

Defining and Delivering Equity

How one RPP develops a definition and puts it into practice

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ABSTRACT

Computer science (CS) has the potential to positively impact the economic well-being of those who pursue it, and the lives of those who benefit from its innovations. Yet, large CS learning opportunity gaps exist for students from systemically excluded populations. Because of these disparities, the Computer Science for All (CS for All) movement has brought nationwide attention to inequity in CS education. Funding agencies and institutions are supporting the development of research-practice partnerships (RPPs) to address these disparities, recognizing that collaboration between researchers and educators yields accurate and relevant research results, while informing teaching practice. However, for initiatives to effectively make computing inclusive, partnership members need to begin with a shared and collaboratively generated definition of equity to which all are accountable. This paper takes a critical look at the development of a shared definition of equity and its application in a CS for All RPP composed of university researchers and administrators from local education agencies across a large west coast state. Details are shared about how the RPP came together across research and practice to define equity, as well as how that definition continued to evolve and inform the larger project's work with school administrators/educators. Suggestions about how to apply key lessons from this equity exercise are offered to inform similar justice-oriented projects.

CCS CONCEPTS

• Applied Computing • Education

KEYWORDS

Equity, Research-Practice Partnership, Computer Science Education

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1 Introduction

As the computer science (CS) education community confronts our history of inequitable teaching practices, structures, and policies that have resulted in Black, Latinx, Indigenous, low-income, and female students being left out of CS classes and career opportunities, the field has begun to translate research into practical applications in its initiatives. Yet there is neither a clear nor shared definition of “equity” within the field of CS education, and even less so across communities of CS education researchers and practitioners. This experience report helps to fill this gap by describing how our research-practice partnership (RPP) composed of district and county office administrators and university researchers - SCALE-CA - collaboratively developed a definition of “equity” that served as a touchstone for how we enact it in the development of resources for educators, administrators, and policymakers. The larger goals of our RPP are to scale teacher professional development, build the capacity of education leaders for local implementation, and contribute to the research base on expanding equity-minded CS teaching and learning opportunities across the state of California. The focus of this project is to build leadership capacity to ensure that equity is kept at the core of CS education expansion efforts, and our RPP has successfully created and piloted a CS Equity Guide with a corresponding Administrator Workshop (described in greater detail below). Our specific RPP was first composed of researchers five early-adopter district or county offices, otherwise known as local education agencies (LEAs). These early adopter LEAs are Compton Unified School District, Los Angeles Unified School District, Riverside Unified School District, Sacramento County Office, and San Francisco Unified School District. After the first year, the partnership expanded to seventeen LEAs that represented the varying demographics, geography, and sizes of the state's diverse school system. The additional twelve LEAs are Elk Grove Unified School District, Glenn County Office of Education, Kings County Office of Education, Los Angeles County Office of Education, Modesto City Schools, Riverside County Office of Education, San Bernardino County Superintendent of Schools, San Diego County Office of Education, San Joaquin County Office of Education,

Santa Barbara County Education Office, Stanislaus County Office of Education, Valley Center High School.

In this paper, details about RPPs (including our specific RPP) and the need to focus on equity are shared to provide context. This is followed by: 1) a description of the ideas informing our own RPP's effort to define equity so that it could guide our CS education activities, 2) the step-by-step process we used toward defining equity, 3) how that definition continues to evolve, 4) key lessons learned through this exercise, and 5) suggestions for how to apply these lessons to similar equity-focused projects

2 Background

Within the past decade, the CS for All movement has been turning to RPPs as a means for supporting the growth of new curricula, professional development, and CS implementation efforts while simultaneously ensuring the creation of new knowledge that can be immediately useful to both practitioner and researcher communities. RPPs are collaborative partnerships between practitioners and researchers that investigate the education community's problems of practice and their solutions [1]. Since 2017, more than 70 RPPs have been funded by the National Science Foundation alone, and many others through various funding agencies. All NSF-funded RPP projects, specifically, not only focus on CS education, but the goal of broadening participation in computing. The focus on broadening participation is meant to address the stark inequities that exist in computing education, as well as computing as a profession [2].

Our RPP came together because we share the belief that all students deserve equitable access to high-quality CS education. Yet while many important advancements have been made in recent years to create more culturally responsive curricula and improve teaching practice through equity-minded professional development, the CS for All movement still lacks adequate support for school leaders and administrators whose decisions have major implications for whether or not students even have computing classes in their schools. To fill this gap, our RPP developed two leadership-focused resources. The CS Equity Guide (<https://csfora.org/csequityguide/>) was intended to assist administrators looking for practical steps and resources for equitable CS implementation in their schools, districts, and counties. After starting with the experiences of administrators from two early-CS-adopter districts, researchers interviewed administrators from other districts and counties throughout the state and grouped the content into categories and produced a 46-page guide that was available via download or print. Chapters included Developing Pathways; Students and Recruitment; In the Classroom; Preparing and Supporting Teachers; Funding; Family, Community, and Industry; and Out-of-School Learning. After feedback from the first version was analyzed, a second 54-page iteration of the guide was released a year later.

Because administrators wanted further support in using the CS Equity Guide, the RPP also developed an Administrator Workshop to help them examine bias and make decisions that affect equity in their classrooms. Since its pilot in 2019, iterations of the workshop have been implemented every six months. This

Administrator Workshop has also been part of the Summer of CS, a multi-stakeholder California-focused PD experience for teams of teachers, administrators, and school counselors. Three iterations of the Summer of CS have now taken place in 2019, 2020, and 2021.

Yet what exactly does it mean to support administrators in implementing equity-minded CS through an Equity Guide and Administrator Workshop? What does "equity" mean within the context of these resources? And what does equity mean within the context of the RPP creating these resources?

We believe that in order for equity to be a focus of RPP efforts, it must also be a central tenet built into the RPP's research and learning processes; deliberate actions must be made to honor each partner's funds of knowledge, values, language, and experience. When equity is operationalized intentionally in an RPP, both practitioners and researchers feel that their input and interests are valued [3]. By challenging the structural hierarchy that oftentimes prioritizes the problems and the knowledge base of the researcher above that of the practitioner, RPPs can elevate the practitioner's needs and experience to produce more relevant research and outcomes [4]. RPPs should not only honor the expertise of practitioners, but allow for the critical examination of how power and culture can impact research and education implementations [2, 3].

Santo et al. [5] have documented how this equity-minded approach of an RPP's architecture can produce "participatory knowledge building", in which the joint development of artifacts produces much more than the artifact itself. By positioning the practitioner as collaborator, research teams produce shared language and a shared orientation toward knowledge building that elevates practitioner experience. Using equity as a foundation for their internal infrastructure facilitates RPP's focus on equitable environments and outcomes for students.

Building on these ideas, our CSforAll RPP sought to collectively make sense of "equity" as a foundation on which to build our equity-focused efforts. From the start, our RPP acknowledges that the word "equity" could have multiple meanings and that concerted effort must be made to ensure that the word was not being "deprived of its dimension of action" or simply "idle chatter...an empty word, one which cannot denounce the world, for denunciation is impossible without a commitment to transform, and there is no transformation without action" [6, p. 68]. This is because the term "equity" has been increasingly used in the field of education, but in a range of ways and contexts. In general, "equity" has signaled commitments, efforts, and research focused on challenging the inequalities experienced in educational contexts. However, exactly which aspects of inequality and oppression are actuated in the definition of equity reflect a large range of ideas, resulting in many disparate definitions for the term "equity." The concept of "equity" is exactly the "verbalism" and "idle chatter" that Freire refers to if it is not rooted in commitments to transformation through action. "Equity" cannot be fully understood and meaningful without praxis between reflections upon the concept in theory, and understandings of its practice in action.

Thus, our RPP engaged in a collaborative sense-making process in which researchers and practitioners could engage in praxis that would make the idea of equity come to life in our shared work. We wanted this term to embrace both reflection and action--theory and practice--that both researchers and practitioners brought to the table. And we sought to do this through dialogue, which Freire explains, “is the encounter in which the united reflection and action of the dialoguers are addressed to the world which is to be transformed and humanized, this dialogue cannot be reduced to the act of one person’s ‘depositing’ ideas in another, nor can it become a simple exchange of ideas to be ‘consumed’ by the discussants” [6, p. 69-70]. To ensure such authentic dialogue, we thought it necessary to engage in making sense of equity from our various roles, responsibilities, experiences, and perspectives, while simultaneously couching the effort in the project we were about to embark upon (namely, developing an equity guide and workshop for administrators, supporting professional development for teachers, etc.).

Of course, such work together came from a standpoint of valuing each other’s various positionalities and perspectives within the RPP and not holding academic knowledge or theory as more important than the ideas of administrators/educators. In *Teaching to Transgress*, hooks [7] cites Freire to describe the necessity of “intellectuals” to challenge such power hierarchies toward praxis in which all “help each other mutually, growing together in the common effort to understand the reality which they seek to transform” (p. 54). This is particularly important because researchers often take on the “privileged act of naming” ideas in the world, and have the power to “project an interpretation, a definition, a description of their work and actions, that may not be accurate, that may obscure what is really taking place” [7, p. 62]. Thus, in our RPP we believed it important to share this “act of naming” to ensure that the ways we understand and therefore position our efforts toward the concept of “equity” authentically reflects both researcher and practitioner problems of practice. Such can only be done through praxis.

3 Developing the Definition

The RPP began in 2018 with university researchers and administrators from five LEAs. When we first gathered to kick off the partnership, we spent two days defining the problems of practice we wanted to focus on in order to address equity in CS education. Nearing the end of the second day, the fourth author, an administrator from a large urban school district asked, “But how are we defining ‘equity’?” We realized that we had begun our work without addressing this foundational element. By working out how we would define “equity” as a group, we could acknowledge and honor the voices, perspectives, and cultures of all stakeholders on our team to enhance the capacity of our mission. We would also have the language and understanding necessary to describe the policies, practices, and behaviors to promote CS education with equity as the base.

The RPP agreed to meet monthly after the kickoff to address the challenges. But we felt we first had to develop a process to co-create a definition of equity among the RPP. The fourth author

had been through the process of collaboratively defining “equity” at his district, and led the process for SCALE.

First, both university researchers and school leaders were sent an email to individually generate perspectives on equity based on personal held beliefs, literature or research of interest, and LEA/institutional definitions:

“As we continue our work with SCALE-CA, we would like to gather each organization’s working definition of equity. We understand that some organizations do not currently have a definition of equity. For those of you in organizations without a district/county definition, please provide us with your personal definition. The form can be accessed [HERE](#) [link to Google form] and your response is needed by the end of business on Feb 11th. We are hoping to gather the unique definitions of equity from all stakeholders and have a conversation about developing a single, community-based definition of equity. This will hopefully help us to uncover what it means to provide equitable learning opportunities as a part of SCALE-CA.”

The Google form that was linked to the email included a field for their name, organization, and their or their organization’s definition. Partners were then randomly paired off and asked to meet on their own time to share and discuss their personal definitions. The pairs were made up of researchers with practitioners, or practitioners with practitioners, but never two researchers together. In these 2-person meetings, partners explored underlying values and divergent elements of equity beliefs, combining core values to produce a shared definition. Partners met together in brief or extended encounters up to an hour. Each pair then submitted their definition to a second Google Form that had a field for each partner’s name and their definition for equity.

The joint definitions submitted varied widely in both length and content. They ranged from 30 words long to 400 words long. Some definitions included specific deliverables to aim towards for equitable implementation of CS, e.g. outlining how the RPP intended to approach the inequity through the CS Equity Guide, the multi-stakeholder professional development, and informing policymakers. Other definitions were more general, using broad strokes to define equity (e.g. “Equity is accomplished when access is based on need, and every student is provided with what they individually require to learn and succeed to fulfill their academic and social advancement”). There were definitions that focused on an approach to equity (e.g. “Equity requires interrupting inequitable practices, examining biases, and creating inclusive environments for all, while discovering and cultivating the unique gifts, talents and interests that every person possesses”), while others were focused on the results of equity (e.g. “When success and achievement are not predictable by any demographic factor, equity is accomplished”). While all of the definitions were focused on students, and getting them what they need, one definition also included what equity meant to them in terms of partnership between the different collaborators on the project (e.g. “... we seek to maintain positive and equitable relationships between researcher and District/LEA partners”).

Following these two-person meetings, the larger team gathered for an hour and reviewed all of the definitions that each pair came up with by going over the summary of responses in the Google Form, discussing themes and differences. Partners who had very different definitions mentioned how much they enjoyed the process, as it not only helped them “gel” with one another, but it also allowed for interesting discussions about inequity and how their respective organizations were addressing it. One of the practitioner partners wanted to know how actionable vs how aspirational the defining of equity should be, especially for practitioner partners in districts like hers that are facing many challenges because their students have needs related to healthcare, housing, and food insecurity. She wondered if there were different stages of equity stated that you cannot define equity without having any access at all. After hearing this from her practitioner partner, a research partner recalled hearing from a speaker at a conference that “if you are in it for equity in computer science, you have to be in for equity in everything. You cannot just be an equity for computer science,” and she continued by saying that “equity is really meeting students where they are and offering those supports, but we also have to understand they are coming from very unequal systems at our door. And so how do we acknowledge that? And again, what is it that we can actually do? And what is our vision and hope for the future?” Other partners discussed the need to make a distinction between equity and equality, and to ensure that the process is cyclic, “constantly going back and saying, ‘What do students need now?’”

The discussion ended with a focus on next steps, with the idea of everyone returning to another discussion with their partner to reexamine their definition in light of the group discussion. The practitioner partner who brought up the point of the actionable vs the aspirational notion of equity had concerns about how long the process of defining equity within the group would take, when there was so much work to be done in her district. It was then decided that only if they had available time, the pairs could again work together on their definition, and then submit it to another Google Form.

The RPP reconvened three weeks later for an hour-long meeting, fifteen minutes of which was devoted to the equity definition. One of the researcher partners started the discussion off by saying she thought that an assumption being made was that anyone striving for equity believes that the system is unequal, and not everyone believes that it is, and that not everyone recognizes that inequality can be furthered through our own biases and stereotypes.

The next step was supposed to be that everyone voted on the partner-pair definition they thought best captured equity, after it being adjusted according to other definitions. But not everyone understood that they could access the other definitions and take from them, so the poll was conducted, but not taken very seriously. It was then decided that there should be a subcommittee to complete the definition, but then the process was redirected so that the various definitions would be amalgamated by the university team into one definition. This part of the process was led by the university research team in an effort to respect the time

of our busy practitioner partners who had already devoted sometimes up to 4 hours to the process. The definition combining all the various aspects of definitions across the group was then shared via a Google Doc. Partners then submitted their edits before the next meeting, which was one month after the second meeting. The research team adjusted the definition based on the edits submitted.

At the third meeting of the RPP, the first fifteen minutes were again devoted to the definition. The definition was read aloud, and then partners asked clarifying questions about certain sections of the definition. One of the research partners wanted a better understanding of what the term “social advancement” and what it referred to. Another research partner wanted to clarify whether the definition should generally be about equity, or specifically about equity in education, or equity in CS education. It was decided that the definition should stay the way it was, starting off defining equity in education and then focusing on equity in CS education. At the end of the discussion, partners agreed to return to it later. Edits to the definition were again made by the research team and shared with the entire RPP via Google Docs.

The definition is as follows:

Equity is accomplished when every student is provided with what they individually require to learn and succeed in fulfilling their personal, academic, and social advancement, and when success and achievement is not predicted by any demographic factor. This requires continually interrupting inequitable practices, examining biases, and creating inclusive environments for all, while discovering and cultivating the unique gifts, talents and interests that every student possesses.

Equitable practices are based in the belief that every child’s educational experience should be rigorous and relevant, and that everyone is capable of learning. These beliefs require providing a learning environment that is safe and respects every student.

While often used interchangeably, equality and equity are not the same. Equality suggests that all people should simply have access to the same resources, regardless of need. With equity, resources are distributed according to different students’ needs, while taking into account how certain students have been systematically denied access to educational resources, opportunities, and experiences based on race/ethnicity, gender, sexual orientation, socioeconomic class, and disability. An equity-based approach means acknowledging and challenging: 1) the institutional barriers impacting youth differently based on the way they look or where they come from, 2) countering practices rooted in stereotypes about who can or should excel, and 3) recognizing that people both present themselves and are treated differently in different contexts depending on how their various identities overlap and intersect. This requires an ongoing and cyclical approach to examining factors impacting youth’s experiences.

Computer science and computer science education have been documented as being highly segregated along race/ethnicity, gender, and socioeconomic lines due to a lack of access to high-quality computer science learning

opportunities for all students. However, an awareness of equity issues in the computer science education community presents an opportunity to structure learning opportunities and environments with equity considered throughout the progression from K-12, as frameworks, policies, and courses are being built. Not only is computer science an emerging field of study that leads to high-wage and high-demand careers that can address socio-economic inequality, but it can empower students to be critical users of technology and creators in all fields touched by technology, finding their voice in the digital environment that is becoming increasingly part of our communities.

An abbreviated definition with only 131 words was also created to be utilized when space was limited in publications and presentations.

4 Lessons Learned

The first lesson that our RPP learned is how important it is to build the partnership in an exercise that grounded everyone in a shared understanding of equity. If equitable CS education was the ultimate goal of the RPP, then partners needed to have a shared definition of what that means and looks like. Luckily one of the administrator partners jump-started the RPP in this direction, but if we had the opportunity to try this again, the practice of defining equity together would have been one of the first things we did at our 2-day kick off meeting, rather than following that initial time together. It would also have been beneficial to start the defining process with an activity that illustrated systemic inequity and personal bias before beginning the process of developing the definition.

The process of developing the definition immediately after the group was newly formed, as opposed to making time for it at the start of group-formation, was challenging. The practitioner partner that voiced concern over the time the process was taking never returned to another RPP meeting. She explained to a research partner that as a busy administrator, she was interested in what actions the group was going to take to improve outcomes in her district and other districts, and not in what she saw as an academic exercise of defining the term “equity.” Perhaps if we had made sure to prioritize this topic as a partnership-building activity at the start of forming the RPP, and used the activity as a way to then frame our 2-day kick off meeting, she may not have seen the exercise as so “academic.” Her reaction, however, serves as an important reminder of the need to ensure that these types of activities make clear connection to immediate use, practical purpose, and better align with practitioner time and needs.

Still, many in the RPP valued this process of defining equity together, and the need itself was identified by a practitioner partner (last author of this paper). The value that the majority of partners saw in this effort to define equity together suggests the importance of authentically drawing on practitioner experiences, values, and understandings to guide shared efforts in CS. One of the practitioner partners stated:

“I think we saw strengths from the different definitions. We ... worked to match the things that we liked the most. One of the conversations we had was based on some cultural and contextual differences of our districts, like [my] district is very progressive and goes out of the way to identify each kind of underrepresented or potentially marginalized group, and how factors of systemic oppression contribute to that, and it was very detailed. And so we tried to find that balance of how do we acknowledge systemic oppression and broader factors, while still keeping, I don't know ... something that's a little more tight. And we're pretty happy with how it ended up.”

Furthermore, we found the definition served as useful in our CS Equity Guide, as well as for informing our Administrator Workshop and multi-stakeholder professional development activities. The definition was used in the first section of the guide, explaining to the reader how we envisioned equity in relation to education and CS education, specifically, and how the answers to the questions in the guide reflected this understanding. The Administrator Workshop and Summer of CS were structured to address the definition's issues of individual bias as well as systemic inequity.

After the murder of George Floyd, some members of the RPP pointed out that while the expansion of the RPP aligned with our understanding of equity in that the represented districts were more diverse, there was a lack of administrators of color in the RPP. We focused on ensuring that the group was composed of administrators in LEAs that represented the varying demographics, geography, and sizes of California's diverse school system. However, using these variables as metrics including partner LEAs resulted in creating a group of administrators with demographics that were not representative of the state. We were intentional about including more administrators of color in our partnership, but our struggle in doing so points to a larger problem of a lack of administrators of color throughout the state. We also need to work to ensure administrators with disabilities and LGBTQIA2+ administrators are included in our RPPs to ensure equity in all its dimensions.

Finally, the consideration of what the collective considers equitable implementation should be reexamined regularly. So much has happened in the short life of this RPP -- the COVID pandemic, the Black Lives Matter protests, the January 6 insurrection, the rise of White supremacy, the upsurge of voter suppression, and legislative action to resist discussing our country's racial history in schools -- that few of us look at equity in the same way we did when RPP first began. For this reason, we have committed to looking at our definition more often, in order to consider where we may have previously overlooked what is contributing to inequity, whom it is affecting, and how it is affecting them.

5 Discussion

The events of the past couple of years have shifted our understanding of what equity is and how it is manifested in

different ways, whether in education, economics, climate or criminal justice. By using real examples to reflect on what equity is, we make it less abstract and can consider tangible solutions for how to deal with an ever-changing world. Examining actual instances of inequity brings into relief the realization that you cannot have equity in one discipline or one school without equity in society as a whole. We cannot be thinking about equity in CS alone, but instead we must consider how CS is situated within the larger context of an inequitable society.

In order to move definitions of equity beyond just academic exercises, it is important for us to revisit our definitions regularly and evaluate whether they correlate with the reality our students and teachers contend with, as well as whether we are doing what is necessary to eliminate systemic inequity. As Martin stated, conceptualizing equity as a process “highlights the fact that the necessary hard work will be ongoing and even when gains are made, a high degree of vigilance will be necessary to ensure that needs of marginalized students are attended to and that our definitions of equity are responsive to who these students are, where they come from, and where they want to go in life” [8].

We are currently reexamining this definition of equity as an RPP, and it has become increasingly clear that defining the word is not enough. Our examination of “what is equity?” is becoming more of a vision and a call to action, because actual equity involves moving beyond platitudes and idyllic notions of equality. It is a process that is difficult and sometimes painful. The very notion of defining equity requires action, moving the concept from an ideal to implementation. This realization should perhaps come as no surprise, as this RPP is focused on implementation, however, we hope to capitalize on bridging the definition with a collective vision, and a call to action. As a living, breathing and changing definition, the process and the product is coalescing our team as we collectively work to advance equity in education with computer science as our lens.

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