Coaching Teachers of *Exploring Computer Science*: A Report on Four Years of Implementation

**Technical Report**
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Introduction

In this technical report, we examine the implementation of a coaching model for teachers of the Exploring Computer Science course in Chicago Public Schools over a period of four academic years (from 2016-2017 to 2019-2020). We first provide a description of the coaching model and how it evolved over time. Next, we present findings from a descriptive analysis of data collected through logs of coaching interactions and surveys of ECS teacher coaches during the 2019-2020 school year. Coaching logs and survey data were also collected during the 2018-2019 school year and, where appropriate, we compare results across years. We then discuss the products that were produced by the coaching team to support the implementation of the model. Finally, we provide an overview of next steps for the coaching team in the 2020-2021 school year and beyond.

Background

The goal of the CS4All project in Chicago is to broaden participation in computing by providing a compelling and relevant computer science (CS) experience for all Chicago Public Schools (CPS) students. A major step toward this goal occurred when the Chicago Board of Education approved a policy in 2016 that made CS a graduation requirement for all high school students. The district adopted the Exploring Computer Science (ECS) curriculum and professional development as the means for ensuring that all high schools offer an introductory computer science course for students.

As part of the effort to engage all students with a high-quality computer science experience, the Office of Computer Science in CPS, in collaboration with the Chicago Alliance for Equity in Computer Science (CAFÉCS), spent the past several years developing and refining approaches to supplement the professional development of new ECS teachers. One of the primary means for accomplishing this is through the development of an integrated, scalable coaching model targeted at new ECS teachers. This project was called Accelerate ECS4All. At the beginning of the project in 2016, the Office of Computer Science identified four goals for Accelerate ECS4All: 1) Establish a robust coaching model for sustained support of teachers who are new to teaching ECS, 2) adapt the ECS professional development facilitator in development program into the coach in development program, 3) support the professional development of additional ECS teachers, and 4) broaden participation in computing. At the core of the Accelerate ECS4All project is the development of a robust, replicable, and scalable coaching model that will support the rapid expansion of ECS in CPS. This report presents evidence about the benefit of the coaching model for ECS teachers and students in Chicago. Specifically, the report seeks to
answer the following question: To what extent does the Accelerate ECS4All coaching model support teachers at improving their teaching practices?

Description of ECS Coaching Model

Coaching for teachers of Exploring Computer Science (ECS) was piloted during the 2016-17 school year. Five pilot coaches participated in a coaching professional development workshop and three of the coaches subsequently engaged in coaching during the year. The model was implemented in the 2017-18 school year with a small number of teachers and expanded in subsequent years. In the sections that follow, additional details about the evolution of the coaching model are described.

2016-17: Coach Professional Development and Pilot Coaching Sessions

The project began with professional development conducted by Gail Chapman, ECS developer, for the coaches at the beginning of the school year. An emphasis was placed on supporting teachers through a process of questioning to help guide teachers to recognize and develop their own pedagogical strategies for the classroom. This approach was based on the ECS professional development debrief process. The coaches developed and piloted a coaching protocol which consisted of a pre-visit conversation with the teacher, the visit, the post-visit debrief, and documentation of the visit. The coaches intentionally used the term “visit” instead of “observation” in order to reinforce to teachers that the purpose was not evaluative.

All coaches during this first year of the project were part-time. Coaches conducted one visit cycle for each teacher during the school year, coaching a total of 7 teachers. The process for scheduling coaching visits was done by staff in the computer science office in CPS, in communication with the coaches and teachers.

For each visit, coaches conducted a brief pre-visit phone conversation with the teacher. The pre-visit talk focused on the area of need designated by the teacher in the interest form. For the visit, the coach observed the entire class period, taking notes without interacting with the teacher or students. The classroom visit served as an opportunity for the coach to observe instructional choices and student experiences. After the class period ended, the coach and teacher debriefed about the experience, with the coach using questioning to promote a more reflective teacher mindset regarding lesson decisions and instruction. The post-visit debrief allowed the teacher to unpack what happened through questions and prompts by the coach. Finally, there was an agreement for further contact, either with another visit or a check-in through email or a phone call.

2017-18: Implementing the Model

For the 2017-18 school year, the computer science office in CPS hired one of the part-time coaches from the previous year as a full-time coach for ECS teachers. This full-time coach also conducted professional development for the part-time coaches. The protocol remained the same: a pre-visit planning call, the visit, a post-visit debrief, and documentation. In a change from the
pilot year, the coaches and teachers scheduled their visits directly with one another (no longer using staff in the computer science office).

The full-time coach worked with 13 first year ECS teachers, while the four part-time coaches worked with two teachers each. The full-time coach averaged 3–5 coaching visits per teacher each semester, while the part-time coaches averaged 2–3 per semester. Part-time coaches were constrained by their own teaching and school schedules as well as the coachee teacher’s schedule, which limited the number of interactions and led to gaps in service. As a result of these constraints, a decision was made to shift the model to only full-time coaches.

2018-19: Expanding the Coaching Model

In the 2018-19 school year, a second full-time coach was hired to support ECS teachers and part-time coaching was discontinued. Two full-time coaches allowed the office of computer science to increase the number of ECS teachers supported and to serve a greater variety of schools: geographic location, socio-economic, and type of high school. Each coach worked with 18-20 ECS teachers and averaged 6 coaching visits per teacher each semester.

The professional development for coaches changed during this year. The coaches engaged in the Jim Knight model of coaching, which led to a shift in the approach to coaching from one based largely on the ECS professional development model to a dialogic model of coaching in which the coaches share their expertise with teachers. The debrief is focused on student learning goals rather than teacher lesson goals.

In this year, the coaches also worked collaboratively with the computer science integration specialists in the district to schedule meetings with school leaders and coachee teachers to set expectations for the year. The coaching protocol was expanded to include goal setting, videorecording lessons, modeling lessons, collecting and analyzing real time student classroom data, and peer teaching visits to other schools. To capture the new activities, a coaching log was developed that coaches completed after each interaction. The coaches logged over 200 interactions each.

2019-20: Refining the Coaching Model

For the 2019-20 school year, the two full-time coaches worked with 54 total teachers and logged over 440 coaching interactions. The school year was interrupted several times, first due to the teachers’ strike in the fall semester and then in the spring semester due to the COVID-19 pandemic, which led to the district moving to remote learning for the remainder of the year. As a result, in-person coaching was no longer possible, and the coaches attempted to continue to connect with teachers through remote coaching.

The coaches continued to engage professional development based on the Jim Knight model of coaching. The coaching protocol was revised to include school team meetings as well as relationship-building meetings with coachee teachers, classroom culture and climate visits, learning walks, and a Coaching Café (group discussion/coaching sessions focused on pedagogical topics).
Trends Across Years

1. The part-time coaching model did not work. There were too many logistical barriers to creating momentum between the coach and the coachee.

2. There was a significant shift from the ECS professional development debrief model to a dialogic model based on Jim Knight’s approach to instructional coaching. The coaches participated in two years of Jim Knight professional development. The coaches reported that this professional development was instrumental in their transition from teachers to coaches.
   a. A key development was centering the conversation around the reality of the classroom through video recordings or other data.
   b. Coaches and teachers worked to develop an achievable goal for students and then matched a teaching strategy to reach that goal.
   c. Coaches collected data on progress toward the goal and discussed adjustments.

3. The types of interactions expanded from the initial model of pre-visit, visit, post-visit debrief to include a variety of other types of coaching interactions. The types expanded further with remote coaching. Some of the remote coaching techniques may persist when instruction returns to face-to-face.

4. Teacher content knowledge, student engagement, and classroom culture have remained a consistent set of needs for teachers to address across years (see below). The coaches are designing a Unit 0 for ECS to address the needs they have seen across teachers in establishing a classroom culture which supports the equity and inquiry goals of the curriculum.

5. Coordination with school leadership and integration specialists is helpful, but difficult to coordinate.

6. It was important to maintain confidentiality in the partnership between the coach and the teacher. Therefore, conversations with school leaders about the coaching process were limited to broad discussions of progress, without divulging specific details.

7. The evolution of the coaching model over time was informed by the feedback from teachers about their experiences with coaching.

Coaching Interactions Log Data

The coaching logs for 2019-2020 included interactions with 54 different teachers across 34 different CPS high schools. This was an increase over the previous year, when coaches interacted with 38 teachers across 28 different high schools. Some teachers had only one interaction with a coach. Others had many. One teacher, for example, had 50 coaching interactions. There was a total of 441 interactions during the school year (this was a 32% increase over the previous year). Interactions varied in length from 15 minutes to 3 hours. The average length of interactions was about 40 minutes. See Table 1 for a comparison of the coaching interactions across the two school years.
Table 1. Coaching Interactions by Year

<table>
<thead>
<tr>
<th></th>
<th>2018-2019</th>
<th>2019-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Teachers</td>
<td>38</td>
<td>54</td>
</tr>
<tr>
<td>Number of Schools</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td>Interactions per Teacher (Range)</td>
<td>1 to 26</td>
<td>1 to 50</td>
</tr>
<tr>
<td>Total Number of Interactions</td>
<td>335</td>
<td>441</td>
</tr>
</tbody>
</table>

Most coaching interactions were in-person or through pre-visit emails (96%) with a small number (4%) by phone or online (see Figure 1).

Figure 1. ECS Coaching Interactions by Platform

Interaction types varied. Common interaction types included planning sessions, classroom visits, and post-visit debriefs (see Figure 2).

Figure 2. ECS Coaching Interactions by Type
About half of the interactions were about specific ECS units (n=211, 48%). Of these, the majority were about Unit 2 or 3 (75%). Only 2% of interactions were about Unit 4 or 5 and none were about Unit 6 (see Figure 3). This may be partly explained by the pace of instruction over the course of the year as some percentage of ECS teachers do not progress to the later units in the curriculum. The onset of the pandemic also coincided with the approximate time when many teachers were likely to be starting Unit 4. Additionally, Units 2 and 3 are the first exposure for new ECS teachers to some of the more advanced concepts in the curriculum. Unit 2 is the first exposure to more advanced CS concepts like algorithms and Unit 3 covers learning html and learning to use a coding application.

Figure 3. ECS Unit Covered During Coaching Interaction

Coaching Area of Focus

Coaching interactions often included one or more areas of focus, which were driven by the teachers with guidance from the coaches. About 56% of interactions reported an area of focus (n=250). The initial list of coaching areas of focus was developed by one of the coaches and a computer science faculty member at a local university. The coaches then mapped the areas of focus to the district’s teacher evaluation system benchmarks. The two most common areas of focus for the coaching interactions were student engagement and computer science content. Effective collaboration and equitable classroom culture were also somewhat common areas of focus. The most commonly cited areas of focus were consistent with the previous year of coaching log data, in which keeping students engaged was the most commonly cited area (35%), followed by computer science content (15%) and establishing an equitable classroom (12%). This suggests that ECS teachers consistently need support in these areas.

The “Other” category for reporting the area of focus for coaching interactions captured a variety of additional areas and was analyzed for themes. Prevalent themes from this category included overall classroom culture and climate (e.g., establishing classroom norms; 17 interactions), lesson planning and support (9), the coaching process and supports (6), and goal setting (4).
Teacher Actions of Progress, Key Discussion Points, and Next Steps

A subset of the interactions recorded in the coaching log included teacher actions of progress, key discussion points, and/or next steps.

*Actions of Progress.* About 17% of interactions in the coaching logs included teacher actions of progress (n=73). These were steps that teachers had taken toward progressing in the areas of focus that they were working on in collaboration with their coaches. Common actions included collaboration (15), journaling (9), student engagement (6), and routines/norms (5). The eight most common actions of progress are listed below.

- Collaboration (15)
- Journaling (9)
- Student engagement (6)
- Routines/norms (5)
- Pacing (4)
- Equitable practices (4)
- Real world connections (4)
- Classroom culture (3)

*Key Discussion Points.* About 60% of interactions included key discussion points. Among the frequently recorded key discussion points were student engagement (48), communication and presentation skills (28), questioning and discussion (20), and collaboration (20). Additionally, some interactions included discussions about specific units of ECS. Unit 3, which is about web design, was the most frequently discussed unit of ECS. The twelve most common discussion points are listed below.

- Student engagement (48)
• Communication/presentation skills (28)
• Questioning/discussion (20)
• Collaboration (20)
• Assessment (18)
• Lesson planning (18)
• Computer science content (17)
• Community building (15)
• Culture and climate (15)
• Computer science/ECS resources/supports (15)
• Inquiry/equity strategies (10)
• Pacing (7)

Discussion Points related to specific ECS units.
• ECS Unit 1 (5)
• ECS Unit 2 (7)
• ECS Unit 3 (13)
• ECS Unit 4, 5, or 6 (5)

Next Steps. Over half of the interactions (54%) included next steps. Common next steps for teachers and coaches were lesson planning, classroom visits, and video recording lessons for review with coaches. The six frequently logged next steps are listed below.

• Lesson planning (35)
• Classroom visit (34)
• Video recording lessons (21)
• Debrief activities (15)
• Unit-specific actions (14)
• Learning walk (13)

Coaching Survey Data – Summer 2020

In addition to the coaching log data, a small sample of teachers (n=15) who participated in coaching completed a survey at the end of the school year about their experience with coaching (see Appendix B for the complete survey). Because COVID-19 was disruptive to the normal operations of the district in the spring of 2020, the survey included some items that asked teachers about their coaching experience prior to COVID-19 and some items asked specifically about coaching after the disruption from COVID-19.

This survey shared some items with a similar survey that was administered at the conclusion of the 2018-19 school year. Where appropriate, we compare results from the current survey with the results from the previous year.
Coaching Areas of Focus

Teachers were asked which areas of focus they worked on with their coach (respondents could select multiple areas of focus). Most respondents indicated that they worked on computer science content (87%) and many also indicated that they worked on student engagement (67%). Almost half worked on productive questioning (47%) and/or effective collaboration (47%). Other areas of focus that were common were equitable classroom culture (40%), appropriate feedback (40%), time management (33%), and student presentations (20%).

Respondents also indicated in which area of focus they made the most progress (see Figure 4). The majority of teachers (53%) indicated that they made the most progress in computer science content. Several teachers made the most progress on effective collaboration.

Figure 4. Coaching Area of Focus in Which Teachers Made the Most Progress

Teacher Confidence in Implementing ECS

Figure 4 shows the extent to which teachers were confident in their ability to implement strategies related to the three strands of ECS: computer science concepts, inquiry, and equity. None of the respondents chose the “not confident at all” option for any of the three strands. A higher percentage of teacher respondents (27%) indicated that they were only somewhat confident in their ability to implement strategies related to computer science concepts compared to the inquiry and equity strands (see Figure 5). This finding may explain why over 70% of teachers reported that computer science content is an area where they still need to focus on with their coach.
Teachers were also asked how participating in coaching has improved their confidence in implementing ECS. Three themes emerged from this open-ended question. Teachers mentioned that it helped with their confidence with the computer science content, provided them with a resource for asking questions and getting support, and provided encouragement. A teacher who felt “very confident” across all three strands of ECS stated:

“It has tremendously increased my confidence in implementing ECS. The coaches did exactly what they were supposed to do. They met me at my skill level and provided the assistance necessary to help me to succeed.”

Another teacher who felt “confident” across all three strands stated:

“I am a new teacher and Computer Science was new to me as well but partnering with [my coach] made me feel extremely confident that I could teach ECS and that my students would learn.”

Teachers were also asked to provide an example of implementing something that they learned through coaching. Responses touched on a variety of different areas, including the importance of attending to equity and inquiry in teaching ECS, time management, student engagement and participation strategies, lesson planning/modifications, and collaboration strategies. One teacher, for example, stated:

“This is more along the lines of student engagement and presentations, but [my coach] gave me great advice to have students write critiques to each other about their work during gallery walks. I used that practice all year and worked on getting students to provide thoughtful Glows and Grows.”

Another teacher noted:

“I learned how to allow the students to effectively collaborate. I grouped my students the way my coach suggested.”
Teachers were also asked to indicate their level of agreement (from “strongly disagree” to “strongly agree”) with six statements about coaching during the school year (prior to COVID-19). The sixth statement asked teachers to indicate whether the teacher strike, which occurred in the fall of 2019, had been disruptive to coaching.

The responses were very positive overall. For example, even with the disruption from the teacher strike and COVID-19, respondents overwhelmingly “agreed” or “strongly agreed” that the number of coaching interactions was suitable (93%). The majority of respondents also indicated that the mix of coaching activity types was appropriate (74%) and the logistics of arranging the coaching visits was easy (94%). These positive findings were consistent with the survey results from 2018-19. A notable change from the previous year was a decrease in the percentage of teachers who indicated that they wanted more coaching visits during the year (50% agreed or strongly agreed in 2018-19 decreased to 40% in 2019-20). This is consistent with the finding that there were, on average, more coaching visits this year. The full results are shown below in Figure 6.

Figure 6. ECS Teachers’ Level of Agreement with Statements About Coaching

All respondents indicated that they found the coaching support somewhat beneficial (20%) or very beneficial (80%). This was an increase in positive responses from the previous year, when 67% of respondents found the coaching very beneficial.

The survey also included an item asking teachers how the ECS coaching supports could have better met their needs. Teacher responses fell into three categories: more coaching interactions, the development of a professional community of ECS teachers to foster learning from peers, and diverse learner accommodations for ECS.

Regarding the creation of a community of ECS teachers, one respondent commented:
“I would like to build out more of an online community that is led by coaches, but where other teachers make contributions as well.”

Another respondent noted the need for diverse learner accommodations specifically during remote learning:

“More support in terms of Diverse Learner modifications and accommodations and remote teaching.”

Another indication that the ECS coaching was well-received by teachers was the percentage of respondents who indicated that the coaching support they received had a positive impact on their computer science instruction. As shown in Figure 7 below, 73% of respondents strongly agreed and the remaining 27% agreed that coaching had a positive impact. This finding is a slight improvement over the survey results from the previous year, in which 67% strongly agreed and 33% agreed.

The majority of respondents (94%) similarly indicated that participating in coaching activities was worthwhile. This was a slight decline from the previous year, in which 100% of respondents agreed or strongly agreed that time spent on coaching activities was worthwhile. This slight decrease from the previous year may be due to teachers feeling particularly protective of their time as a result of having to engage in remote teaching for the second half of the school year.

Figure 7. Teacher Perspectives about Coaching Support

Remote Coaching

The survey included several items that were designed to help understand if and how teachers were experiencing coaching during the months of remote learning that occurred in the spring 2020 semester due to the COVID-19 pandemic. The district’s decision to move to remote learning happened abruptly and, as a result, teachers and coaches were adapting to this new learning context in real time. Also, the coaching team assumed additional responsibilities during the spring semester.

Teachers were asked what factors contributed to their decision whether to participate in remote coaching. Of the 15 respondents, six (40%) did not participate in remote coaching. The two main reasons were being overwhelmed with remote teaching and lack of awareness that remote
coaching was available. Among those that did participate, factors included wanting assistance with remote teaching, having a strong relationship with the coach prior to remote teaching, and wanting to continue to have support in implementing ECS.

The survey also included an item asking teachers whether or not remote learning disrupted the momentum of coaching services. As shown in Figure 8 below, a large percentage of teachers indicated that remote learning was disruptive to the momentum of coaching (60% agreeing or strongly agreeing).

Figure 8. Teacher Agreement that Remote Learning Disrupted the Momentum of Coaching

Respondents were also asked about the greatest challenges during remote teaching. The two most common challenges cited were student engagement/participation issues and technical issues with teaching remotely. Teachers also indicated that the kinds of coaching supports that would be beneficial during remote teaching were general support for teaching in an online environment, one-to-one coaching sessions, and opportunities to connect with and learn from other ECS teachers (such as a professional learning community).

Some example quotations from teachers about the challenges during remote teaching:

“Student participation and lack of resources students had to the technology.”

“I feel that a lot of the students had technical issues.”

“Remote teaching was an extremely stressful experience for me - I never felt like I had clear expectations of what I was supposed to be doing with my students (e.g., how much synchronous learning vs. asynchronous learning), and the grading guidelines kept changing. In addition to lesson planning and creating online material I also had to spend a lot of time reaching out to students and their parents to keep them participating in the class.”

**Summary**

Overall, teachers were very positive about their experiences with coaching. This was a consistent finding across both years that the survey was administered (2018-19 and 2019-20). A theme
from the survey data was that teachers felt least confident in their ability to implement strategies related to computer science content and that this was an area where coaching had been particularly beneficial. This is perhaps not surprising given that many ECS teachers in Chicago are experienced teachers but are not experienced computer science educators and therefore may feel more confident with implementing pedagogical strategies associated with the curriculum than with the computer science content itself.

**Description of Coaching Products**

*Instructional Coaching Guide.* As part of the Accelerate ECS4All project, the coaches in the office of computer science developed an Instructional Coaching Guide. The purpose of the guide is to provide a comprehensive description of the model of coaching for reference and for onboarding new coaches. It includes the philosophy and mission of coaching, an explanation of the dialogic model of coaching, a timeline of expected coaching activities over the course of a school year, a detailed list of the types of coaching interactions (e.g. relationship-building meeting, post-visit debrief, etc.), responsibilities for reporting coaching data, and detailed guidance on several coaching activities (including goal setting and conducting post-visit debriefs). Additionally, the guide includes a number of resources (templates, questionnaires, checklists, and rubrics) to facilitate the coaching process and ensure consistency in coaching.

*Coaching Theory of Change.* The Accelerate ECS4All coaches, in collaboration with researchers from The Learning Partnership and the CAFÉCS leadership team, also developed a coaching theory of change in the spring of 2020 for the 2020-2021 school year that outlines the current state of coaching for ECS, identifies key barriers and assets, lists strategies and tactics being used to further strengthen the coaching model, lists anticipated progress milestones, and the desired ends of the project (see Appendix A for the complete ECS Coaching Theory of Change). The coaches began to collect data that addressed progress milestones prior to the pandemic, including student self-reported data on their engagement in the classroom and the extent to which their teacher respects different perspectives and promotes discussion. The desired ends of the project range from creating a robust, dynamic coaching model to mentoring new coaches and increasing the retention of ECS teachers.

**Next Steps**

*Short-Term Next Steps.* During the 2020-2021 school year, the coaching team is developing several additional strategies for supporting ECS teachers. These include the Coaching Café, the Teachers’ Lounge, and a peer coaching model based on the GROWTH framework. The Coaching Café is an informal but structured discussion group for teachers (similar to a professional learning community) that is focused on pedagogical topics. The Teachers’ Lounge is designed to provide opportunities for small groups of ECS teachers to collaborate with the coaches on best practices and teaching strategies regarding specific ECS lessons and computer science content. Teachers who participate in the peer coaching activity partner with another ECS teacher and meet monthly to discuss their practice, using the Goals, Reality, Options, Will,
Tactics, Habits (GROWTH) framework to guide their collaborative work. All of these additional supports for teachers were developed in response to teacher feedback indicating that they wanted additional opportunities to work with and learn from their colleagues.

Long-Term Next Steps. The longer-term next steps for the Accelerate ECS4All coaching project are derived from the coaching theory of change document. These next steps build upon the initial actions taken to address aspects of the theory of change during the 2019-2020 school year (outlined above). Overall, the next steps in the project will provide the coaching team with additional evidence about the efficacy of coaching and the potential impact for teachers and students. For example, the coaching team will expand the effort to collect student self-reported data on their engagement and their teacher’s ability to promote discussion. Student self-reports will be collected multiple times over the course of the school year to assess the desired outcome of increasing teacher implementation of productive questioning techniques and techniques for engaging students.

The team will identify (or develop, if necessary) a measure of teacher self-efficacy to assess the extent to which there is an increase in teacher self-efficacy in computer science teaching and computer science identity. This will be followed by an examination of the relationship between teachers’ self-efficacy and their implementation of teaching strategies.

The coaching team will also begin to assess the impact of strategies and tactics to increase the productive contact with teachers across the school year. For example, the team is developing remote coaching strategies (such as group coaching) to complement in-person coaching activities, continuing to engage in coaching professional development activities, and developing a “Unit 0” curriculum for teachers that will serve as a foundation for establishing a culture and climate of student engagement in learning in the classroom. Data from the coaching logs, teacher surveys, and other documentation of the implementation of teaching strategies will be used to assess the impact.

The collected data from these various measures will also be used to assess several of the longer-term desired outcomes in the theory of change: 1) creating a robust, dynamic coaching model and 2) improving retention of computer science teachers.

A final longer-term outcome is to build the capacity of the ECS coaching program by successfully mentoring new coaches. Tactics associated with this outcome include the continual refinement of the coaching guide, mentoring and observing new coaches, and the creation of a professional learning community for coaches.

Acknowledgement
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Appendix A
ECS Coaching Theory of Change
The purpose of this 2020-21 CAFÉCS project is to support and research the role of instructional coaching in supporting novice ECS teachers to implement teaching strategies core to the ECS curriculum.

**Current State (April 2020)**

This project intends to support teachers to improve their CS content knowledge and instructional practices.
- 2 full time instructional coaches
- 1 unfilled part-time coaching position
- Instructional practices: Equity and Inquiry
- Number of ECS teachers:
- Number of High Schools:
- Current assessment of how ECS teachers are currently teaching ECS [most prevalent area of focus: student engagement]

**Barriers & Assets**

This project has identified 10 key barriers:
1. Limited funds to support district coaches
2. Challenges scheduling and meeting with teachers
3. Geography of schools
4. Variability in school cultures (huge range of HS organizations, principal expectations, schedules, CS programming)
5. No systematic way to measure improvements in teaching (so we can characterize the overall growth of teachers across the program)
6. There are issues related to evaluating teachers
7. Teacher attrition
8. Wide range of teacher background
9. New teacher support
10. Low classroom management for new teachers

This project has identified 9 key assets:
1. 2 instructional coaches (former ECS teachers and current ECS facilitators)
2. Tied ECS professional development
3. Teacher demand for coaching
4. Leadership support
5. Coaching embedded in the department
6. Coaching manual
7. Research-based Coaching protocol and coaching materials
8. Coaching log process
9. PD for instructional coaches provided by Jim Knight

**Strategies**

This project is using 6 strategies:
1. Adapt and Use a partnership model of coaching
2. Develop remote coaching strategies (address geography and scheduling)
3. Develop measures to assess the impact of the coaching model on knowledge, beliefs, and practices
4. Prioritize teachers for coaching and set expectations.
5. Develop a model for onboarding and continuous coaching development.
6. Provide targeted support for establishing and maintaining classroom climate.

**Tactics**

This project has identified 6 tactics:
1a. Use the impact cycle to match student-level goal with teaching strategy
1b. Develop an instructional playbook
1c. Document implementation of teaching strategies
2a. Coach on growth strategies for teachers during remote learning
2b. Explore which aspects of coaching could be done remotely (e.g., pre- and post-observation meetings)
3a. Identify self-efficacy scale (at beginning of year and at the end of each semester)
3b. Teacher feedback survey at the end of each semester
3c. Develop a teacher reflection survey for the coaches (at the end of each quarter)
4a. Refine the document on expectations and roles for coaching
4b. Coordinate with school and school administration to identify teachers for coaching
4c. Periodic check ins with school administration
5a. Refinement of the coaching handbook
5b. Mentoring and coach observations
5c. PLC for coaches (reserve time)
5d. Professional development for coaches
6. Development and support for Unit 0

**Progress**

This project has identified 6 progress milestones:
1. Student self-reports of engagement increase over the course of the school year.
2. Student self-reports of Confer increase over the course of the school year.
3. The development or identification of a teacher survey measure to assess self-efficacy.
4. Remote coaching increases the productive contact with teachers
5. Initial meeting with school administration can facilitate initiation of coaching early in the school year.
6. Consistently meet as coaching PLCs

**Desired Ends**

This project has identified 7 desired outcomes:
1. Increase teacher implementation of Productive questioning techniques and techniques for Keeping students engaged in learning.
2. Improve classroom culture and climate as a foundation to support student engagement in learning.
3. Increase teacher self-efficacy in computer science teaching and computer science identity.
4. Examine the relationship between self-efficacy and implementation of teaching strategies.
5. A robust, dynamic coaching model
6. Successfully mentor new coaches into the ECS coaching model.
7. Increase retention of teachers in teaching CS.

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Appendix B
ECS Coaching Supports and Teacher Practices Survey
SY19-20 EOY Coaching Supports and Teacher Practices Survey

You are being sent this survey because you were eligible for and/or participated in coaching activities this school year. The information gathered in this survey will help us better support teachers in the future and to fine tune our coaching protocols. Thank you for all that you do.

* Required

1. Teacher Name

________________________________________

2. Who was your coach?

* Mark only one oval.

☐ Don Yanek
☐ Valerie Curry

3. 1. Which factors contributed to your decision to participate in coaching this year? (Mark all that apply) *

Check all that apply.

☐ Learned about coaching during ECS PD
☐ My administration encouraged me
☐ The opportunity to partner with a coach
☐ Recommended by a colleague
☐ Wanted support for CS content / Practices
☐ Wanted support on equity
☐ Wanted support on inquiry

Other: ____________________________________________________________
4. 2. Which areas of focus did you work on with your coach? (Mark all that apply) *

Check all that apply.

☐ Student engagement
☐ CS content
☐ Equitable Classroom Culture
☐ Productive questioning
☐ Effective collaboration
☐ Appropriate feedback
☐ Student presentations
☐ Time management
Other: ☐ ____________________________

5. 3. In what area of focus do you feel you made the most progress? *

Mark only one oval.

☐ Student engagement
☐ CS content
☐ Equitable Classroom Culture
☐ Productive questioning
☐ Effective collaboration
☐ Appropriate feedback
☐ Student presentations
☐ Formative assessments
☐ Time management
☐ Other
6. 4. Which aspects of the coaching partnership helped you grow in that area of focus? (Mark all that apply) *

Check all that apply.

☐ Opportunities to reflect on your practice
☐ Opportunities to plan lessons
☐ Opportunities to work with your coach as a partner
☐ Opportunities for you to make decisions about instructional strategies
☐ Resources and supports provided by your coach
Other: ☐

7. 5. Provide an example of implementing something that you learned through coaching. *

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

8. 6. Which areas do you feel you still need to focus on? (Mark all that apply)

Check all that apply.

☐ Student engagement
☐ CS content
☐ Equitable Classroom Culture
☐ Productive questioning
☐ Effective collaboration
☐ Appropriate feedback
☐ Student presentations
☐ Formative assessments
☐ Time management
Other: ☐
9. 7. Which other supports would be beneficial for you to progress in that area of focus? (Mark all that apply) *

Check all that apply.

☐ Collect and use data to inform instructional decision-making
☐ Internal and external learning walks to observe and partner peers
☐ Discuss research on current practices in computer science education
☐ Support for universal design, especially for diverse learners
☐ Participate in a professional learning community
☐ Participate in CS education conferences

10. 1. At this point, how confident are you that you are able to implement strategies related to the three ECS strands? *

Mark only one oval per row.

<table>
<thead>
<tr>
<th></th>
<th>Not at all confident</th>
<th>Somewhat confident</th>
<th>Confident</th>
<th>Very confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inquiry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer science concepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. 2. How has participating in the coaching partnership improved your confidence in implementing ECS? *
Feedback on Coaching (Prior to COVID-19)

12. Please indicate your level of agreement with the following statements about coaching PRIOR to COVID-19.

Mark only one oval per row.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree / Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of coaching interactions this year was suitable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The mix of coaching types (e.g., planning sessions, in-classroom lessons, video observations, etc.) was appropriate.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>The logistics of arranging the coaching visits were easy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The cycle of pre-classroom visit, classroom visit, and post-visit debrief was an effective structure for the coaching interaction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I wish there would have been more coaching visits this year.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The teacher strike disrupted the momentum of coaching services.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. 2. How would you rate the benefits of the coaching support you received prior to COVID-19? *

*Mark only one oval.*

- [ ] Not at all beneficial
- [ ] A little bit beneficial
- [ ] Somewhat beneficial
- [ ] Very beneficial

14. 3. How could ECS coaching supports have better met your needs? *


15. 4. Due to your participation in coaching prior to COVID-19, please indicate your agreement with the following statements: *

*Mark only one oval per row.*

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree / Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The coaching support I received had a positive impact on my computer science instruction.</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>The time I spent participating in coaching activities were worthwhile.</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>
16.  1. Remote learning disrupted the momentum of coaching services. *

Mark only one oval.

- [ ] Strongly Agree
- [ ] Agree
- [ ] Neither Agree / Disagree
- [ ] Disagree
- [ ] Strongly Disagree

17.  6. What factors contributed to your decision whether to participate in remote coaching this year? *

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

18.  2. What have the greatest challenges been for you during remote teaching? *

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
19. 3. Which of these has been helpful to you during your transition to remote teaching? (Mark all that apply) *

Check all that apply.

☐ ECS office hours
☐ Coach availability
☐ Small group sessions (Coaching Cafe)
☐ ECS teacher Google Classroom
☐ 1:1 sessions
☐ Supports for unplugged activities

20. 4. What types of COACHING supports would be helpful during remote teaching? *

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

21. 5. What OTHER supports would be helpful for you during remote teaching? *

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

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