

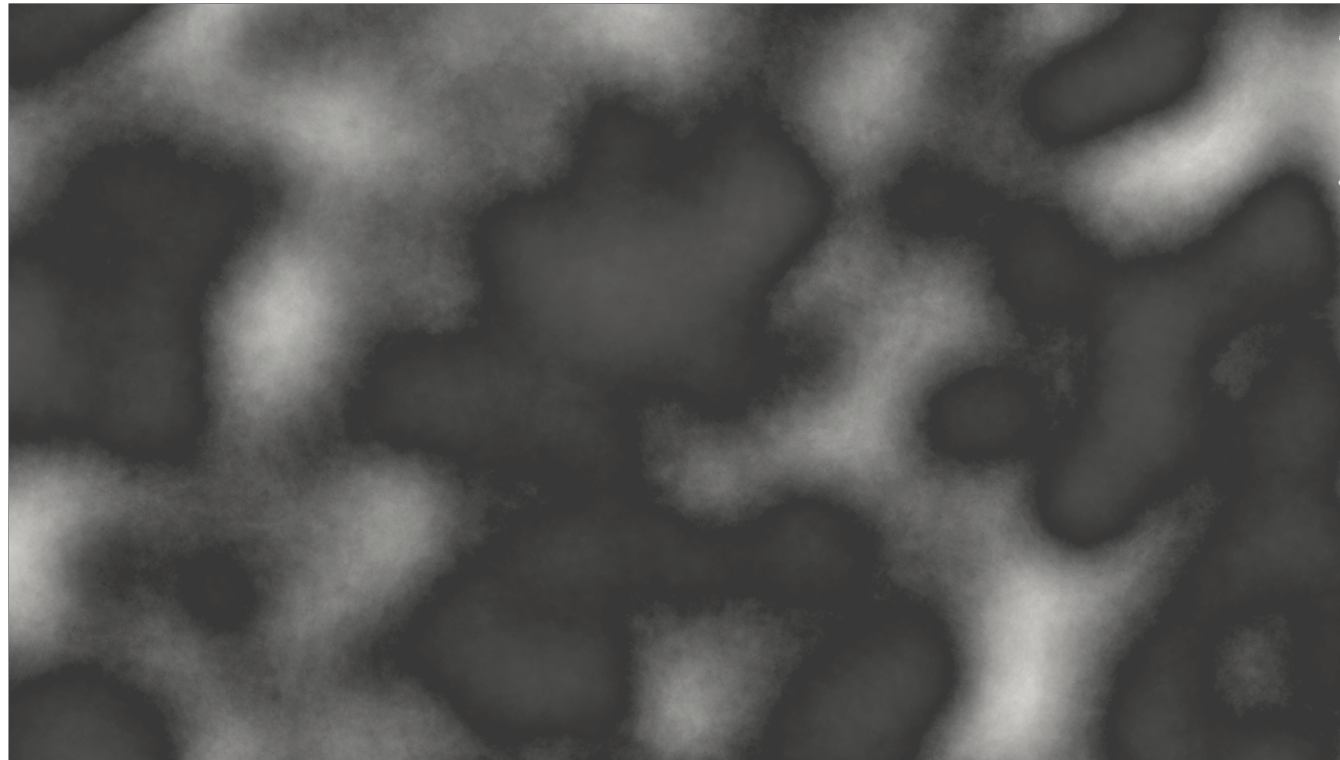
Love, Learning, and Computing Education

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- Thank you for the introduction and for the invitation to speak.
- Two notes before I begin:
 - This is an adapted version of the keynote that I gave recently at SIGCSE 2026; apologies if you've already seen it. But if you haven't, and you want to hear more, you can see the full version on my website.
- I'll speak for 20 minutes, then we can discuss for 20 minutes.
- (pause)



- There is a dark cloud over our heads.
- And it's a cloud of hate, cruelty, and violence, in this country.
- Many of the people here, myself included, are in distress or in active resistance, and that our experiences in this community are just a small glimpse of the far greater harm happening in this city, this state, this country, and this world.
- And yet, while there is so much more I could say about this moment, and while our ability to understand what is broken is central to fixing it, we also need to talk about the world we want.
- And so that's what I'd like to do today, at least for our corner of computing education, and the many impacts that we have on the broader world.



- In that spirit, I want to ask:
 - What should computing education be, if not hateful, cruel, and destructive?
 - What values should we center in education, if not division and domination?
 - How can we focus our attention on those values?
 - What kind of systems of learning and education do we need to enable these values?
 - How might those systems play part in moving us past this broader era of hate?
- I want to build on these arguments today, suggesting that at the heart of these ideas is a very particular kind of **love** that we rarely talk about in education, and in computing education in particular.



- Now when I say love, you're probably thinking of everything this pink heart represents.
- But I'm talking about the kind of love that shows up when someone truly cares for someone and about someone.
- The kind of love that great teachers give students, in supporting their security, transformation, and growth.
- The kind of love that focuses teaching on meeting students where they are at and with what they need.
- I want to talk about this love, and how we might center it not only in our teaching and research, but in our defense of schools and higher education from the U.S. government, and the world we will need to build from what remains of our institutions.
- I'll share my thoughts in 5 parts.
 - I'll start by talking about my own experiences with love in computing education.
 - I'll then discuss the nature of love, and its complicated relationship with teaching and learning.
 - I then want to unpack love's fraught relationship with computing and computing education.
 - I'll then share a few examples for how to center love in computing education practice and research, giving us a path forward toward healing our part of this broken world.
 - I'll end with a call to action for each of you, hopefully giving you a frame in which to think about this conference, but also your broader work and role in this world.

Part I

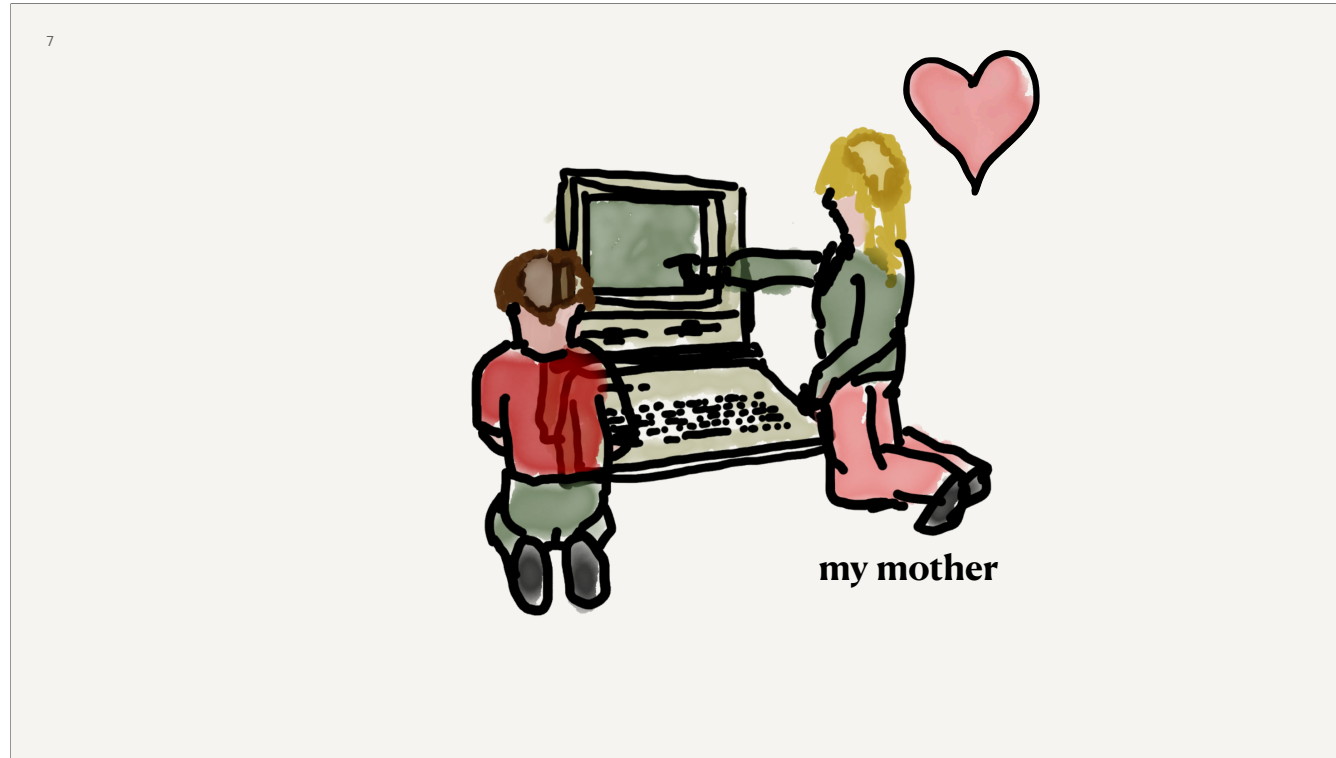
A biography of loving CS learning



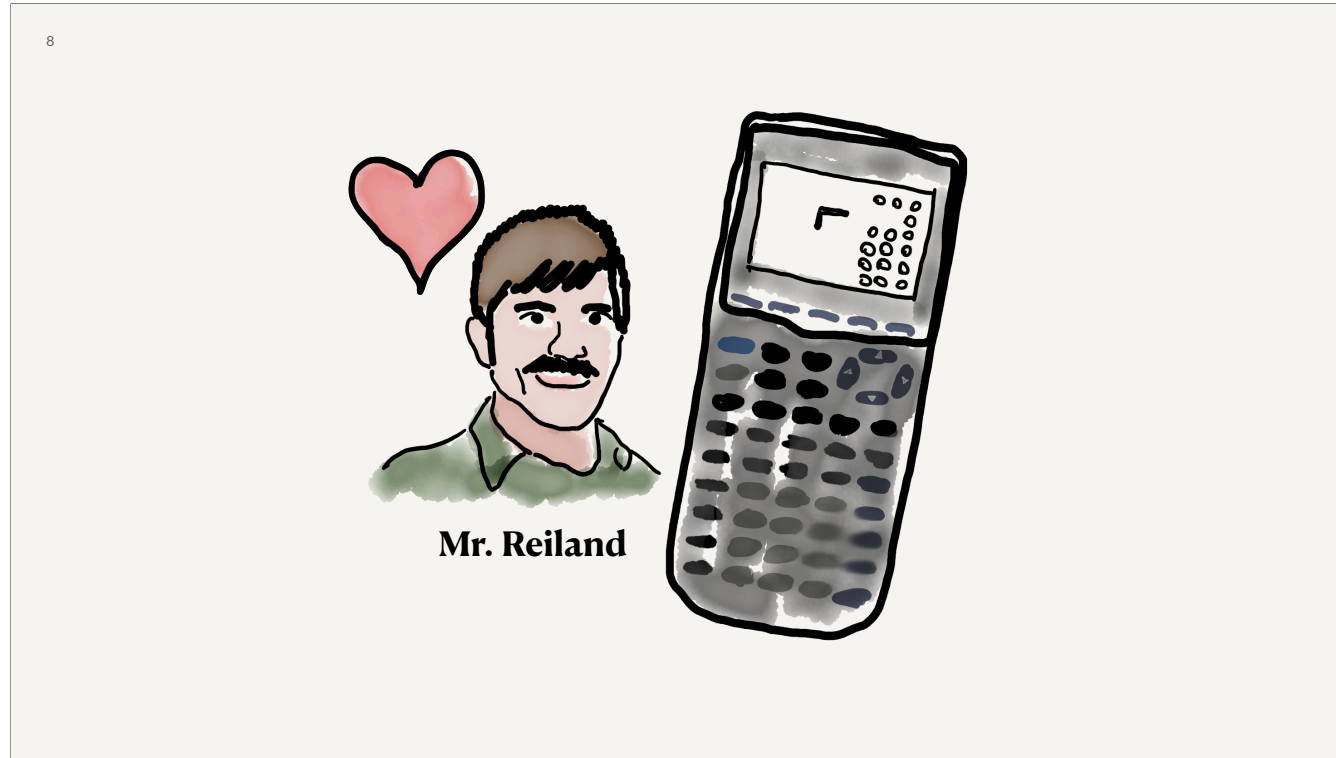
- I'll start with my own biography of love in CS learning.
- I did not grow up with a lot of it love in my life: it was full of bullying, poverty, death, and hiding.



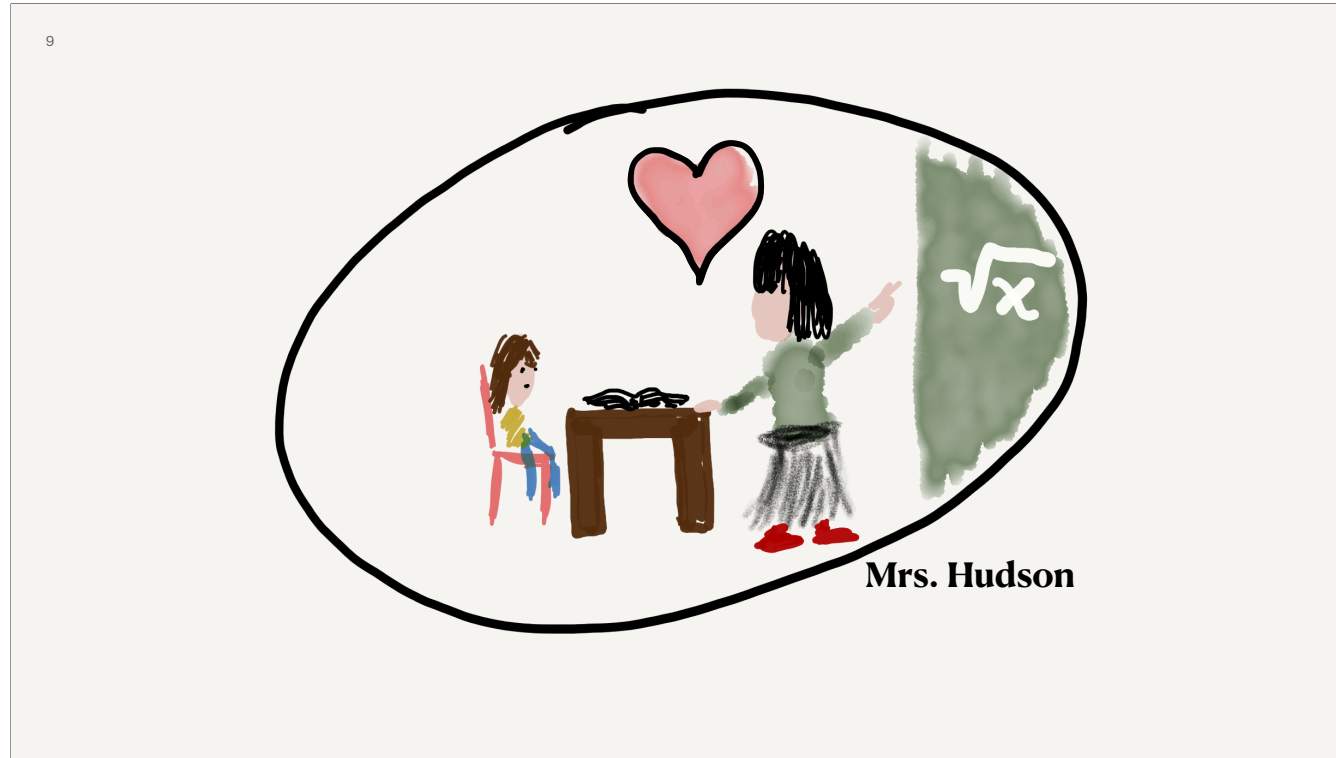
- But love was abundant in one place in my life: learning.
- And in particular, learning about computing.
- I show myself here, staring at this screen from every angle, to represent how the many possible worlds that computing helped me create and imagine were an escape from the hostile world I was in.
- Computers kept me alive and gave me refuge; over time, they also gave me purpose.
- But it wasn't computers alone, or even computers especially.
- It was fundamentally the people in my life, who loved me, and embraced my fascination with computers.
- Let me share a few stories to illustrate.



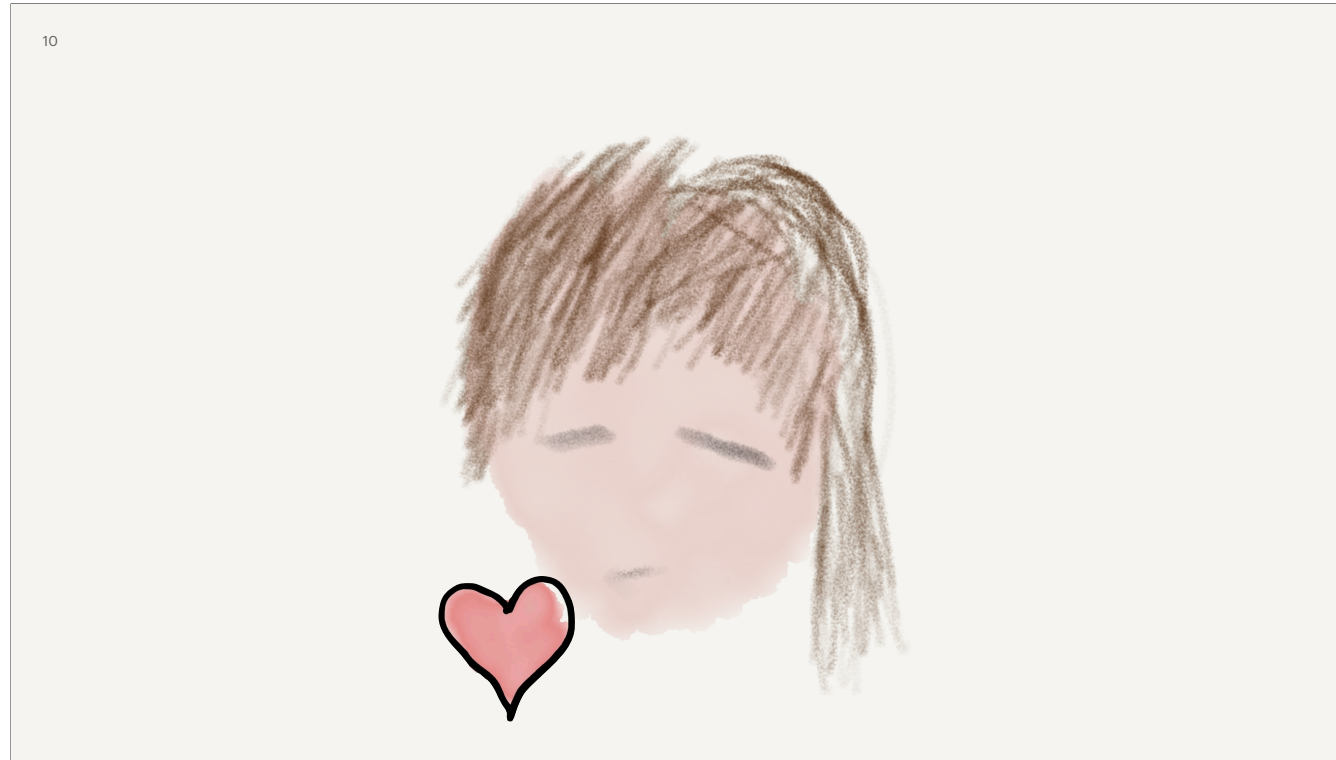
- In 1989, when I was 9, my mother, a 5th grade teacher, became enamored with computers. She was obsessed with the idea that they could be a place for play and productivity, and she saved up, buying our family an Apple IIe.
- She didn't have a particular vision for what we would do with it. Instead, she believed in a vision that it might be useful for something. It was delivered after school one day, and I got home before she did, and I dragged in the three big boxes.
- I was fascinated by it. I tore open the boxes, I started putting things together based on the instructions inside, and by the time she was home, I had it on the floor, with floppy disks inside, where I had found a word processor and a strange home simulation game, called Little Computer People.
- This is an illustration of what happened when she came home. She was not angry with me; instead, she came into the living room, and said, "What do you notice?" She sat with my brother and I for hours, as I showed her what I'd found, what I didn't understand, and we tinkered and learning together, seeing what it could and couldn't do.
- That evening at dinner, my mind was spinning. What could it do? Could I make it do things? What couldn't it do? I knew that day that it did not matter what I wondered, what I asked, or what I wanted to learn: my mother would be there, wherever I went, learning with me.



- That same year, I started pre-algebra, and our teacher Mr. Reiland, had us buy the TI-82 graphing calculator shown here.
- By then, I was fascinated with computers, and a portable computer that looked remarkably like my beloved GameBoy was a dream come true.
- A classmate had an older brother who had a version of Tetris on it. I ordered a link cable, transferred it a month later onto my calculator. I was disappointed to find that it was very slow; pieces would erase and re-render on the order of seconds.
- I spent weeks trying to understand how the game was built, reading and re-reading Chapter 5 of the manual, and eventually found that the text console rendered much faster. I rewrote the rendering to use letters and punctuation as Tetris pieces.
- I was so excited, I shared it with everyone in my math class, and everyone was playing Tetris on their calculators instead of learning pre-algebra. It was a classroom management disaster, but also suddenly a game party.
- My teacher, Mr. Reiland stopped the class, and rather than scold me or confiscate our calculators, he said “That is so cool. Whoever made this, teach me how you did it after class, and we can teach everyone else.”
- I stayed after over the lunch period, showing him what I’d done, and he told me how proud of me he was for learning, for sharing, and for teaching him. We spent many lunches after that learning about the rest of the calculator’s functionality together, and he brought that learning into our math education.
- I spent the rest of the year with pride my curiosity was valid, in school, and in math, wherever it might take me.



- In my third year of high school in 1997, and I was a junior in Calculus. I had gotten very interested in creating virtual worlds with organic shapes. I wanted to create interactive digital art that captured fractals and liquids, and all the books I'd read on 3D graphics used triangles, which were far too angular. Ellipses felt way more organic, and I so I started rendering ellipses in 3D space.
- The problem was, on our ancient Intel 286 school computers, drawing ellipses was super slow. I had figured out an algorithm to render them using the formula I'd learned in Geometry, but it used square roots, and it was the roots that seemed to be slowing everything down.
- I asked my teacher, Mrs. Hudson, shown here pointing to a root on a blackboard, if she knew of a fast way to calculate square roots. She said, "That is a fascinating question. I don't really know what that even means, but I think I know who to ask! Let's find out together"
- It turned out that she had a PhD from Texas A&M, and so she wrote to her former advisor. He mailed a 90-year old book on interlibrary loan from MIT, which was full of all kinds of manual algorithms for computing approximate roots, but in archaic math notation. And so she sat with me after school for a few weeks, translating the chapter into modern math syntax. I then translated the math into an algorithm.
- My ellipses rendered 100 times faster, and I spent the rest of that summer cleaning spills at my summer grocery store job, and making weird organic 3D art for my teachers and friends. I knew that it did not matter what it was, or why I made it, only that it was me who was making it.



- It took me a long time to understand these and other learning experiences. For how they shaped me. For how it was my own interests that drove them, and how I had parents, siblings, and teachers that met me where I was at and wherever I was going.
- For how a certain kind of love was at the center of all of these, and it was the love that made each of them push myself forward, further, to wherever I might go.
- And in many ways, this love in learning, and of learning, was what saved me. It created a space of safety, of affirmation, of care. I was able to build a sense of self-worth around computing, to compensate for the complete lack of self-worth I had for myself in most other ways.
- But it was also a story of privilege. Of well prepared teachers with time to respond to my interests. Of a school with computers. Of a mother who was a great teacher and curious about computers.
- This was not the experience of most children in the 1980's and 90's, and it is no accident that I am here on this stage, with a PhD, in the positions of power that I hold.
- This moment is the outcome of a consistent, uninterrupted sequence of unconditional loving support, interest development, and opportunity that easily overcome the loss, grief, and turmoil in every other aspect of my life.

Part II

What is love in learning?



- Theorizing about love is not new. It is also fraught, because love can mean so many things.
- And so I want to take a moment to be a bit more precise about what I mean by love in learning before we return to computing and computing education.

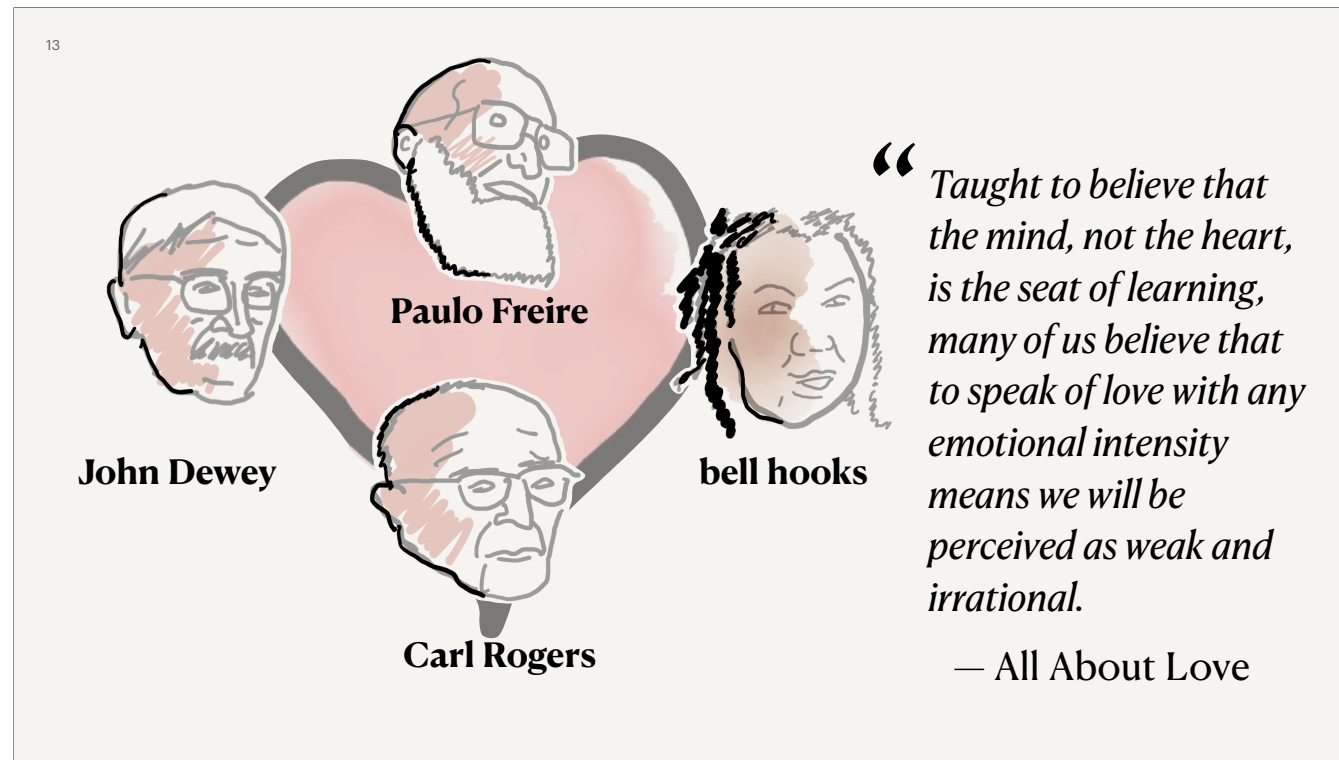
ἀγάπη στοργή

ξενία φιλία

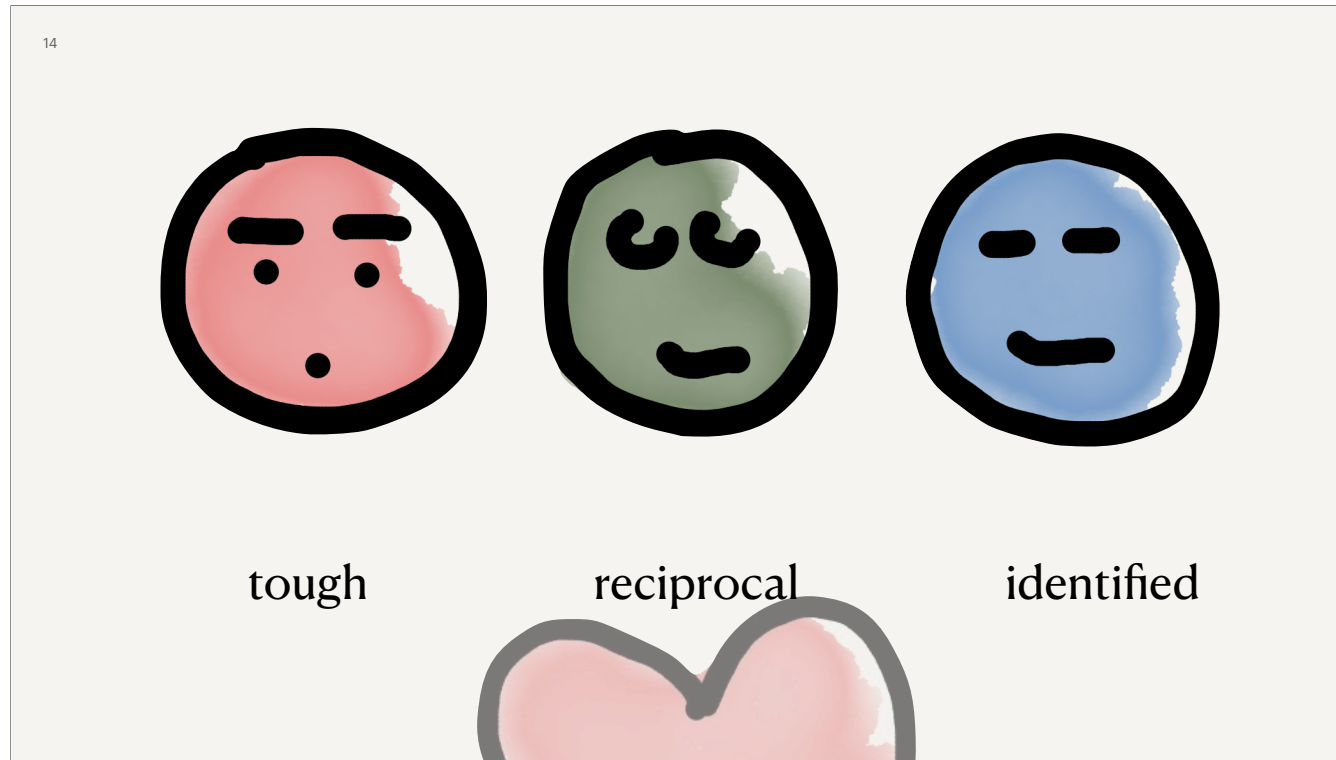
φιλαυτία



- We also can't talk about love without first acknowledging the impact of Greek philosophers on Western conceptions of love.
- The Greeks had so many kinds of love, but there are few that I find relevant to learning. Canadian psychologist John Alan Lee organized them into several types back in the 1970's.
- This includes agape (ἀγάπη, universal love), is storge (στοργή, a kind of familial from a parent), xenia (ξενία, for newcomers and and foreigners)
- There is philia (φιλία, a collectivist love), philautia (φιλαυτία, a love of self), and the Japanese sebomai (a kind of reverential love, such as that given to teachers).



- Education researchers like John Dewey and Paulo Freire also spoke of love as a kind of liberatory agency.
- And counseling psychologist Carl Rogers, who wrote about the necessary and sufficient conditions for therapeutic relationships:
 - A caregiver’s unconditional positive regard,
 - an empathetic understanding of someone’s internal frame of reference, and
 - the explicit communication of this understanding.
- And then there is bell hooks who wrote on both love and learning, and of how we devalue it. She writes: [Read quote].
- These show that love in teaching might be about perspective taking and acceptance.
- These ideas also mirror studies of parents’ desires around how teachers relate to their students show that parents want more than care: they want a kind of professional love to be a kind of complementary love to parenting, about a students’ mind, growth, and wellness.



- But my favorite recent work is a paper by art education researcher Igor Jasinski & Tyson Lewis from 2016.
- They wrote about the inherently problematic ideas of love in learning shown here:
 - **Tough love** is a kind of stern love that loves a student for what they will become, but not who they are or who they want to become. “I’ll love you if you learn C++”
 - **Reciprocal love** is a kind of transactional love in which teachers love a student for how the student transforms the teacher. “Your passion for generative AI inspires my research”
 - **Identified love** is one in which teachers love a student for their identity as it is now, but in a way that positions identity as static, and precludes change. “I’m so proud of you for becoming such an excellent theorem prover.”
- Jasinski and Lewis argue that all three of these that show up in education are fundamentally conditional: they are offered only on the basis of a learner achieving, behaving, or being a particular way.



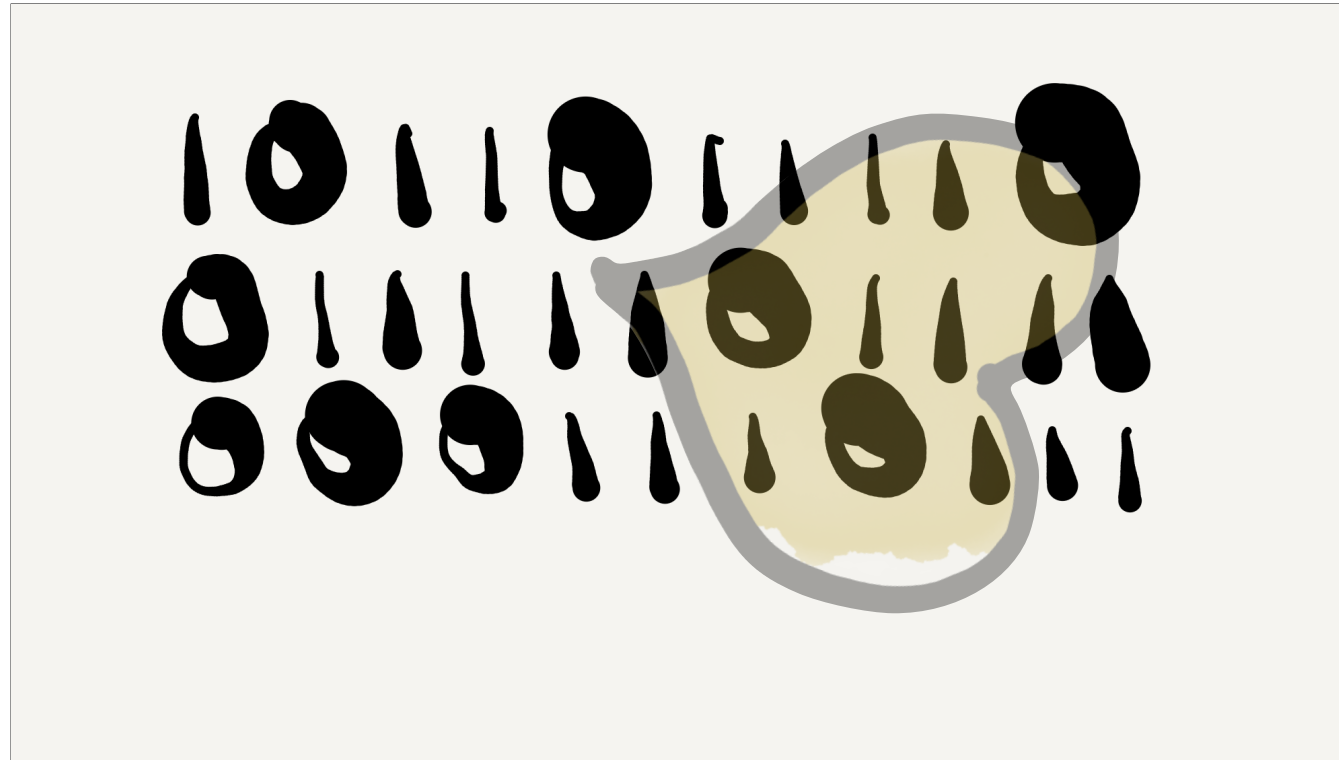
- Jasinski and Lewis argue that the only kind of love that truly respects students' agency, dignity, and capacity for change is a whatever love, shown here as a yellow smiley face.
- Whatever love loves a student for who they are, for their ever evolving positionality, and for whatever transformations that might entail.
 - *"I love you because you are you, and not more or less because you do or don't like computing. But I will also love you for whatever skills, talents, and interests you might grow, whether those have to do with computing or not. My positive regard for you is unconditional, and I will walk with you, wherever you go, whoever you become."*
- It's this idea of love that felt most true to the love I felt from my mother, my brother, and my teachers.
- Each of them said, "I love you for who you are now, interested in floppy disks, dungeon trolls, Tetris, animation, square roots. But I also love you for whomever you become, whether a CS major, a PhD student, a Professor, or a late blooming woman, learning to love herself. Who you are now is enough, and who are you later will be too."

Part III

Whatever love and computing



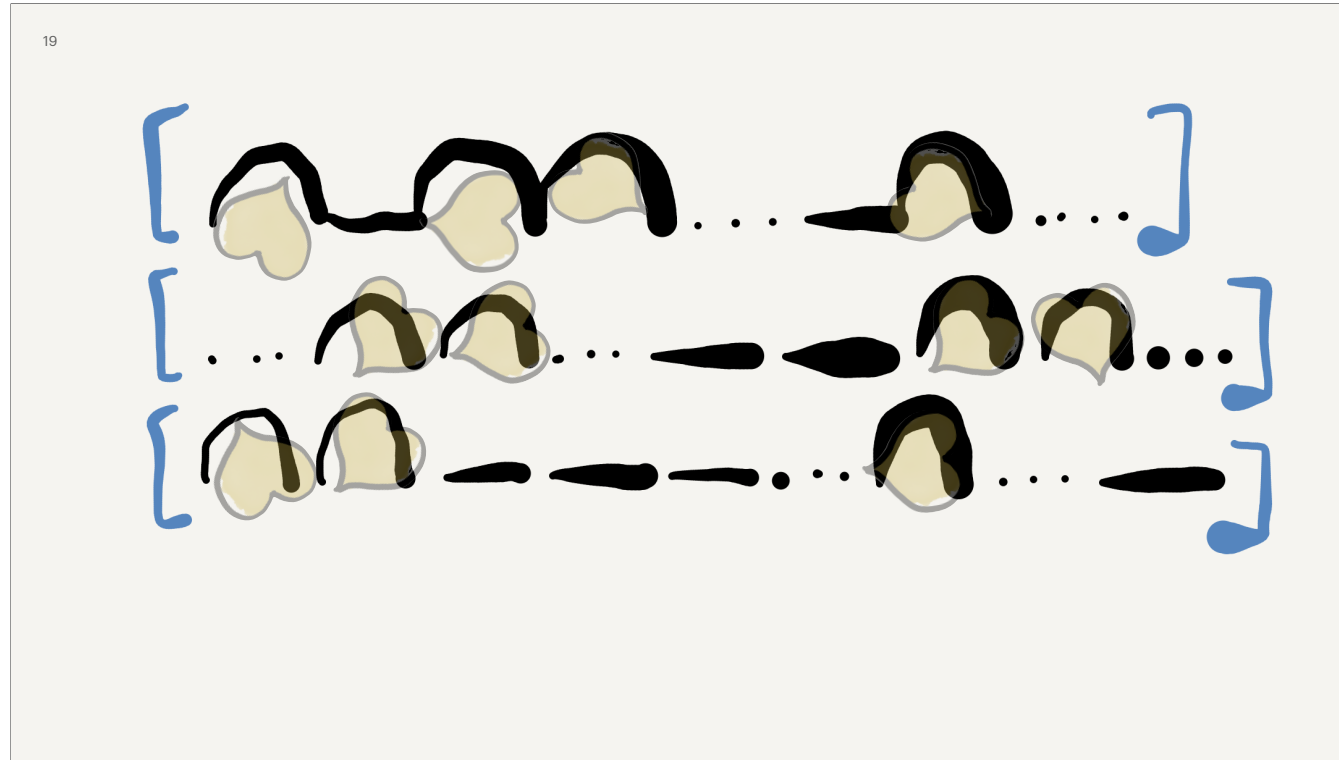
- What, if anything, does a “whatever” love have to do with computing and computing education?
- I want to argue that whatever love, and the ideas of computing, are in great tension.



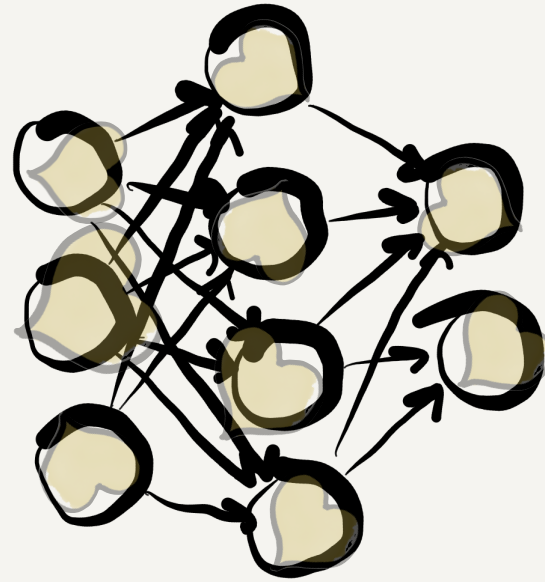
- One conflict between whatever love and computing is at the foundation of binary and discrete logic.
- Take Claud Shannon's idea that every message we might send is reducible to bits with prescribed meaning.
- This is an idea that disregards that messages are contextual, situated, momentary. It rejects the idea that the messages we send each other, the documents we create, are contextual, framing them instead as abstract and devoid of humanity.
- To digitize is destructive and perhaps even dehumanizing, erasing the importance of social context, and the inherent indescribability of information.
- This is not a whatever love. It is an erasure of positionality, of speaker, of meaning.



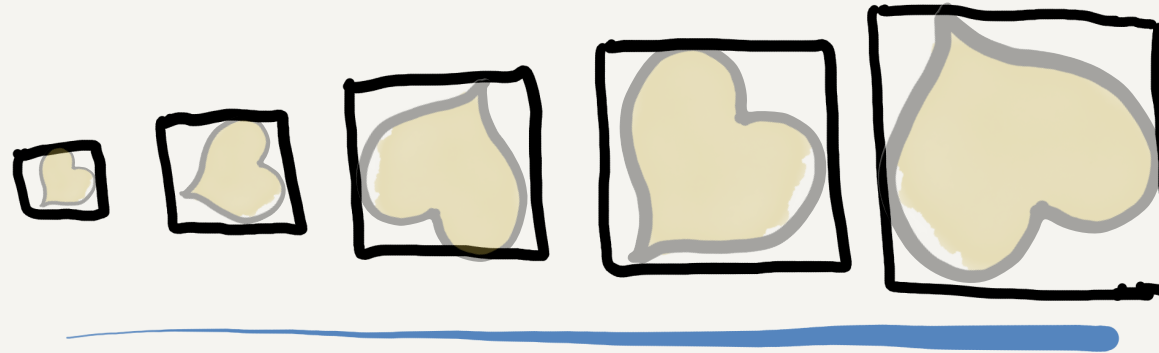
- Whatever love is in tension with data structures as well.
- Here, this structure that encodes gender, race, ability, and nationality as a sequence of bits starts from the premise that every idea that everything we might want to remember in a digital store can be categorized, classified, delineated, structured, and even expressed.
- This disregards the many ways that our memories and identities are constantly remade, by our experiences, by our remembering, that even the structure of how we organize our self conceptions can be reshaped by cultural change.
- Data structures, in contrast, harden things for what they are now, and how they are structured now, but do not easily allow for transformation, especially of structures themselves.
- I know this because of the hundreds of hours I've spent trying to change my name across thousands of databases whose data and schemas I cannot edit.
- This is not a whatever love. It is an erasure of agency.



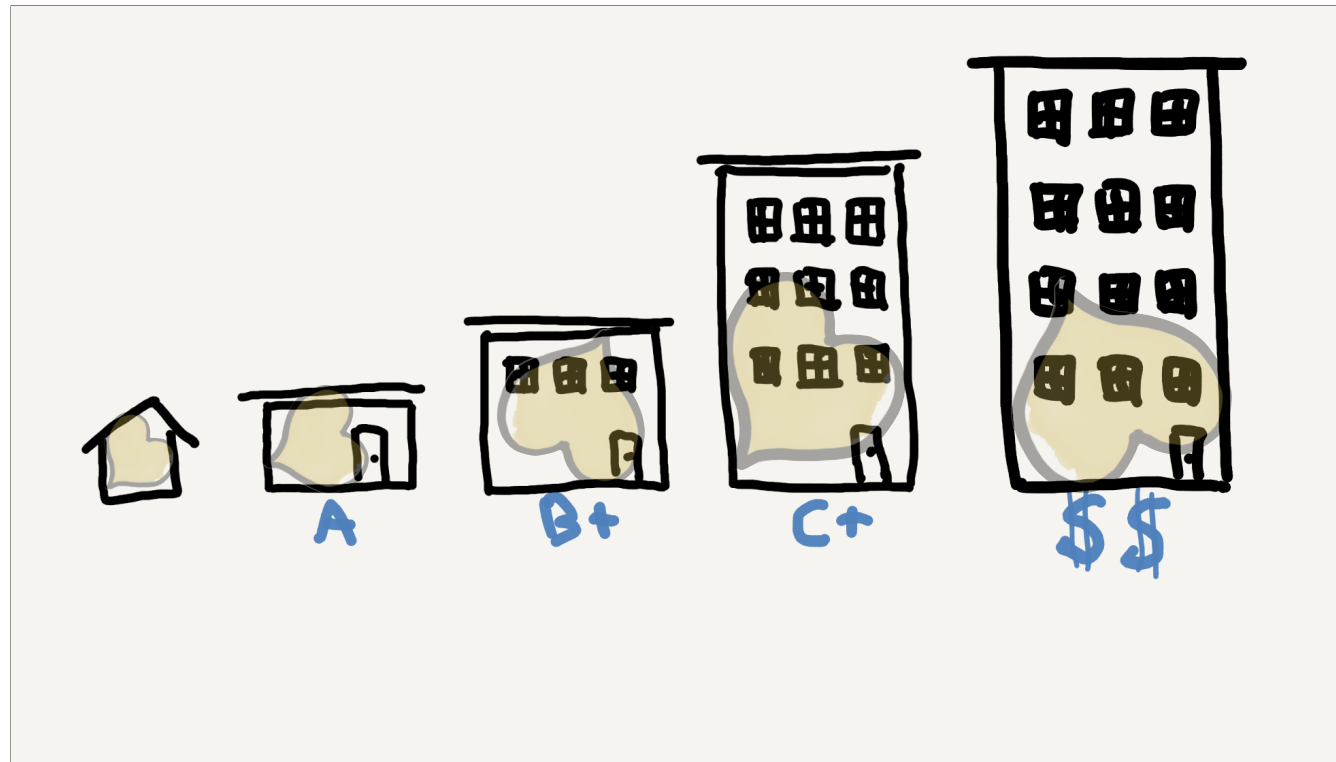
- Algorithms fare no better.
- The premise of an algorithm is that every meaningful action in the world is sufficiently reducible to a series of steps, deterministic or probabilistic.
- This algorithm visualization of decisions and passes and lists and operations entrap our actions in the world into structures, processes, and procedures that we do not shape, and that do not reflect the diversity of human action.
- This is not a whatever love. It is an erasure of human action's true nature, as emotionally-guided fallible reason.



- Our latest meaning for AI, the billion parameter convolutional neural network, poses its own fraught tensions.
- We train them on data that is a record of the past that was never meant to determine our future.
- The plausible output genAI produces has started to become our reality, creating fake news, fake citations, fake programs, fake writing, fake images, fake realities.
- This is not a whatever love. It is a rejection of reality, and the idea that culture, language, ideas, and identities are in our minds, not in our recorded histories, and the language embeddings they imply.



- Overall, computing is a medium for archiving brittle, reductive models of human experience, identity, and action, for normalizing action.
- It is a box in which we place ourselves, where the love we give each other is increasingly a resistance to its confines, where we try to make the box large enough to contain humanity's multitudes, but where people on its edges are crushed.
- Computing is a medium that is therefore fundamentally anti-positional. It leaves no room for loving people for who they are or might become. Instead, it is designed to lock us into structures, into history, and into rules that someone else has deemed normal or likely.
- That we use computing to uncritically shape our world and experiences, is to constrain and harden what we are, individually and collectively, creating friction in our transformation and liberation.
- This is not a whatever love, or any other kind of love I know of. It is a prison.



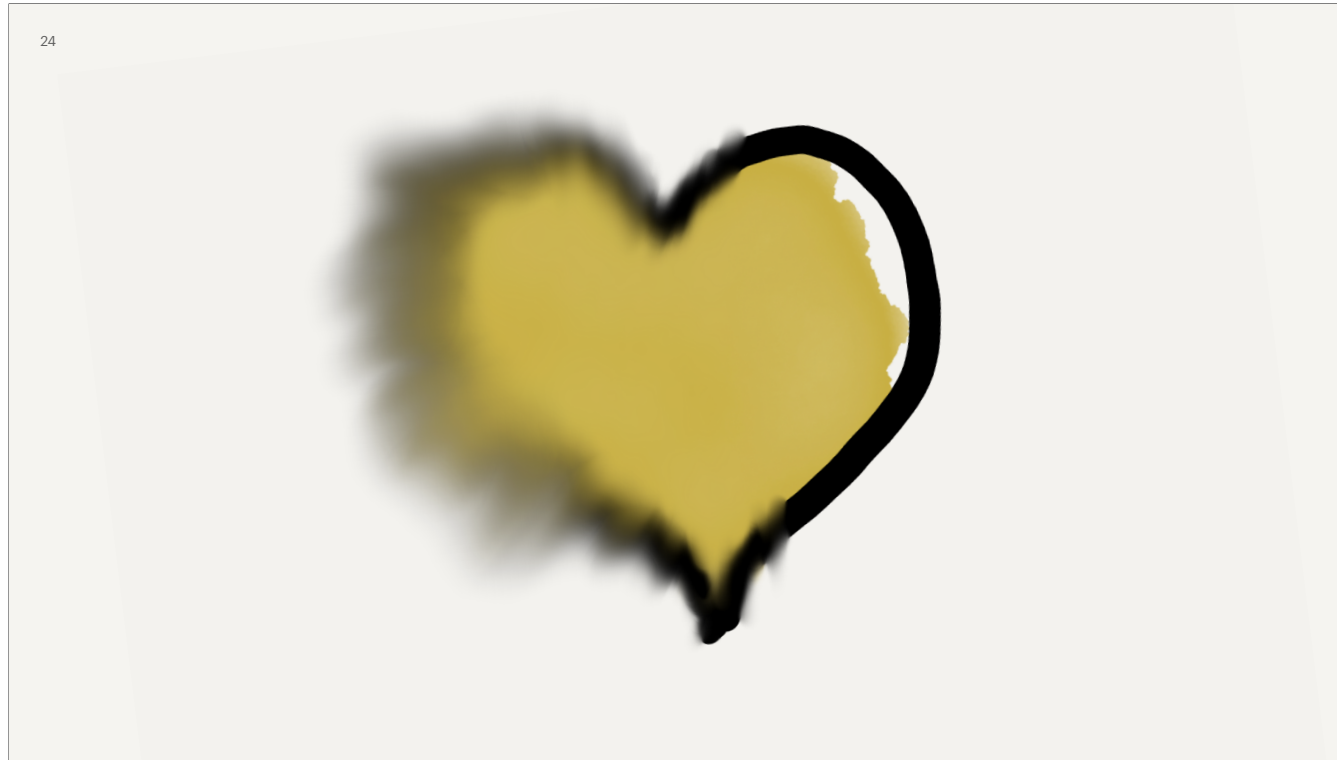
- And then there is computing education itself.
- I sometimes think of education systems as boxes of their own kind. A home, a school house, a college building.
- These are boxes in which our dominant form of computing education has been captured by a political economy of colonization, profit, exploitation, greed, displacement, replacement, policing.
- Our goals are not to see people's humanity and help it flourish, but to mold students into the right shape of cog, to be shoved into the machinery of Amazon, Google, Microsoft, Meta, Apple, or elsewhere.
- Companies and even not-for-profits fight to replace the creativity of a teacher's whatever love classroom with uniformity, chasing scale over relevant, responsive, and sustaining learning.
- We talk of computing education as a "pipeline", fueling profit in industry, as if students are an ancient oil to be pressured through tubes at high speed, as opposed to unique individuals, with many paths, and agency, and dreams that go beyond whatever network of channels our institutions have constructed.
- Rather than see cheating as a symptom of a failed system of credentialing, gatekeeping, and inequity, we position ourselves as police, detecting and punishing students trapped in the cracks of inhumane structures, often ones we design ourselves in assessments policies.

Part IV

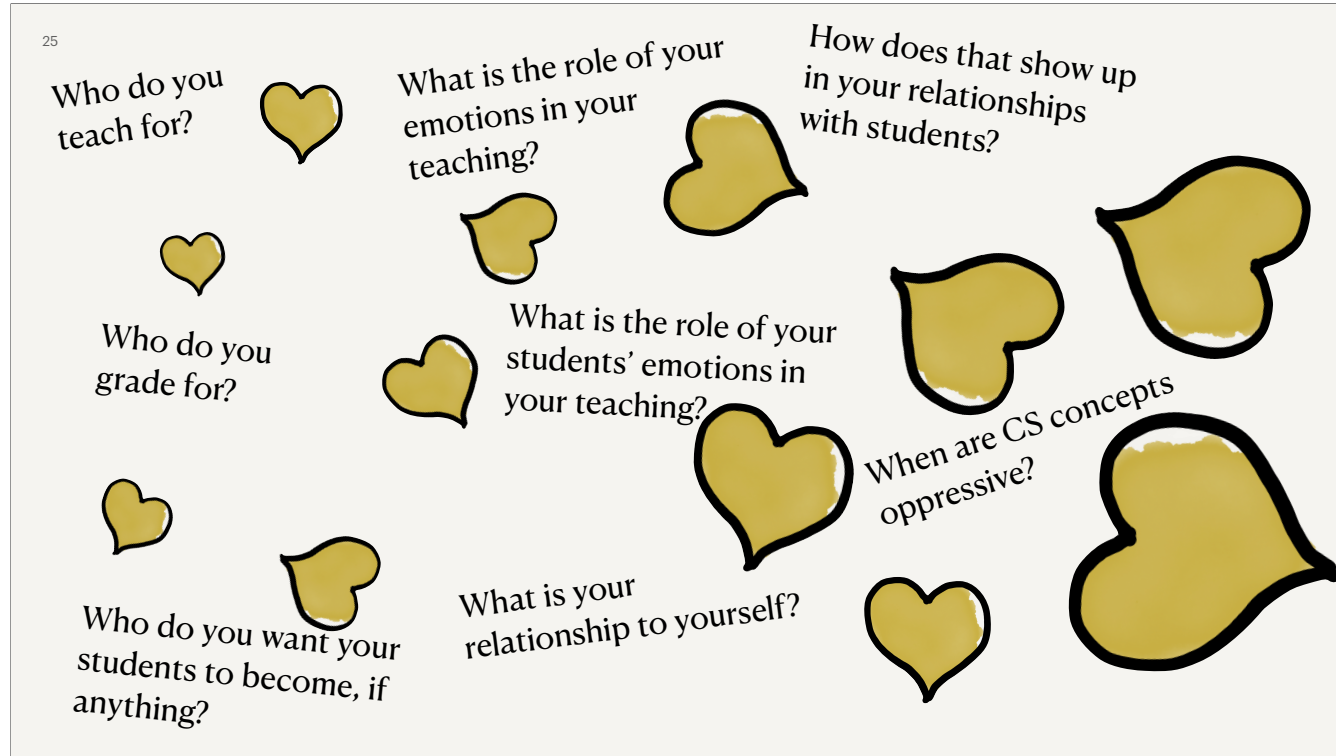
Reflecting forward



- What does this mean for us?
- I'd like us to reflect forward for a bit, and then I'll take questions.



- What does this mean for us?
- As I noted before, I have not had a lot of love in my life, from others, or from myself. I never particularly wanted to control my students, but I also never particularly had the capacity to love them. I had to learn to love myself before I could give them the “whatever” love they needed to thrive.
- And that was a long journey of not only accepting my gender identity, but also processing the immense amount of other pain and trauma from my childhood and adulthood. That meant therapy, tears, disorientation, rejection, and loss.
- But as I’ve found enough peace in myself, even amidst a pandemic and ongoing hate and cruelty in the world, I’ve begun to learn to nurture and grow my capacity for love, and bring it into my own teaching.
- And in doing that, I learned that in my teaching, I replicate the relationships I have with myself. When I loathed myself, internalizing the world’s loathing of me, I projected loathing on others. And when I love myself, I began to love others for themselves.



- Your journey might be different.
- In fact, there are many kinds of whatever love you might give in computing education, and many ways to become the person who can give it.
 - Perhaps it involves therapy
 - Perhaps it involves your faith.
 - Perhaps it involves just plain old reflection in action, as Donald Schön would say.
- And so rather than give advice, I give you the questions I asked myself, to guide my own reflection:
- [Advance build]
 - Who do you teach for?
 - Who do you grade for?
 - Who do you want your students to become, if anything?
 - Who will you become, as a teacher?
 - What is the role of your emotions in your teaching?
 - What is the role of your students' emotions?
 - What is your relationship to yourself?
 - How does that show up in your relationships with students?

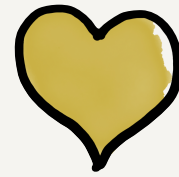


- I won't pretend that answering these questions, and realizing a loving computing education, is enough to part the dark clouds behind us.
- Far from it. Centering love, even just in computing education, may invite more hate.
- I do think, however, that love, and the specific kind of "whatever" love in teaching and learning, is a vision we can fight for. And a vision that if we realize, is enough to transform our computational future, and perhaps our political futures as well.
- And so whoever you are at at this moment, and whoever you will be this week and into the future, I can't wait to find out who you will become and how you will transform your learning, and maybe your teaching someday.
- And I look rebuilding our institutions from this fascist rubble, and to all the transformation it will enable.

Love, Learning, and Computing Education

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- “Whatever” love is key to learning
- Computing (education) lacks “whatever” love, in concept and culture
- We can make it loving through justice, joy, art, freedom, identity, culture, difference
- We have much to do to realize this in research, practice, and community

Thank you NSF, Mara, Jayne, Adrienne, Gayithri, and everyone in the UW Center for Learning, Computing, and Imagination for support, ideas, critiques... and love!

Suggested readings

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- Kirdani-Ryan (2023) *Identity fragmentation in post-secondary computing education*. Dissertation
- Woglom, Jones (2025). *The Jam: Speculative-Mutant Pedagogies, Aesthetic Education Theory, and Becoming Joy with Children in a What If World*. Teachers College Record.

- Thank you, let’s talk.