**Policy Window in a Pandemic:
How a Computer Science RPP Fostered Equity in Credit Recovery**

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Abstract

The Chicago Alliance for Equity in Computer Science is a research-practice partnership that is working to broaden the participation of Chicago Public Schools' students in computer science. For this study, we applied the multiple streams approach from theories of the policy process (Kingdon, 1995; Zahariadis, 2014) to explain how the COVID-19 pandemic helped open a policy window for the continued use of synchronous online instruction during the implementation of an equity-centered computer science credit recovery option in Chicago.

Objectives

The Chicago Alliance for Equity in Computer Science (CAFÉCS) is a research-practice partnership (RPP) among Chicago Public Schools (CPS), DePaul University, Loyola University, The Learning Partnership, and the University of Illinois Chicago. To ensure that all students in Chicago participate in engaging, relevant, and rigorous computing experiences, CAFÉCS addresses problems of practice through research and development that increases opportunities for all students to pursue computing pathways and prepares all students for the future of work. In 2016, CPS made computer science a high school graduation requirement: all students, starting with the 2020 graduating class, must take and pass a minimum of one credit (equivalent to one year) of computer science coursework. The graduation requirement means that it is critical to ensure that all CPS students successfully complete an introductory computer science course, and students who fail the introductory course need a viable second chance to earn the credit.

The main objectives of this research were to document the challenges and opportunities associated with CAFÉCS supporting change in CPS and to study the entrepreneurship of computer science idea champions who have engaged in local efforts to broaden participation in computing. We applied the *multiple streams* approach (Kingdon, 1995) to frame our analysis on how the COVID-19 pandemic helped open a policy window for the continued use of synchronous online instruction in Chicago. This paper represents a preliminary interpretation of data collected as part of an ongoing study of the design and implementation of a newly developed hybrid (in-person and online) version of an equity-centered computer science credit recovery course.

CPS's Office of Computer Science adopted the Exploring Computer Science (ECS) program as the cornerstone of its CS4All initiative. Developed by researchers at UCLA and the University of Oregon, ECS combines curriculum with professional development to “democratize computer science knowledge for all students” (Margolis, et al., 2011, p. 140). The ECS program emphasizes three strands of computer science pedagogy as being especially critical for broadening participation in computing: computer science concepts (i.e., computer science content and computational practices that go beyond programming), inquiry-based learning (i.e., a student-centered approach to teaching and learning that fosters scientific investigation), and equity (i.e., assignments and instruction that are culturally responsive and meaningful for diverse students). Also central to the curriculum design of ECS are activities aimed at building a classroom community of collaborative learners.

Since late 2018, CAFÉCS has supported the development of a hybrid version of the ECS program to be used for credit recovery within CPS. The need for credit recovery course options arose from the district's enactment of a computer science graduation requirement in 2016. While

prior research demonstrated that the failure rate of ECS was in line with other CPS courses (McGee et al., 2018), members of CAFÉCS recognized that students who failed the class needed efficacious options to recover the required credit. Furthermore, CAFÉCS's study on the ECS failure rate identified some trends that were troubling from an equity perspective: the students most likely to fail ECS were African American and Latinx boys (McGee et al., 2018).

The hybrid ECS course was designed specifically with the goal of creating a more equitable form of credit recovery in the nation's third-largest school district. The course developers focused on identifying barriers to participation in credit recovery for students who failed ECS and sought to design a course that would provide the necessary elements to foster student success. Hybrid ECS, as designed, allows for greater flexibility—which benefits students who have work or family commitments during the summer—and serves to recreate the equity-focused, inquiry-based learning activities of in-person ECS, in a mostly online format. A major constraint on the design and implementation of hybrid ECS that quickly emerged for the developers was CPS's policy on acceptable uses of technology. Under this policy, the district's teachers were prohibited from engaging in online instruction via synchronous collaboration tools (e.g., Zoom or Google Meet). The developers initially attempted to design the course in a way that compensated for the lack of synchronous instruction through scaffolded asynchronous activities. However, the first pilot evidenced the extent to which supporting struggling students' work was extremely challenging when the remote learning was primarily asynchronous.

Following the first pilot of hybrid ECS, members of CAFÉCS set about developing a strategy for shifting the district's acceptable use policy; specifically, CAFÉCS developed a policy brief to make the case for synchronous online instruction in hybrid ECS and met with district leaders to advocate for a policy change. In the midst of this advocacy work, however, the

acceptable use policy was suddenly changed by the district as schools closed in response to the COVID-19 pandemic and CPS pivoted to remote learning for all students. The crisis of COVID-19 served to create an opportunity for CAFÉCS to advance its equity goals: Members of CAFÉCS sought to capitalize on CPS's widespread use of remote learning during the 2019-20 and 2020-21 school years to advocate for sustaining the use of synchronous collaboration tools for credit recovery post-pandemic.

For our analysis, we gathered artifacts and sections of interview transcripts related to CAFÉCS's piloting of hybrid ECS and efforts to shift the acceptable use policy. These data were used to reconstruct a basic timeline of events. We then coded the data, applying concepts from multiple streams theory to understand how the pandemic opened up an opportunity to allow synchronous online instruction for credit recovery and the entrepreneurship that ensued. In the language of the multiple streams approach (Kingdon, 1995), the closure of schools and immediate shift to remote learning was a *focusing event* that opened a *policy window* and brought attention to the constraints of asynchronous remote instruction. According to the multiple streams approach, when policy windows (or opportunities for action on a given problem) open, adroit policy advocates couple the three streams of *politics*, *problems*, and *policy* to advance their goals. We applied this framework to illustrate how members of CAFÉCS worked to couple the problem of asynchronous remote credit recovery with the shifting politics of the pandemic and the solution of continuing synchronous online instruction beyond the 2020-21 school closures.

Theoretical Framework

The multiple streams framework was first conceived by John Kingdon (1995) during the 1980s. Central to the multiple streams approach is the concept of ambiguity in policy making.

Ambiguity refers to the idea that there are many ways to think about the same set of circumstances or phenomena (Zahariadis, 2014). Conditions of ambiguity mean that policymakers often don't really know what the problem is—problem definitions can be vague or shifting. Ambiguity also makes it difficult to distinguish between relevant and irrelevant information. Policymakers, therefore, are faced with making sense of a world that is only partially comprehensible, and identifying the solution/s that will yield the greatest net benefits can prove challenging. Another building block of Kingdon's multiple streams approach is the significance of temporal order. In order to overcome conditions of ambiguity, "decisions are made by allocating attention through activating or overcoming temporal constraints and biases" (Zahariadis, 2014, p. 28). Essentially, what and when policymakers pay attention to is critical. And the decisions that are made are impacted by both energy load (the resources available to address the problem) and problem load (the number of problems being considered at one time).

Embedded in the multiple streams framework are three assumptions (Zahariadis, 2014):

1. Individual attention/processing is serial; systemic attention/processing is parallel.
2. Policymakers operate under time constraints.
3. The streams (problems, policies, and politics) flowing through a policymaking system are independent.

Regarding the first of these assumptions, cognitive limitations mean that people can only attend to one problem at a time. Consequently, the number of problems under consideration by policymakers at any given time is relatively limited. Policymaking systems, on the other hand, typically consist of multiple subsystems that allow for many problems to be considered simultaneously. The second assumption listed above is that time constrains the range and number

of issues that are under consideration at a given time. This means that policymakers must strike while the iron is hot in order to improve the likelihood of a problem being addressed. The third assumption is closely linked to the first: the parallel processing of systems means that the problems (concerns that people inside and outside policy systems have), policies (solutions), and politics (the climate of opinions) flow through the system independently, with lives of their own.

Political manipulation is the term used in the multiple streams framework to describe efforts to manage ambiguity. Political manipulation is the act of providing or creating meaning for policymakers in order to shape their preferences and decisions. The actors who seek to influence policymakers are termed *policy entrepreneurs*. According to Kingdon (1995), policymakers commonly make decisions when the three streams (problems, policies, and politics) are coupled, or joined together, by entrepreneurs at a critical moment known as a policy window. Such windows may be opened by events in the political stream, including crises or natural disasters, and tend to only be fleeting in duration. Effective policy entrepreneurs are ones who recognize the opening of a window and swiftly initiate action by successfully attaching problems to solutions and building political support for their ideas.

Figure 1. Diagram of the Multiple Streams Framework (adapted from Zahariadis, 2014)

Figure 1 provides a diagram of the multiple streams framework. There are five structural elements in the framework: problems, policies, politics, policy windows, and policy entrepreneurs. As shown in the diagram, the problem stream refers to conditions that decision makers and stakeholders want to be addressed. Policymakers learn about these conditions through focusing events (e.g., a terrorist attack), feedback, or indicators (e.g., statistical data). The politics stream consists of the various elements that affect political decision making (e.g., the balance of power in Congress and the national mood). The policy stream is described by Zahariadis (2014) as "a 'primeval soup' of ideas that compete to win acceptance in policy networks" (p. 33). Policy entrepreneurs attempt to couple these three streams during a policy window by bringing their policy ideas (solutions) to policymakers and linking them to problems and the existence of political support.

Methods

The data analyzed in this study were gathered as part of the research conducted for CAFÉCS's "hybrid ECS for credit recovery" project. CAFÉCS researchers interviewed the hybrid ECS developers and district-level administrators at regular intervals during the development and piloting phases of the course. Also analyzed for this paper were artifacts that were gathered pertaining to district and state policy (e.g., the CPS "acceptable use policy" document and state and district remote learning guidance documents). Salient information concerning the topics of entrepreneurship and policy change were extracted from the interview transcripts and documents in order to construct an explanatory narrative of events based on the multiple streams framework.

Data Sources

Six one-hour interview transcripts were included in this analysis. These interviews were with the two course developers (4 interviews) and a district administrator (2 interviews). In addition, the following artifacts were triangulated against the interview data:

- Chicago Public Schools "Staff Acceptable Use" policy document (August 2019)
- Illinois State Board of Education "Education-Related Guidance for Illinois Schools and School Districts Regarding Coronavirus/COVID-19" document (March 2020)
- Chicago Public Schools "COVID-19: School Closure Administrator Guidance for Continued Learning" document (March 2020)
- Chicago Public Schools "Principal Communication" document (March 2020)
- CAFÉCS "Request to Pilot the Use of Synchronous Collaboration Tools for Credit Recovery" document (April 2020)
- Chicago Public Schools "Selecting a Communication Tool" document (April 2020)
- CAFÉCS meeting minutes
- Contemporaneous notes taken by RPP members across time

Findings

The first round of piloting for hybrid ECS helped to expose the limitations of asynchronous remote instruction for students who had already failed the course. During the initial implementation of hybrid ECS, students working remotely struggled to complete some of the

work without the teacher's live guidance and immediate feedback. Moreover, some students failed to engage with the work altogether, in spite of the teacher's efforts to communicate with them via email. Reflecting on the first pilot in December of 2019, one of the course developers provided the following description of the problems with asynchronous remote credit recovery:

We are dealing with an audience that already has attendance problems and has already failed. So we are already set up with more challenges than not. And, in general, we know that those kids need more monitoring and attention from teachers. We also, in the spirit of ECS—which Chicago has adopted for a reason—are focused on collaboration and high-touch instructional involvement, and those things are not possible given the technological limitations that have been put in front of us. (Course Developer)

The technological limitations mentioned by this developer stemmed from CPS's acceptable use policy, which, at the time of the initial pilot, prohibited the use of synchronous online collaboration tools (e.g., Google Meet or Zoom) by students, with the exception of teacher-led, one-way instructional videos. This restriction created a significant barrier to one of the fundamental tenets of the equity dimension of ECS, namely, creating opportunities for teachers to build upon the unique strengths that each student brings to the ECS classroom.

It was apparent to the course developers and members of CAFÉCS that remote credit recovery delivered asynchronously was not a tenable solution. Thus members of CAFÉCS met and decided to attempt to shift CPS policy on the use of synchronous online collaboration tools. A CAFÉCS meeting was held in which a plan was made to co-develop a policy brief that could be taken to district-level administrators and used to shape the preferences of these decision makers. The resultant document included four main sections: the requested policy change, the rationale for change, a suggested plan for ensuring the appropriate use of electronic communication, and information about CAFÉCS. By coupling the problem of asynchronous learning for remote credit recovery with the solution of a policy pivot that would allow for the

use of Google Meet, CAFÉCS members acted as policy entrepreneurs seeking to build support for their policy preference. The rationale for the policy change, as laid out in the document, was as follows:

Current district policy prohibits synchronous online communication between teachers and students via video conferencing or instant messaging. This policy has created a significant constraint for the hybrid ECS course developers. The ECS curriculum's strong focus on collaborative learning is difficult to recreate via asynchronous modes of communication (e.g., email). Furthermore, feedback provided by teachers indicates that asynchronous instruction makes it difficult to effectively monitor student engagement and identify students who are at risk of failure, due to issues with executive functioning, time management, and/or motivation. Another challenge created by the existing policy is that asynchronous instruction makes it difficult for teachers to meet the expectations laid out in the Charlotte Danielson [teacher evaluation] framework, which requires the ability to foster student-student discussion. (Excerpted from "A Request to Pilot the Use of Synchronous Collaboration Tools for Credit Recovery," April 2020)

Contemporaneous notes and meeting minutes from late 2019 and early 2020 show that informal conversations with district administrators had provided some indication that shifting the existing acceptable use policy could prove difficult. Perhaps the greatest roadblock at that time was district concerns about monitoring communication and ensuring student safety. The policy brief document intentionally sought to allay this concern by laying out a plan for controlling access (e.g., limiting access to scheduled class times) and a plan for recording all synchronous sessions, in order to monitor teacher-student and student-student interactions.

The policy brief that CAFÉCS developed coupled the solution of sanctioning the use of synchronous online collaboration tools with the problem of ineffective remote credit recovery by emphasizing issues of equity. Prior research by CAFÉCS had discovered that the students most likely to fail ECS were Latinx and African American students who identified as boys (McGee et al., 2018). Thus if credit recovery course options in CPS failed to engage students and foster

success, it would contribute to the lack of representation by historically under-represented students in the field of computing. This equity framing of the problem and proposed solution was to be the main argument used to build support for the policy change.

In March 2020, Governor Pritzker ordered the closure of all public and private K-12 schools in Illinois (initially from March 17 to March 30) due to the public health emergency created by the COVID-19 pandemic. Furthermore, Chicago Mayor Lightfoot announced that CPS would close schools until April 20 (CPS schools ultimately remained closed to in-person instruction until early 2021). This occurred at the same time that CAFÉCS members were planning to meet with district officials to discuss their policy brief. A major shift that occurred as a result of the pandemic closures was the district's transition to remote learning at scale. Describing the pandemic as “an unprecedented time in our country” that called for a “unique response” (“Principal Communication,” March 2020, p. 1), CPS directed school leaders to review the district guidance for continued learning. This guidance included the following statement: “ISBE is encouraging all school districts to provide learning opportunities to all students, *through whatever means possible* [emphasis added]” (“COVID-19: School Closure Administrator Guidance for Continued Learning,” March 2020, p. 2). Consequent efforts in Chicago to provide continued learning opportunities resulted in the sudden opening up of synchronous online instruction in schools across the district via Google Meet.

The second pilot of hybrid ECS occurred during the CPS summer session of credit recovery in 2020. Given the emergency-related shift in policy, the course was now able to be taught synchronously online. This pilot was significantly more successful than the first pilot, with 97% of the 103 enrolled students earning a passing grade. And feedback gathered from

teachers during interviews on the implementation of the course further added to the evidence that struggling students benefited from real-time feedback and support.

Members of CAFÉCS are currently engaged in advocacy work to ensure that the use of synchronous online communication tools continues to be permitted following the end of the COVID-19 pandemic. A new version of the policy brief is being developed and preliminary conversations with district leaders have already begun. Applying the multiple streams framework to these events, COVID-19 created a policy window that the CAFÉCS computer science policy entrepreneurs have worked to capitalize on. The district-wide, successful use of Google Meet during the 2019-20 and 2020-21 school years has provided CAFÉCS with evidence to back up their prepared arguments that synchronous online instruction is more effective than asynchronous instruction for credit recovery and that the use of tools like Google Meet can be managed in a way that is safe for students (see Figure 2 for an illustration of the multiple streams model in the Chicago case).

Significance

The case presented in this paper provides an example of how events in the political stream serve to create opportunities for policy change. COVID-19 drastically altered modes of teaching and learning in Chicago and generated an opportunity for longer-term policy change. Prior to the pandemic, members of CAFÉCS were faced with seeking to persuade district administrators of the potential benefits of synchronous remote instruction. Policy entrepreneurs from CAFÉCS strategically sought to shape the preferences of decision makers by outlining the challenges of asynchronous learning and highlighting the equity issues associated with students failing ECS. (The fact that passing an introductory computer science course is a graduation requirement in CPS also added to the sense of urgency regarding the need for better and more equitable credit

recovery options.) It was pure coincidence that the policy shifted at the same time that CAFÉCS was seeking to achieve policy change. Synchronous online remote instruction became the norm in CPS as schools closed their doors to students in March 2020. The policy entrepreneurs of CAFÉCS quickly recognized the opportunity that this moment represented. Essentially, the pandemic created a policy window for advocating the continued use of online collaboration tools.

It is still too early to know whether CAFÉCS's efforts to maintain the current use of synchronous instruction for hybrid ECS will be successful, but the case presented here provides an illustration of how the multiple streams framework may be used to theorize about supporting policy change in a school district.

Figure 2. Diagram of the Chicago Case

Figure 2 provides an illustration of how the multiple streams framework was applied to the Chicago case. As has been outlined, the problem stream consisted of concerns regarding the implications of the computer science graduation requirement (students who failed ECS needed effective and equitable options to recover credit in order to graduate), inequities in course completion (African American and Latinx students who identified as boys failed ECS in CPS at a slightly higher rate than their peers), and the limitations of asynchronous instruction for remote credit recovery courses. The politics stream consisted of the COVID-19 pandemic and the shifts in teaching and learning that occurred as a result (e.g., the relaxing of the acceptable use policy). Recognizing the policy window that had opened, the policy entrepreneurs of CAFÉCS and the hybrid ECS developers moved to permanently shift the acceptable use policy by bringing evidence of the benefits and safety of synchronous collaboration tools to district administrators. It is still too early to know whether this entrepreneurship will succeed.

A further area of significance for this line of research is the application of the multiple streams framework within the context of an RPP. RPPs like CAFÉCS engage in ongoing problem-solving cycles in order to identify conditions that need to be addressed and queue up potential solutions to be tested. This type of entrepreneurship has helped CAFÉCS to recognize the opening of policy windows that allow for opportunities to advance its equity objectives for computer science in CPS. Future research should look for further examples of entrepreneurship within the context of RPPs and apply the multiple streams framework to explain how policy change may be achieved.

The COVID-19 pandemic created circumstances that CPS had to quickly respond to. School leaders, as a result, were asked to provide opportunities for students through whatever means possible. Thus the initial changes in the interpretation of the acceptable use policy were

not the product of efforts to influence policymakers by policy entrepreneurs; rather, the opening up of synchronous online instruction began as an emergency measure. Naomi Klein (2007) used the term disaster capitalism to describe how the crisis of Hurricane Katrina in 2005 created an opportunity for reformers to begin privatizing and profiting from public schools in New Orleans. The case presented in this paper, contrastingly, provides an example of how a crisis created an opportunity to advocate for policy focused on addressing equity concerns. Future research should explore other ways in which the COVID-19 pandemic helped generate opportunities for positive, equity-focused change in educational policy.

Acknowledgement

The authors were supported in part by National Science Foundation grants CNS-1842085 and CNS-1738572 to The Learning Partnership and CNS-1738776 to DePaul University. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of NSF.

Suggested Citation

Johnson, M., Wachen, J., & McGee, S. (2021). *Policy window in a pandemic: How a computer science RPP fostered equity in credit recovery*. A paper presented at the 2021 American Educational Research Association Annual Meeting. <https://doi.org/10.51420/conf.2021.1>

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