Using Online Practice Spaces to Investigate Challenges in Enacting Principles of **Equitable Computer Science Teaching**



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Significance, Perspectives and Purpose

Computing plays a central role in the future of our communities, workforce, and society (Blikstein 2018), yet critical challenges remain in progressing towards more equitable and inclusive visions of K12 CS education (Margolis et al. 2015). And while many broader structures and policies influence K12 CS education, the "last mile" of CS for All is whether teachers can enact principles of equitable teaching in the classroom.

Previous work has shown that pedagogies of enactment like clinical simulation and role-playing hold great promise for teacher learning related to equity. Dotger and Ashby (2010) described "conditional inclusive ideologies" where teachers speak and write fluently about equity, yet struggle to enact equity during a simulation with mild social pressure. Self (2016) applied this approach to developing racial awareness, creating moments in simulation where teachers are "pulled up short" before guided reflection and facilitated discussion. Ball (2018) highlighted how focusing on "discretionary moments" can connect tangible teaching decisions with larger issues of equity and bias.

In this poster, we share research done in collaboration with colleagues in K12 CS teacher preparation programs, focusing on: 1) What kinds of teaching decisions do teachers make when given opportunities to enact principles of equitable teaching within online practice spaces? and 2) What kinds of beliefs or biases interfere with teachers enacting principles of equitable teaching?

What are principles of equitable teaching?

There are many! Teaching is complex and relational. This work focuses on three principles: positioning students with an asset framing (eg, Milner 2010), disrupting preparatory privilege (Margolis et al. 2010) and honoring intersectional identities (Crenshaw 1991).

This poster dives into honoring intersectional identities, see Robinson et al. (2018) for more. Intersectional identities are important aspects of students' lived experiences (Crenshaw 1991), and influence how students experience the classroom, particularly in communities like CS with unrepresentative populations. When students voice concerns or raise issues, it's critical that teachers acknowledge acknowledge racial, ethnic, and gender identities, and admit them into conversation (Self 2016).

For references, see Robinson et al. (2018) at osf.io/preprints/socarxiv/ygazx/ See github.com/mit-teaching-systems-lab for demos, code and curriculum.

organizations!





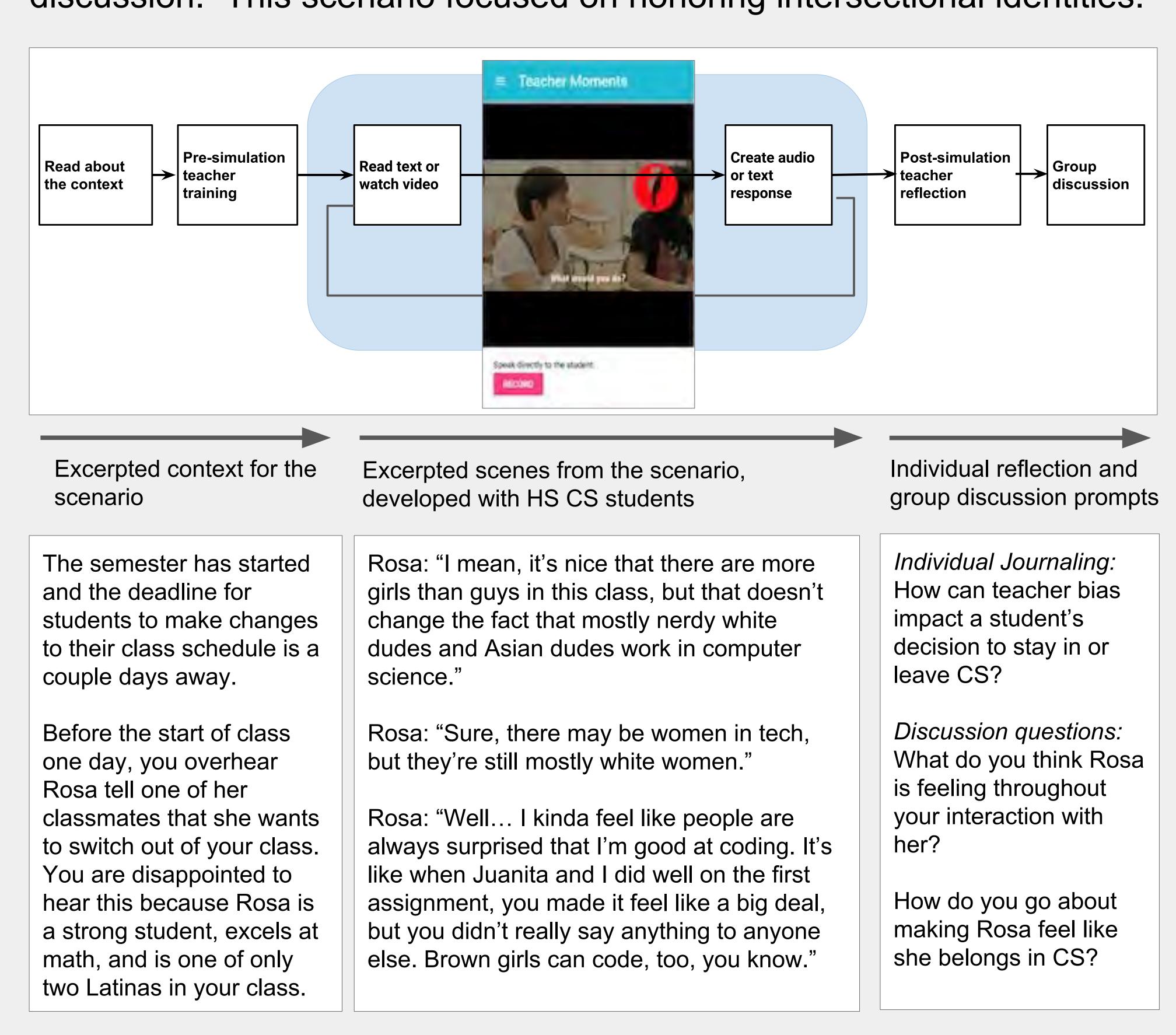






What are practice spaces?

Practice spaces are one kind of pedagogies of enactment, similar to role plays, teacher-learner-observer, or clinical simulations. In this work, we created a blended learning experience, where teachers tried a scenario on their own, reflected individually and joined an in-person facilitated discussion. This scenario focused on honoring intersectional identities.



Methods, Data and Results

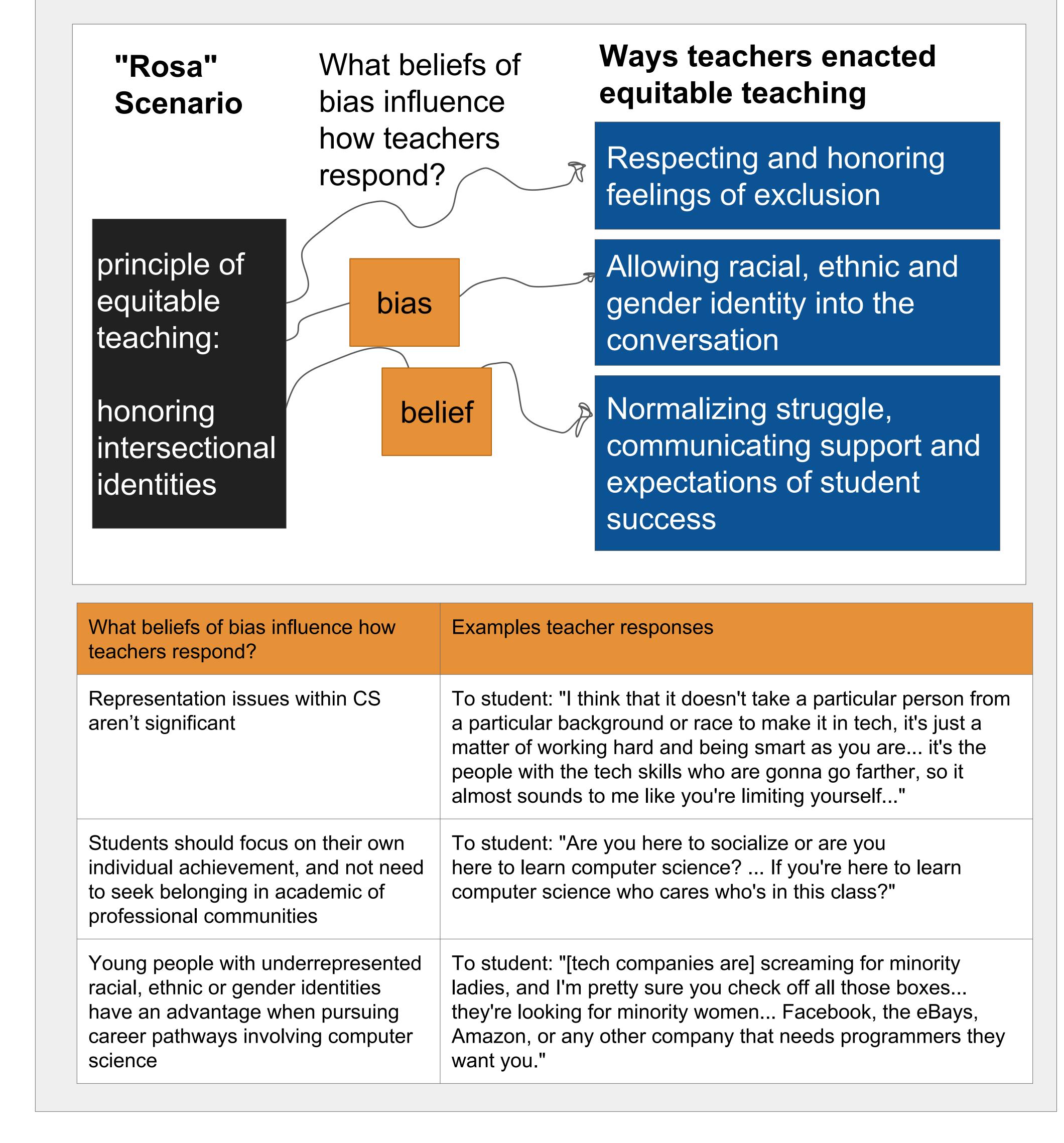
Our approach centers on creating practice spaces embedded across a wide range of blended settings for K12 CS teacher learning. Practice spaces are learning environments, inspired by games and simulations, that allow teachers to rehearse for and reflect on important decisions in teaching outside of the classroom (Reich et al., 2018).

One example of this is Teacher Moments, a mobile web app that immerses educators in short vignettes of classroom life, and then calls upon participants to react to complex situations with improvisational spoken or typed responses (Thompson et al. 2018). This allows teacher educators to create a shared experience for group reflection and discussion, and creates opportunities for co-creating new practice spaces that focus on the discretionary moments that are most important to particular communities of teacher educators, teachers, and young people themselves. This approach creates rich evidence for purposes of both formative assessment and research analysis, including: data recorded within the practice spaces during teacher reflections and responses, observations during small group and whole group discussions, posters and visuals that teachers created during sessions, and written responses to survey questions.

In this poster, we discuss early findings from six fields tests with particular classroom scenarios (n=45 participants). The scenario highlighted as an example in this poster was developed from conversations with high school computer science students, see Robinson et al. (2018) for more details.

What did we find?

The diagram below zooms into one scenario focused on honoring intersectional identities as an example, showing ways that teachers enacted equitable teaching within the scenario (blue). The table below describes beliefs of bias that appeared to interfere (orange).



Conclusion

This poster shares a few excerpts of our overal findings, which suggest that teacher beliefs around colorblindness, meritocracy, and individual accountability may interfere with enacting principles of equitable teaching. We also share four themes around the design of teacher learning related to equity. First, framing bias as "assumptions" may improve teacher participation and avoid challenges related to colorblindness. Second, practice spaces can create a shared experience for teachers, a neutral space for reflection on the different ways that teachers respond. Third, minimal scenarios invite competing interpretations from teachers, creating opportunity for reflection and discussion about how teachers' interpretations differ. Fourth, developing equitable teaching practices is far more complex than simple skill acquisition or a linear progression.

Future work might involve collaborating with K12 students to create more scenarios and avoid stereotypical, tokenized or monolithic group identities. Research might examine how practice spaces can be a pathway in to deeper equity work, or whether teacher performance within practice spaces is predictive of teaching decisions within classroom observation protocols or of perceptions of bias and equity expressed by students.