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**BPC Data Approach**

**ECEP**

**2018**

**Overview:** This document was created in partnership between the ECEP Annual Meeting Steering Committee and the Evaluator Working Group to help states prepare for the January 2018 meeting. **State teams are asked to complete the two tables (starting on page 3) by January 1, 2018**. These two tables ask you to reflect on your state’s strategy for broadening participation in computing and ask you to consider the ease of collecting a set of specific data in support of your state’s BPC goals, and the value of this data. These tables do not ask for you to collect the data. These tables will be used to guide a process that includes shared work at the annual meeting. Please return your completed form to Rebecca Zarch (at rzarch@sagefoxgroup.com) and Sarah Dunton at sdunton@cs.umass.edu. Any questions can be directed to Rebecca Zarch.

**Purpose:** The ECEP community has identified the 2018 Annual meeting topic to be: **How to set measurable goals to broaden participation in computing/measurement of broadening participation**. This topic emerged from the planning committee, on which 8 states are represented. This topic has gained more urgency over the last year as identified on the ECEP State Survey, and out of the BPC-A meeting at the CISE convening in March 2017 when EDC/Westat presented the results of the BPC-A evaluation and the limitations of their data. Planning for and tracking broadening participation is also becoming an area of increased interest across NSF as they work to promote [Accountability for Broadening Participation in STEM](https://drive.google.com/file/d/0B8L0cbqM_jrOVUhUbG5INmxkLXM/view).

Concurrently, the Evaluator Working Group (EWG), funded as a supplement to ECEP to “count” the number of teachers, schools, and students affected by the CS10K program, is seeking to define data requests at the state level to better understand participation in CS, particularly for underrepresented students. The effort will provide guidance to others looking to document BPC in their states and will hopefully result in a sustainable way to measure the progress of CS education in a given state.

The ECEP community and EWG are natural partners for this work. Currently the EWG work is funded through a subcontract through ECEP. Many of the ECEP states have developed strategic plans for organizing and advancing CS education in their states, taking into account the unique context of geography, educational standards, teacher certification, pathways and other factors that influence CS education. Most teams include partners from the Department of Education. [These states are also poised to take advantage of the Department of Education’s 200 million dollar investment in CS education](https://www.whitehouse.gov/the-press-office/2017/09/25/memorandum-secretary-education), which will require being able to baseline and track the impact of the investment. As ECEP plans its next iteration (affectionately referred to as ECEP 2.0) the focus will shift to a more concerted effort on state level data in support of broadening participation.

Collecting statewide data is challenging, as many states are learning. In the 2017 state survey, only a few states report they are tracking student participation. However when pressed, none have complete data in hand. States are sometimes using informal channels to make data requests, are gathering data in a piecemeal manner, or are finding that the systems available are highly controlled and inaccessible. One of the fundamental issues for many states is to define what courses “count” as meaningful CS experiences.

The EWG can help assist the ECEP alliance in creating an appropriate data request and potential analysis as a tool for ECEP states seeking to reflect on and track BPC efforts. This assistance can ensure the data plan captures the core of the BPC efforts, provides evidence that may position the states as BPC leaders and leaders to evaluate the effectiveness of BPC on K-12 computing pathways.

The rest of this document proposes an approach for supporting BPC data collection as a part of the ECEP focus for 2018, while capturing lessons learned for other states.

**Approach:** The 17 ECEP states are meeting in January 2018 to discuss how to track and demonstrate broadening participation in computing in their states. The following timeline/process is proposed for aligning the goals of ECEP and EWG and jointly developing a process for measuring BPC:

1. November-December ‘17: ECEP teams complete both the State BPC and State Data Ease & Value templates.
	1. Purpose of templates:
		1. States prepare for meeting by thinking through a process for defining and measuring BPC
		2. Results of their Ease/Value self-assessment can be used to break teams into working groups at the meeting and identify priorities
		3. The template serves as a foundation upon which to iterate items and document the Ease/Value explanations during the annual meeting and beyond.
	2. Some states may try to complete all or parts of the data request:
		1. They may have data already
		2. They may be able to collect new data
		3. They may [just have conversations with representatives](https://docs.google.com/document/d/1OojT8DK5OQl9_8vHdqt2k497tyPS0O1vjhrNQnOxLaI/edit) to learn what is feasible
2. January ‘18: ECEP teams gather for ECEP Summit:
	1. Agenda guided by the results of the templates
	2. SageFox capture lessons being learned
3. February-May, 2018: States try to capture data *(Anticipate that most states will not be able to completely populate the tables*.)
4. May-June 2018: Interviews with States:
	1. What could be populated and how?
	2. What barriers were encountered?
	3. Collect and understand any available data
5. June-August: Reporting on lessons learned about data collection to guide others

**STATE BPC EASE AND VALUE TEMPLATE:**

This template is designed to capture the approach states are using to define their BPC goals and capture relevant data. It is assumed that the definition of BPC and subsequent strategies will vary between states. Measurements will need to be designed to map the state-specific BPC efforts. This template will prepare state teams for the annual meeting where a deeper dive into defining goals and subsequent measures will be held.

The column “Source/Process/Notes” is to provide some additional context for what might need to be considered when trying to answer the question.

**Ease:**

3 = Defining this information is easy for our state team

2 = Defining this information is somewhat difficult/complex for our state team

1 = Defining this information is very difficult/complex for our state team

0 = I don’t know

*\*In some cases, defining information may mean coming to consensus among key stakeholders*

**Value:**

3 = This information is highly valuable to our state team

2 = This information is somewhat valuable to our state team

1 = This information is not valuable to our state team

 0 = I don't know

**STATE BPC EASE AND VALUE TEMPLATE:**

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| --- | --- | --- | --- | --- |
| **Topic** | **Question** | **Source/Process/Notes** | **Ease** | **Value** |
| **Defining our BPC work** | What is high quality CS? | Provide guidance and resourcesHow do we operationalize this (ECEP Alliance can define this)?What tracking systems exist at the state level already? Set criteria. Examples: TX: teacher certification; MD: Has a matrix of 6 types of CS | 3 | 3 |
| What do we mean by CS for All? | Identify what BPC/CSforAll means in your state (Models identified through SageFox state surveys):1. CS for every student
2. Targeting specific populations/regions
3. Designing curricula/pedagogy for equity, inclusion
4. Targeted initiatives
 | 3 | 3 |
| What do we mean by BPC? | BPC:1. More students in CS
2. More students of a certain demographic/location in CS
3. Students performing equally in CS
4. Students participating in targeted initiatives/performing equally
 | 3 | 3 |
| How does our state define CS? | What courses “count” as CS? * Are there standards/learning objectives tied to courses?
* Who decides?
 | 2 | 3 |
| **Notes** | We have partnered with MLDS for this baseline data in 2017. |
| **Topic** | **Question** | **Source/Process/Notes** | **Ease** | **Value** |
| **Goal setting**  | How do we measure / What gets at BPC?  | What do we want to accomplish in state level BPC work?* Demographic parity in participation/pass rates?
* Increases of a certain % for select groups?
* More courses that meet a set of principles around equity?
 | 3 | 3 |
| Defining success in BPC | What change do you want to see?* Enrollment?
* Pass rates?
* # of schools?
 | 3 | 3 |
| Setting goals and objectives in various aspects of BPC work  | Who has influence and ownership – how do we bring together multiple stakeholders (teachers, admin state leaders all have distinct goals, how do we channel them to one group of strategic goals?How do we set measureable goals? | 3 | 3 |

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| **Notes:** | We have the MD Computing Education Steering Committee which consists of stakeholders and meets to provide insight and guidance to our state level team. |

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| **Topic** | **Question** | **Source/Process/Notes** | **Ease** | **Value** |
| **Measurement** | What is the baseline data your state should focus on to start the process? | Participation data (including demograp3hics in support of BPC):* Schools
* Students
* Teachers prepared (capacity indicator)

*See State Data template below* | 2 | 3 |
| How are we measuring BPC?  | How is BPC defined in the state? What data will indicate progress against BPC goals? | 3 | 3 |
| How do we track inclusion/ retention/ diversity | Participation data* Number of and demographics of those participating in CS course(s)
* Number of and demographics of those passing course(s)
* Number of and demographics of those taking multiple CS courses
 | 2 | 3 |
| **Notes:** | Teacher data is more challenging. We have the level of teacher certification, but we do not yet have a better system of tracking specific course PD.  |

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| **Topic** | **Question** | **Source/Process/Notes** | **Ease** | **Value** |
| **CS Pathways** | Looking at model pathways. How to we measure achievement in pathways? how do we measure BPC in pathways? | Example: More schools offering CS; More schools offering more CS; Students participating in CS take subsequent courses; The students taking subsequent courses match the demographics of the overall student population. | 3 | 3 |
| Defining pathways (HS to 4yr, curricular, aspirational) |  | 3 | 3 |
| Beyond AP - what are other on-roads for CS? Informal Ed? |  | 3 | 3 |
| **Notes** | Pathway is the completer pathway (4 course sequence) for H.S. graduation |
| **Quality & Assessment** | How do we know if the CS is of high quality and rigor? | * Which courses “count” as high quality?
* What student outcomes can be assessed for quality?
 | 2 | 3 |
| **Notes:** | In MD, LEAs have local control of curricula, and we do not have an assessment for rigor of local LEA CS courses. |

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**STATE DATA COLLECTION TEMPLATE**

This template is designed to assess the feasibility of using state data systems (typically housed in the state department of education) to answer questions about CS offerings, participation and performance. Ultimately, the items may serve as the foundation for a formal data request. The basic request includes four questions, each with sub questions. These sub questions, especially for #1, 3 and 4 (following table) will allow for the capture of BPC as defined by the state. The four driving questions are:

1. What is being taught?
2. Who is teaching CS?
3. Who are (and are not) the students completing a CS course?
4. How well do students perform in CS courses?

Each of these questions may be answered at the:

* Individual level (which may be an individual course, an individual teacher, or an individual student)
* School level, in which data are aggregated across the school
* District level, in which data are aggregated across a district
* State level, in which data are available at the state level.

The template asks for an Ease and Value score for each potential level of data collection. There is also a place to put notes under each question.

**Scale:**

**Ease:**

3 = gathering this information is easy for our state team

 EX: State has an identified leader who has consistent access to data sources

2 = gathering this information is somewhat difficult/complex for our state team

 Data is collected based on relationships and not formal pathways

1 = gathering this information is very difficult/complex for our state team

 We know what we need to collect but do not have access

0 = I don't know

**Value:**

3 = this information is highly valuable to our state team

2 = this information is somewhat valuable to our state team

1 = this information is not valuable to our state team

0 = I don't know

**State Data Collection Template**

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| **Core questions** | **Sub questions** | **Level** |
| **Individual** | **School** | **District** | **State** |
|  What is being taught (All CS; breakout by CSP, ECS)? | Which courses “count” as CS for your state | 3/3 | 3/3 | 3/3 | 3/3 |
| How many sections of each course? | 2/3 | 2/3 | 2/3 | 2/3 |
| What are the characteristics of the course?1. Grade bands
2. Are any of these blended courses?
3. Is the course part of a pathway?
4. Does the course count as dual enrollment?
 | 2/3 | 2/3 | 2/3 | 2/3 |
| Notes: | Cells are suppressed at less than 10, but percentages per population can be reported. |

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| **Core questions** | **Sub questions** | **Level** |
| **Individual** | **School** | **District** | **State** |
| Who is teaching C (All CS; breakout by CSP, ECS)S? | How many teachers teach a CS course? | 2/3 | 2/3 | 2/3 | 2/3 |
| How many teachers teach each CS course?  | 2/3 | 2/3 | 2/3 | 2/3 |
| How many teachers teach multiple courses?1. 1, 2, 3, 4+
 | 2/3 | 2/3 | 2/3 | 2/3 |
| Do you identify teachers who teach CS courses?1. Gender, ethnic and racial identities; disability status;
2. Training history
3. Certification/credentialing
4. Primary teaching field
5. # years teaching K12
6. # of years teaching CS
 | 2/3 | 2/3 | 2/3 | 2/3 |
| Notes: | Teacher level of state certification is available. |

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| **Core questions** | **Sub questions** | **Level** |
| **Individual** | **School** | **District** | **State** |
| Who are (and are not) the students taking and completing a CS course(All CS; breakout by CSP, ECS)? | What are the demographics of the overall student population?1. Gender, ethnicity, race, language, SES, free/reduced lunch, disability
 | 3/3 | 3/3 | 3/3 | 3/3 |
| Who are the students taking Computer Science (by course)?1. How many students
2. Demographics: Gender, ethnicity, race, language, SES, free/reduced lunch, disability
 | 3/3 | 3/3 | 3/3 | 3/3 |
| Taking at least 1 computer course in academic year?* How many students?
* What are the demographics of these students?
* What is the pass rate/demographics of these students?
 | 3/3 | 3/3 | 3/3 | 3/3 |
| Notes: | Baseline data 2017 |

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| **Core questions** | **Sub questions** | **Level** |
| **Individual** | **School** | **District** | **State** |
| How well do student perform in CS courses (All CS; breakout by CSP, ECS)? | Outcomes1. Passing rates
2. Grades
3. AP scores
4. Prior/Subsequent course taking
 | 3/3 | 3/3 | 3/3 | 3/3 |
| For all graduating 12th graders, what % have had 0/1/2/3+ computing courses?1. What are the demographics of students who have had 0/1/2/3+ computing courses?
 | 3/3 | 3/3 | 3/3 | 3/3 |
| How many students pass CSP and CS-A courses?1. What are the demographics of students passing each AP exam?
 | 3/3 | 3/3 | 3/3 | 3/3 |
| Notes: | We have not obtained performance data yet, but it is available. The same suppression issues will apply to this data. |

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Note on making a (future) data request:

* When preparing a data request, states should consider the parameters of their request, for example are they limiting to high school, or all grades? Will courses that integrate CS or CT into non-CS subjects be included? Will historical data be captured to identify any trends over the last # years?
* The EWG is interested in understanding the impact of PD programs, particularly through NSF’s CS10K, STEM+C, MSP and CS for All: RPP programs in broadening participation in the Exploring Computer Science (ECS) and AP Computer Science Principles (CSP) courses. Thus, when making a request we ask that the data be further broken out for these courses.