

Preparing to Facilitate *iCode* Curriculum

Preparing educators to integrate computer science education and ethnic-racial identity exploration using social justice youth development



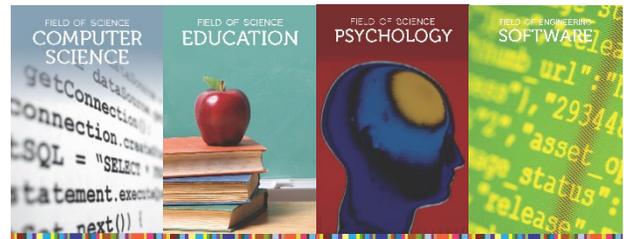
This document is for educators preparing to lead the *iCode* (identity-code) curriculum. This guide focuses on the teaching skills needed and is a companion to the *iCode* curriculum **introduction and background** and the **educator toolkit**.



iCode Curriculum

iCode is a 14-lesson (30-hour) curriculum designed to enhance middle school aged young people's computational thinking, computer science attitudes, and career motivations by focusing on identity and cultural heritage. By integrating culturally relevant and experiential learning experiences, lessons improve motivation and aspirations for ongoing computer science education. *iCode* incorporates computational thinking concepts through unplugged activities, block-based coding (Scratch), and BBC micro:bit microcontroller design. The lessons also encourage exploration, discourse, and reflection to foster a positive ethnic-racial identity.

iCode is designed for delivery in after school and summer programs. It can be taught by professionals, volunteer educators, or CS industry mentors.



Learning Goals

Computational Identity is ...

an individual's engagement with programming, their sense of identity with computing, and their continued motivation to learn programming. It includes recognition from peers and teachers, confidence, and interest in computing.

Ethnic-Racial Identity is ...

an individual's self-concept, attitudes, beliefs, and emotional attachments to their social-cultural group based on race and/or ethnicity. It is a dynamic and multifaceted aspect of identity formation, particularly significant during adolescence, and is influenced by social contexts, family, and culture.

Computational Thinking is ...

the skills used to formulate problems and solutions to be effectively solved by computers. Skills include decomposition (breaking down problems), abstraction (generalizing), algorithm design (creating efficient procedures), and pattern recognition (noticing structure in data).

Social Justice Mindset is ...

an individual's attitude and approach focused on recognizing and addressing inequalities and injustices in society, advocating for equity, and promoting systemic change to ensure fair treatment and opportunities for all, particularly marginalized and oppressed groups.

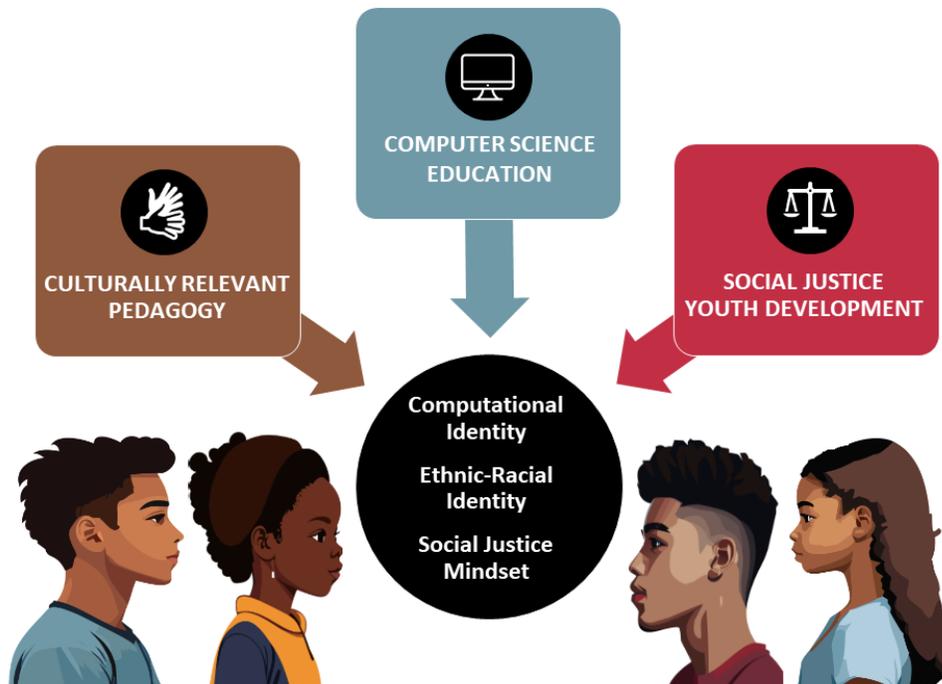


FIGURE COURTESY OF JANET KRATFEL

Core Educational Concepts

To strengthen youth’s ethnic-racial identity, computational identity, computational thinking, and social justice mindset require integrating cultural relevant pedagogy, computer science education, and social justice youth development.

Culturally Relevant Pedagogy

Culturally relevant teaching focuses on celebrating cultural identities through thoughtful learning experiences. It helps young people feel valued and respected. This teaching method supports youth in keeping their cultural identities and developing a critical understanding of the world. Children learn to see things from different viewpoints and challenge unfairness. To do this well, teachers need to build trust and relationships with families, create rules together, and help youth take action for social, political, and economic change.

Social Justice Youth Development

Social justice youth development (SJYD) builds on youth programs by helping marginalized youth take action together. SJYD focuses on understanding and changing unfair systems. It encourages young people to explore their different identities and get involved in community activism, addressing issues like racism, sexism, and economic inequality. SJYD helps young people become aware of their cultural and racial identities. The adults supporting SJYD need ongoing training to effectively help youth break down barriers of oppression.

Computer Science Education

Use computer science (CS) education as a form of *artistic identity expression* to help youth explore and share their ethnic-racial identity and cultural backgrounds. Educators can use a combination of unplugged group activities, block coding, HTML/CSS/JavaScript, Unity, TunePad, and microcontroller projects, to empower youth to tell their stories and address social injustices.

Organizational practices

What program coordinators need to do.

Recruit educators that share cultural experiences and identity markers with youth.

Adult educators need to share cultural history and identity markers with young people. Recruiting such educators who also possess expertise in both CS education and culturally relevant youth development may be challenging, so you may need to pair educators together.

Prepare educators to facilitate culturally relevant youth development (including social justice) and computer science education using critical experiential learning.

Educators must build relationships with families, provide opportunities for discussion and reflection, introduce cultural histories, validate students' existing knowledge, and adapt activities. Offer sustained training through communities of practice.



Teaching practices

What educators need to do.

Learn about and involve young people's parents and families.

Involve families to create a supportive environment and align programs with cultural values. Host welcoming events, maintain regular communication, offer family CS workshops, organize collaborative activities, and include families in program decisions. These activities will foster trust and support youth in identity exploration.

Position computer science education as artistic identity expression.

CS can help youth explore and express their ethnic-racial identity by learning about and sharing their cultural histories and traditions. A step-up/spiral approach is recommended, where youth engage in unplugged activities, block coding, web development, and microcontroller design to deepen their understanding of computational thinking. These activities foster engagement by building on youths' interests, allowing them to reflect their identities and address social injustices through creative expression and collaborative projects.

Provide role models with similar identities from CS industry.

Young people need to envision themselves as computer scientists. Educators can do this by having role models or mentors who share similar identity markers such as race, ethnicity, gender, and cultural values. Establishing diverse role models in CS education is crucial for increasing interest in CS careers, and these role models should also engage in social justice and be trained in both content and youth development to positively influence young people's ethnic and racial identity development.

References

Worker, S., Moncloa, F., & Mitchell-Hawkins, V. (in press June 24, 2024). Integrating computer science education and ethnic-racial identity exploration within a social justice youth development framework. *Journal of Youth Development*. <https://tigerprints.clemson.edu/jyd/>

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