.

All clapped.

Mr. Svetlik stated that members needed to approve the minutes from the previous meeting. He stated that the task force could delegate responsibility to him or they could meet again to have a roll call vote.

There was unanimous agreement that Mr. Svetlik would have the responsibility for approving the final June 9 minutes.

Mr. Svetlik made a motion to give himself responsibility to approve the final meeting minutes.

Mr. Weinberg seconded the motion.

Mr. Houser led a roll call. All responded with "ayes" except Mr. Bevis, who was no longer present.

Mr. Svetlik wanted to give a shout-out on the record to Mr. Houser and Ms. Christie and their staff for their work.

All clapped.

Ms. Christie reminded Mr. Svetlik about a final charge that he intended to share with members to be “the squeaky wheel.”

Mr. Svetlik thanked Ms. Christie and stated that the members of the task force should reach out to their professional and social network about this report as well as its significance. He stated that the goal was making decision makers aware of the report so that it can be adopted and help improve Illinois' economy and meet the needs of all students, not just those privileged by the accident of where they were born and/or attend school, with the opportunity to take CS.

Mr. Houser, on behalf of the state superintendent, thanked everyone involved in the task force.

Mr. Houser explained the timeline: The report will be revised by the Midwest Comprehensive Center and ISBE and then be put into the hands of the general assembly by July 1st. From there, advocacy is important to move things along.

Mr. Houser also stated that the report would be available on the ISBE website and sent out to the members of the task force upon completion.

Mr. Svetlik gave recognition to Jenna Garcia for the hashtags on the report and suggested that the members use them to start an advocacy campaign.

Mr. Yanek acknowledged Mr. Svetlik for all his hard work and leadership during the last 2 months.

All clapped.

Mr. Svetlik made a motion to adjourn.

Mr. Betz seconded the motion.

All responded with “ayes” except Mr. Bevis, who was absent.

The meeting adjourned at 4:03 pm.

Appendix

TO: SBE Computer Science Task Force Members
FROM: Randy Swikle, Illinois Press Association Representative
DATE: June 8, 2017
RE: Final Report Recommendation/Rationale (Ethics)

Below is a recommendation and rationale for the final report of the Computer Science Task Force.

Instruction to promote an ethical awareness of American democratic and moral values, computer usage issues, and ethical dilemmas and problem-solving strategies should be a component of every computer science course.

Supporting rationale:

RATIONAL FOR ETHICAL AWARENESS TRAINING

I. (“Ethics in Computer Science” by J. Barry DeRoos):

Ethics and values must play a role in computer science education. Simply equipping students with neutral tools and skills, which are to be used purely according to their personal whims and desires, fails to recognize the moral standards and democratic principles of American society. Such recognition helps learners to consider ethical values during application of computer skills. “One can’t guarantee that guidance will be accepted and followed, but it is irresponsible not to offer it.”

- “In the practice of computer science, a person’s moral and ethical values are critical to the relationships developed with fellow workers, the types of applications that are developed, the quality of the work done, and the general honesty and integrity of the person.”
- An ethical component of computer science education would address two possible reasons for illegal use of computers: (1) problems with moral vision of users; (2) rationalization “justifying” illegal activities. (Example: Some people who would not think of shoplifting a book from a bookstore readily make illegal copies of software.)
- “Because software piracy [is] a common behavior of ... students, it [is] an ideal topic to integrate into computer science courses.”
- Example from a college Software Piracy Policy: Because electronic information is volatile and easily reproduced, respect for the work and personal expression of others is especially critical in computer environments. Violations of authorial integrity, including plagiarism, invasion of privacy, unauthorized access, and trade secret and copyright violations constitute grounds for sanctions against members of the college community. Students should be aware of legal consequences that may accompany ethical deficiencies.

II. (“Ethical Problems in Computing” from Association of Information Technology Professionals):

- The dynamic nature of computer science education requires perpetual consideration of ethical principles. Because of its constantly changing nature, the area of computer technology is one that is difficult to assign a specific set of moral codes, although it is necessary that ethics be considered when making decisions in this area. Computing creates a whole new set of ethical problems, unique unto itself. Among such problems: (1) the unauthorized use of hardware; (2) the theft of software, (3) disputed rights to products, (4) the use of computers to commit fraud; (5) the phenomenon of hacking and data theft; (6) sabotage in the form of viruses; (7) responsibility for the reliability of output; (8) making false claims for computers; and (9) the degradation of work.
- By integrating ethical awareness in computer science courses, students can address such ethical questions as: (1) Is copying software really a form of stealing? (2) Are so-called “victimless” crimes ... more acceptable than crimes with human victims? (3) Does information on individuals stored in a computer constitute an intolerable invasion of privacy? Such questions demand that ethical principles be applied to their resolution because without the consideration of ethics, these gray areas can easily become completely black. Other topics posing ethical problems

include unauthorized computer entry, computer privacy, and the power that computer professionals wield because of their knowledge of computer systems.

III. (“Ethics of Technology” from Wikipedia)

• It is often held that technology itself is incapable of possessing moral or ethical qualities, since “technology” is merely tool making. But many now believe that each piece of technology is endowed with and radiating ethical commitments all the time, given to it by those who made it, and those who decided how it must be made and used. Whether merely a lifeless, amoral “tool” or a solidified embodiment of human values, “ethics of technology” refers to two basic subdivisions:

(1) The ethics involved in the development of new technology—whether it is always, never, or contextually right or wrong to invent and implement a technological innovation.

(2) The ethical questions that are exacerbated by the ways in which technology extends or curtails the power of individuals—how standard ethical questions are changed by the new powers.

In the former case, ethics of such things as computer security and computer viruses asks whether the very act of innovation is an ethically right or wrong act. Similarly, does a scientist have an ethical obligation to produce or fail to produce a nuclear weapon? What are the ethical questions surrounding the production of technologies that waste or conserve energy and resources? What are the ethical questions surrounding the production of new manufacturing processes that might inhibit employment, or might inflict suffering in the third world?

In the latter case, the ethics of technology quickly break down into the ethics of various human endeavors as they are altered by new technologies. For example, bioethics is now largely consumed with questions that have been exacerbated by the new, life-preserving technologies, new cloning technologies, and new technologies for implantation. In law, the right of privacy is being continually attenuated by the emergence of new forms of surveillance and anonymity. The old ethical questions of privacy and free speech are given new shape and urgency in an Internet age. Such tracing devices like RFID, biometric analysis and identification, and genetic screening all take old ethical questions and amplify their significance.

III. (Additional Rationale)

• “In an objective system ... any mingling of knowledge with values is unlawful, forbidden. But [the] ... ‘first commandment’ which ensures the foundation of objective knowledge, is not itself objective. It cannot be objective: it is an ethical guideline, a rule for conduct. True knowledge is ignorant of values, but it cannot be grounded elsewhere than upon a value judgment ...”

— Jacques Monod (In “Chance and Necessity” 1970)

• “The potential for abuse presents a formidable but vital task for schools, because they cannot just teach computer literacy; they must teach computer ethics.”

—Ken Komoski, executive director of Educational Products Information Exchange

In the end, a person’s ethical beliefs cannot be compelled. But good teachers beneficially can influence a student’s perception of ethical choices. They can inspire a clearer awareness and understanding of society’s values, of moral principles and of ethical issues and dilemmas. They can help nurture the intrinsic motivation of students in ways that guide them beyond self-serving interests toward decision making that prioritizes community welfare and recognizes the good and right thing to do.

The skills students learn in their computer science education can be used as a magnanimous wand or as a harmful weapon. Selfless, or selfish? Which motivation will prevail?

The inclination of computer science learners is as important as the competencies they are developing. That may be the most profound reason why ethical awareness must be infused in the computer science curriculum and nurtured in every classroom.