Notice the importance of inclusive CT work and inequity in district

Review CT-related groundwork

Identify leadership team

Develop shared understanding of CT

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**Equity Goal**
Greater inclusion of students who identify as Black and Latinx and students who have been identified as English language learners

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Iowa City Community School District (ICCSD) is a college-town district serving 14,500 students and is rapidly becoming more urban and diverse in its population and a growing tech hub in its own right within the state. ICCSD applied to participate in the National Science Foundation-funded *Developing Inclusive K-12 Computing Pathways for the League of Innovative Schools* (Inclusive CT Pathways) project to focus on developing a K-12 pathway that aligned computing courses already available within the district through the Project Lead the Way (PLTW) curricula as well through their K-8 science courses, which were recently aligned to *Next Generation Science Standards* (NGSS) entailing computational models of natural phenomena. Though Iowa City had robust, if limited, high school offerings in computer science (CS), these classes simply were not attracting a student demographic representative of the wider district.

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Iowa City Community School District (ICCSD) is a college-town district serving 14,500 students and is rapidly becoming more urban and diverse in its population and a growing tech hub in its own right within the state. ICCSD started with the data, pulling the then (2017) district’s latest enrollment numbers in its high school CS course offerings and examining enrollment in light of the wider district demographics. It quickly became clear some students (and some schools) were less representative than others.

During the first two years of the project (2018-20), a small group of teachers and administrators at ICCSD designed their Inclusive CT Pathways specifically around K-8 offerings, leveraging the PLTW model of hands-on computing aligned with NGSS Standards specific to computation.
A small team at ICCSD developed an initial draft of the Inclusive CT Pathways competency map. Competencies were identified by the District Development Team of four teachers, one part-time instructional design specialist, and a district level instructional design coach. They identified five key competencies: **Algorithms**, **Computational Models, Systems**, **Data**, and the **Impact of Computing**.

The ICCSD Inclusive CT Pathways document was developed with the [Iowa Computer Science Standards](https://csatd.org/curriculum/ia-standards) aligned with the [Computer Science Teachers Association Standards](https://csatd.org/) (CSTA) and [Iowa CORE Standards](https://www.csatd.org/) in mind. While ICCSD prioritized K-8 science integration, in Years 2 and 3, additional lessons developed in parallel by librarians were aligned to the [School Library Standards](https://www.csatd.org/) (more below). At the end of Year 1 (Spring 2020), the Pathways document was presented to a group of K-12 teachers for feedback. The focus group provided positive reactions to the map as a “single blueprint” pointing to the various grade-level integration points.

By the end of Year 1, the blueprint offered ICCSD a framework to ensure consistency and cumulativity in computational thinking (CT) integration from subject to subject across grade levels. Professional development opportunities for ICCSD teachers were specifically supported by PLTW trainings and district-level CT integration were funded through the state department of education incentive fund.

ICCSD offered PLTW at two elementary schools and two middle schools over the 2019-20 academic year. During the 2020-21 academic year, five schools in the district were selected to implement PLTW at a variety of grade levels, and the district specifically recruited a district-wide CS Specialist to support teacher PD and integration. Teachers reported implementing individual PLTW units, though challenges with COVID-19 in Years 2 and 3 slowed progress. Accordingly, in late Year 2 (Fall 2020), select ICCSD librarians worked in parallel to create a library of [CS/CT lessons for students in grades K-6](https://www.csatd.org/).
Reflection

What are some of the key takeaways for the district?

- As the district and wider community struggled with the ongoing challenges of COVID-19 in the second and third years of the grant, ICCSD made two key decisions:
  - First, to support teachers by distributing leadership and leveraging school-based librarians to create a database of CS/CT lessons for students in grades K-6.
  - Second, to center leadership (and prioritize CS and CT as a curricula offering) by appointing a district-level leadership position in CS/CT in Year 2.
- ICCSD well-leveraged Next Generation Science Standards (NGSS) to begin integrating CT into district science coursework but developing modeling activities for students was a substantial lift and assessing them (via rubrics and checklists) was likewise took time; PLTW offered the districts established curricular content but the coursework prioritizes coding more than integrative CT.
  - Science and NGSS represented a starting point for curricular integration on the K-8 level, but the district is now working to expand to math, English language arts, and social studies.
- Through the adoption of the the Digital Promise co-designed student empathy interview protocol, the formation of a district inclusive computing committee, and collaboration in the “Equity in the Driver’s Seat” Initiative, ICCSD took deliberate and pragmatic steps oriented towards changing classroom practice.

Opportunities

Following three years of work developing an Inclusive CT Pathway, ICCSD will next focus on:

- Increasing shared leadership capacity with library media specialists who have capacity to coach teachers.
- Aim for a clear articulation of where PLTW is being offered at the district level and what the implementation plan looks like moving forward.
- Create teacher-friendly and usable guides to the ICCSD Computer Science Standards Progression document and a 1-page overview document that can help teachers have a better understanding of the “Why?”