WhyCS

An Interactive Activity about
Values in Computer Science Education

UCIrvine CSforALL

What's the point?

WhyCS is an activity meant to foster reflection, debate and discussion about the purposes of computer science education.

By clarifying our underlying values, we can make better decisions about what kind of CS learning experiences we want to support.

UCIrvine CSforALL

Who is this for?

WhyCS can be used by:

- *Teachers*
- *District leaders*
- *School teams*
- *Informal educators*
- *Designers of CS curriculum and tools*
- *Researchers and evaluators*

...and really any group that's looking to think through its values around why it could be important to teach CS to young people.

UCIrvine CSforALL

How does it work?

The activity has a couple of parts, and you can mix and match them depending on what works for you. This deck has slides that guide the following activities:

- ***Education for What?*** *(~5 minutes) - A general brainstorm on the purposes of education.*
- ***Intro to the CS Visions framework*** *(~10 minutes) - a guiding set of slides that introduce the thinking behind the framework and framework itself.*

UCIrvine CSforALL

How does it work? (cont.)

- ***WhyCS? Heatmapping your group's values around CSed*** *(~30 minutes) - the core activity of reflecting, voting and discussing different rationales and core values around CSed.*
- ***Linking Values to Design & Implementation Implications*** *(~20 minutes) - participants try to imagine the implications of their values when it comes to issues of design or implementation of CS education.*

UCIrvine CSforALL

What do we need?

- *Sticky notes*
- *WhyCS statement cards (cut up - download cards here: whycs.csforall.org/unplugged)*
- *Sticky 'dots' (for voting)*
- *This slide deck*
- *A group of people interested in discussing values behind CS education*
- *About an hour to an hour and a half*

UCIrvine CSforALL

Let’s get going!

Visions of Computer Science Education

“Educational plans and projects must have a philosophy... otherwise they are at the mercy of every intellectual breeze that happens to blow."

- John Dewey, 1938

UCIrvine CSforALL

Visions of Computer Science Education

Unpacking Arguments for and Projected Impacts of CS for All

Paper by:
Sara Vogel, CUNY Graduate Center
Rafi Santo, CSforAll
Dixie Ching, Google

UCIrvine CSforALL

Why Bother?

Our values (*should*)
shape the pedagogy we practice.

Stepping Back: Education for what?

Each person should write **3 answers** on **3 separate stickies** to the prompt...

What's one purpose of education? (2 minutes)

What are the most important needs of your students and community? (2 minutes)

Stepping Back: Education for what?

Where did you see similarities and differences amongst your group?

Where were there differences between the first and second prompts?

UCIrvine CSforALL

“CSed Vision”

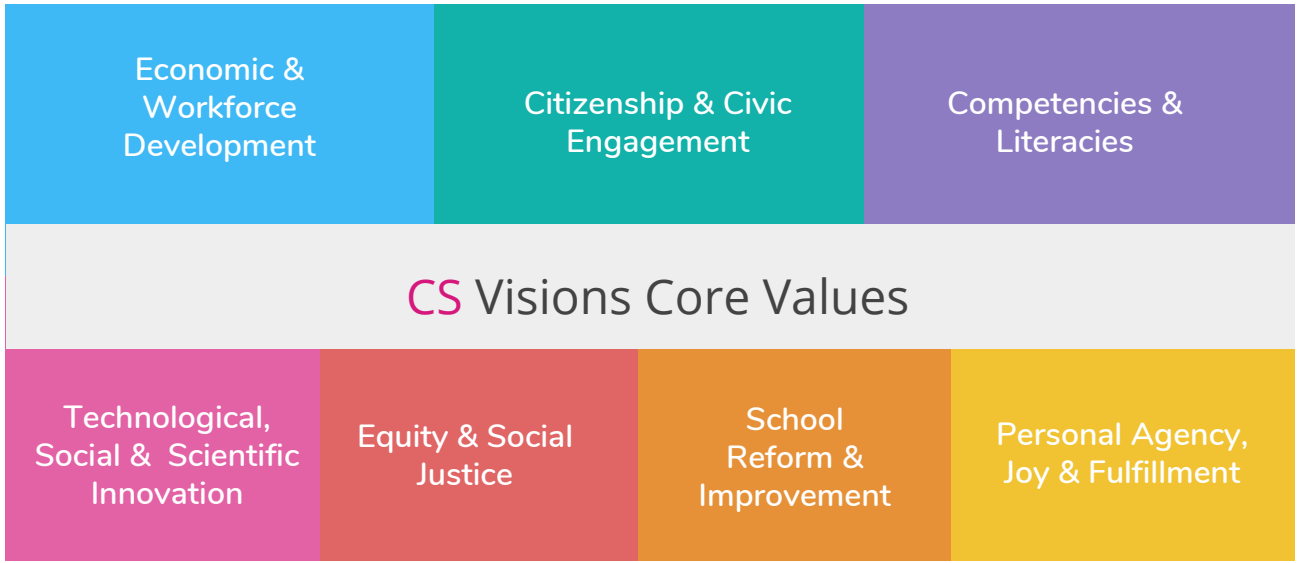
=

Argument for CSed,
associated impact and underlying values
+

Pedagogical Approach to CSed
(curricular & instructional principles, learning goals…)

UCIrvine CSforALL

Let’s look at some examples of rationales…

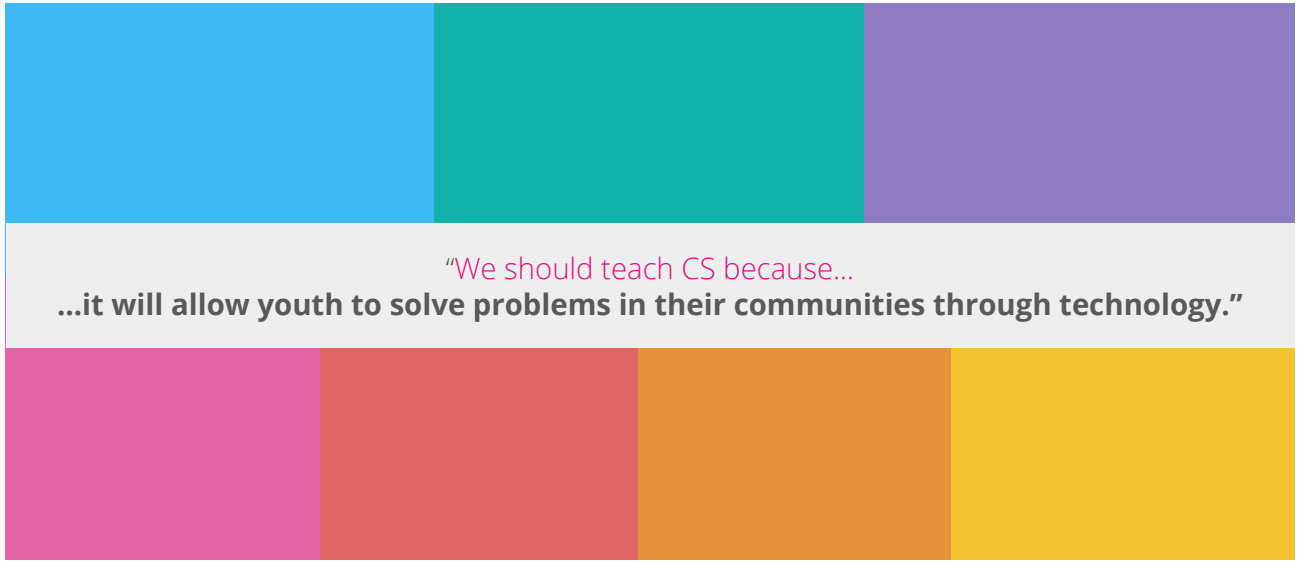


UCIrvine CSforALL

UCIrvine CSforALL

UCIrvine CSforALL

UCIrvine CSforALL

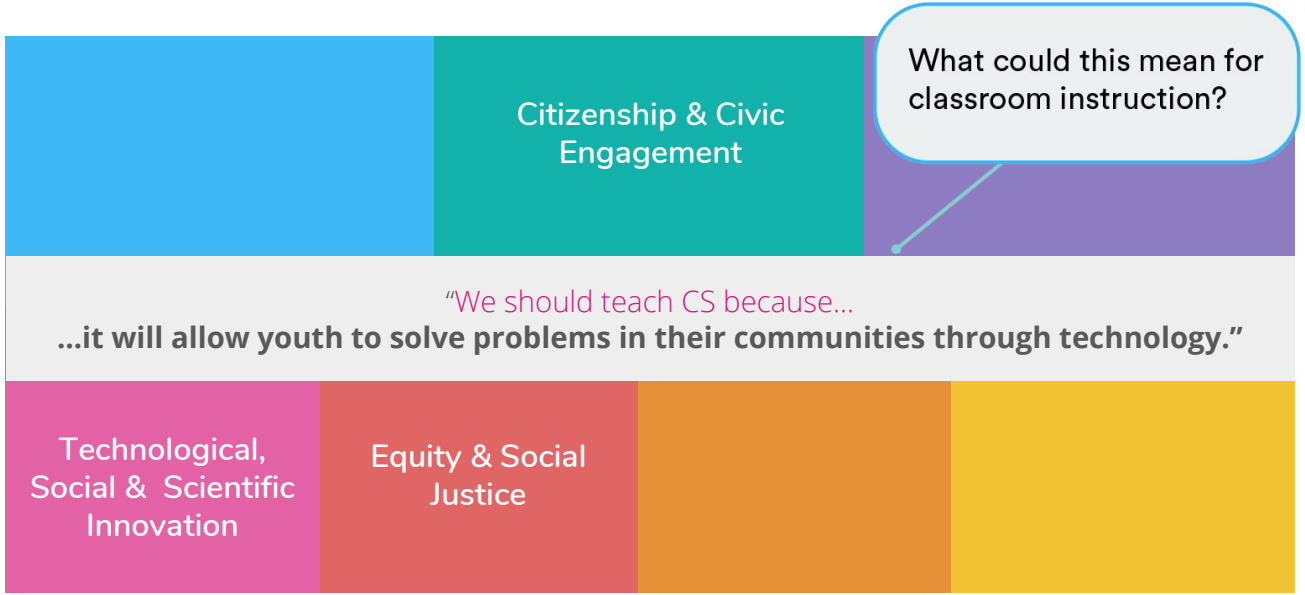


UCIrvine CSforALL

UCIrvine CSforALL

UCIrvine CSforALL

UCIrvine CSforALL



UCIrvine CSforALL

WhyCS? Heatmapping your group's values around CSed

Step 1: Break up into groups of 2-3 within your group, with each group getting one "deck" of WhyCS statement cards.

Step 2: Review, and nominate 5 cards to go into the middle of the table. (10 minutes)

UCIrvine CSforALL

WhyCS? Heatmapping your group's values around CSed

Step 3: Bonus hand! Each team can add up to 3 additional reasons using the blank cards. (5 minutes)

UCIrvine CSforALL

WhyCS? Heatmapping your group's values around CSed

Step 4: Full Group Discussion (10 minutes)

- Why did you select the ones you did?
- Are there rationales that you hadn't considered for CSed before?
- Are there more or less of certain kinds of statements in the pile? Why do you think that is?
- Are the statements in the pile related to your initial purposes for education or needs for your community?
- What's missing? Is there something critical you think should be added to guide your work around computer science education?

UCIrvine CSforALL

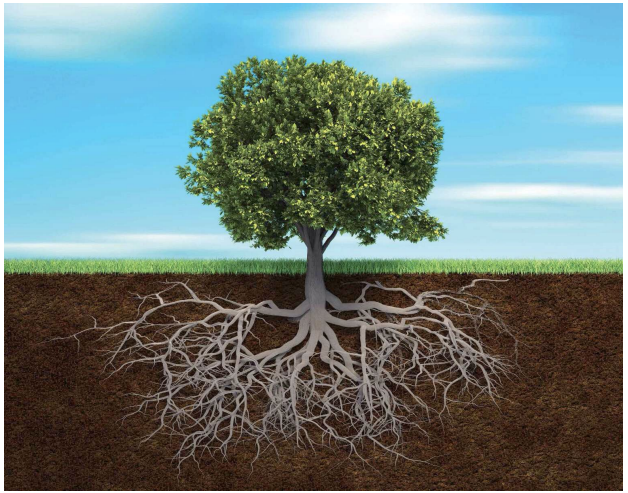
WhyCS? Heatmapping your group's values around CSed

Step 5: Voting on your groups values (5 minutes)

- Using voting dots, vote for 3 cards that are most representative of why you care about CS education. You can't vote for a card twice.
- After everyone in the group has voted, tape any cards that have a vote onto a piece of chart paper.
- Tally the number of cards you have associated with each of the 7 impact areas.
- Take a couple of minutes to discuss and review your "WhyCS? Heat Map" and note any distinctive features. How do they align with your vision of education?

UCIrvine CSforALL

Linking Values to Design & Implementation Decisions



UCIrvine CSforALL

Linking Values to Design & Implementation

Rationale/Value *We should teach CS because…*	**Implementation Implication** *As a result, our CS education efforts might look different in these ways…*
	You can address different levels of implications such as: What learning goals look like What classroom instruction looks like What extracurriculars look like What credit policies and course offerings look like Etc…

UCIrvine CSforALL

Linking Values to Design & Implementation

Example rationale *We should teach CS because…*	**Example design/implementation implication** *As a result, our CSforAll implementation might look different in these ways…*
…it can deepen learning in other subject areas.	At the level of **learning goals…** …We should look at existing goals/standards from different subject areas and determine where we can integrate CS into them. At the level of **extracurriculars…** …We should offer clubs, programming, and access (on & off campus) that allow students to explore how CS fits in with many different disciplines & content areas.

UCIrvine CSforALL

Linking Values to Design & Implementation

Example Rationale *We should teach CS because…*	**Example Design/Implementation Implication** *As a result, our CS education efforts might look different in these ways…*
…there are major disparities in women in STEM fields and universal CSed is part of addressing that.	At the level of **course requirements and credits**…. …we might consider not making CS courses optional. At the level of **instruction**… …we should find or develop curricula relevant to identities of women and girls. At the level of **extracurriculars**… …we should explore models of women/girls focused CS extracurriculars.

UCIrvine CSforALL

Linking Values to Design & Implementation

Rationale/Value *We should teach CS because…*	**Implementation Implication** *As a result, our CS education efforts might look different in these ways…*
…it helps students to develop life long skills of creativity, communication, collaboration, and persistence.	At the level of **classroom instruction…** …Inquiry Based Instructional Practice …Project-based learning …Collaborative learning practices …Design thinking …Small group Instruction …Classroom environments that allow for failure in a safe way …Encourage student driven problem solving

UCIrvine CSforALL

Linking Values to Design & Implementation

Example Rationale/Value *We should teach CS because…*	**Example Design/Implementation Implication** *As a result, our CS education efforts might look different in these ways…*
…value systems are embedded in our technologies, and youth need to be able to see that.	At the level of **learning goals**… …we should include learning outcomes around knowing how to ask questions about the purposes and values associated with existing technologies.

UCIrvine CSforALL

Linking Values to Design & Implementation

Rationale/Value *We should teach CS because…*	**Implementation Implication** *As a result, our CS education efforts might look different in these ways…*
Your statement here	At the level of **learning goals…** *..Your Implication here* At the level of **classroom instructions…** *..Your Implication here* At the level of **extracurriculars…** *..Your Implication here* At the level of **credits/course offerings…** *..Your Implication here*

UCIrvine CSforALL

Linking Values to Design & Implementation

Team work time (15 minutes)

Step 1: Form pairs of two within your team.

Step 2: Each pair should choose **one rationale** that you voted for during the WhyCS heatmapping activity, discuss possible design or implementation implications.

Linking Values to Design & Implementation

Share-back.

What were some examples of implications you came up with?

Were there rationales or values where it was challenging to figure out the implications?

Find out more about this project and play the online version at:
WhyCS.CSforAll.org

For more resources related to school and
district planning around CS education, visit:
CSforAll.org/SCRIPT

WhyCS? was produced by CSforAll and UC-Irvine as part of the larger CS Visions Research-Practice Partnership. Funding for the CS Visions project was provided through grant number 1738675 by the ***National Science Foundation****. Any opinions, findings, or conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.*