ADDRESSING THE UNDERREPRESENTATION OF BLACK WOMEN IN COMPUTER SCIENCE

Problem of Practice by Alberto De La Cruz

EDLD 9434 – Transformative Educational Practice I
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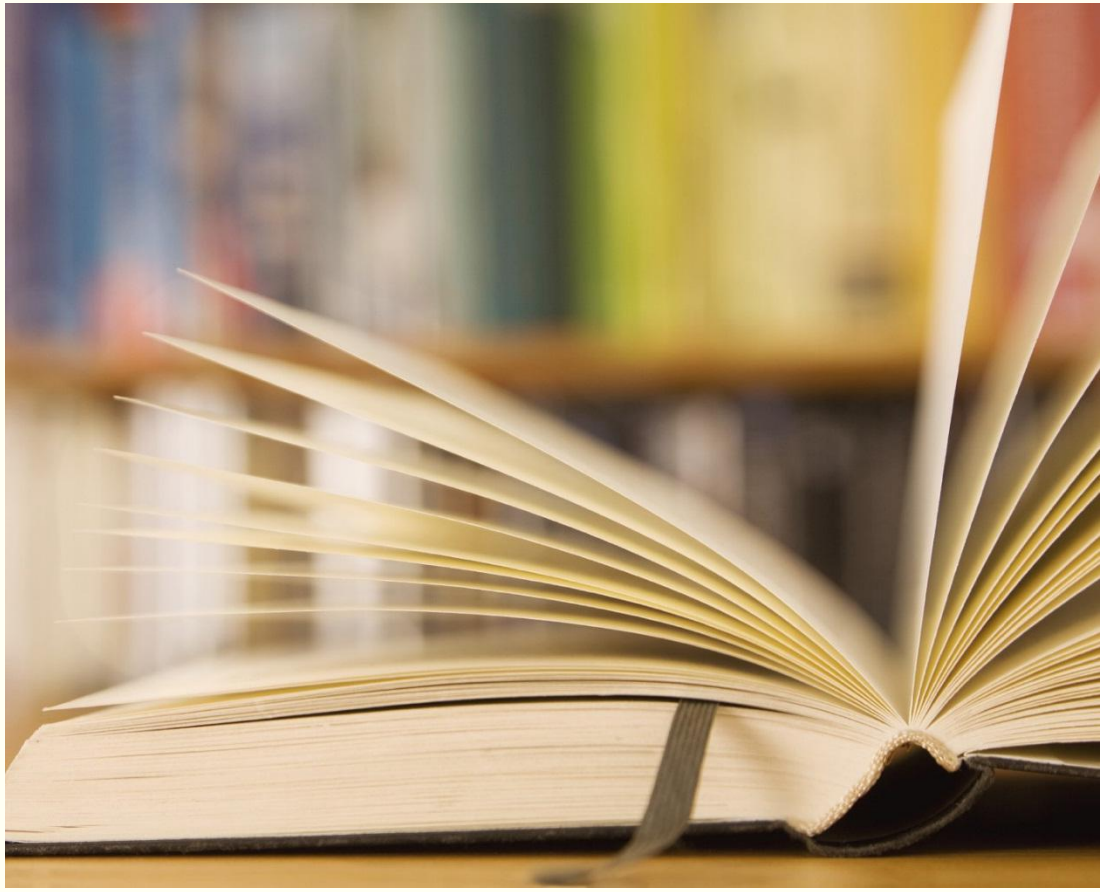


Problem of Practice: Underrepresentation of Black women in Computer Science

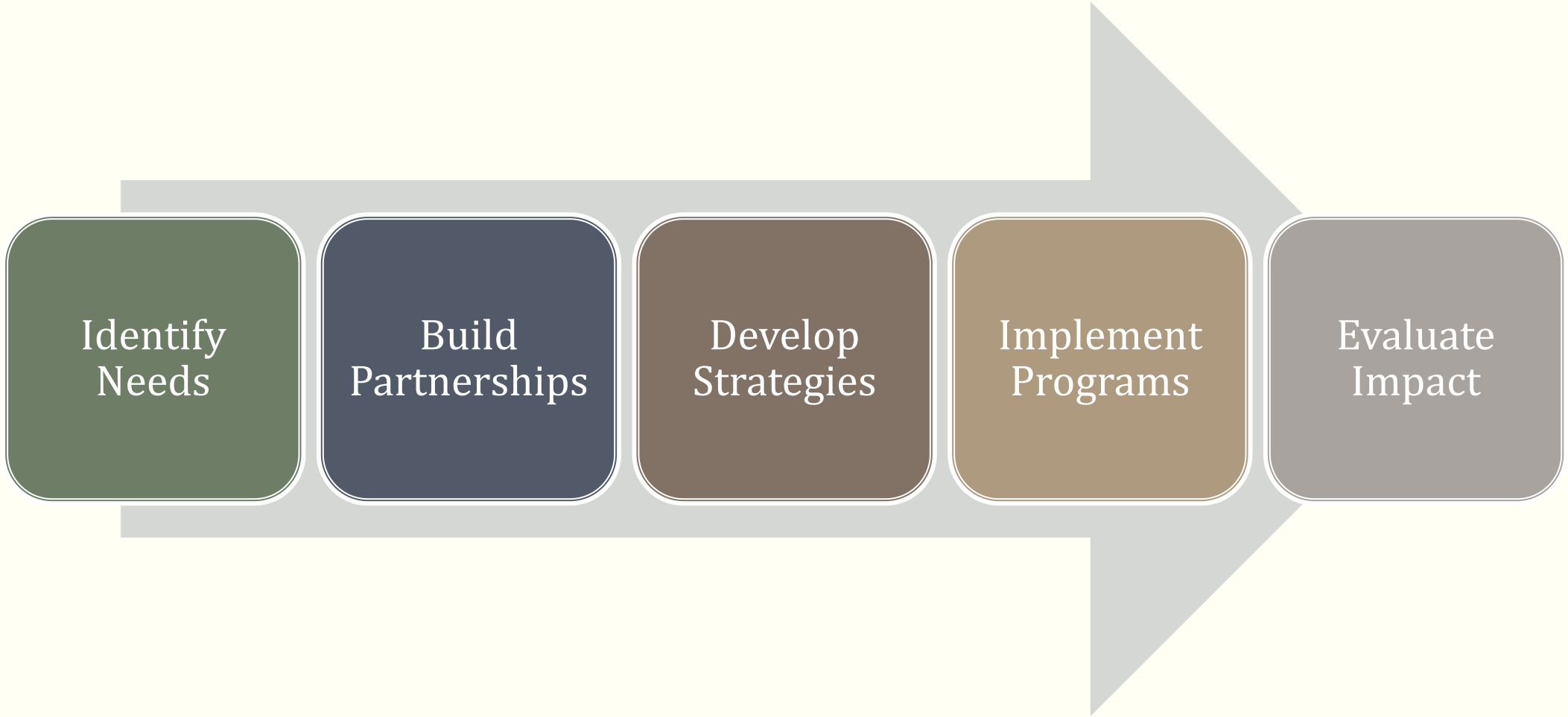
- **Underrepresentation in STEM fields:** Black women face systemic barriers, especially in computer science and engineering.
- **Impact of the Problem:** A lack of diversity prevents innovation and fails to meet the needs of a diverse society.
- **Social Justice:** This problem is not just about equity, it is fundamental about fairness and inclusivity.

Why it Matters: A more diverse STEM workforce fosters creativity, solve complex problems, and ensures that technological advancement benefit everyone.

Proposed Change Process

- **Goal:** Increase interest and persistence of Black women students in STEM, particularly in computer science
- **Key Components of the Change Process:**
  - **Mentorship Programs:** Role models and peer mentors to guide and inspire
  - **Hands-on Experiences:** Opportunities for real-world STEM engagement through projects and activities
  - **Supportive Networks:** Build environments where students feel encouraged and supported
- **Develop Strategies:**
  - Collaborate with schools, universities and local organizations
  - Secure funding for resources and program sustainability
  - Train educator to foster inclusivity and mentorship skills

Proposed Change Process – Flowchart



Scholar Practitioner

- **Role:**
  - **Bridging Research and Practice:** Use research to identify challenges and design evidence-based interventions
  - **Driving Change:** Lead the development and implementation of solutions to address inequities
- **Practitioners required for Change:**
  - **Educators:** Train teachers to promote inclusivity and foster computer science interest
  - **Mentors:** Provide guidance, support, and role models for Black female students
  - **School Administrators:** Advocate for resource allocation and inclusive programs development
  - **Community Leaders:** Build partnerships to increase access to computer science opportunities
  - **Policymakers:** Implement policies that reduce obstacles to STEM participation
  - **Corporate Partners:** Offer internships, sponsorships, and real-world STEM experiences

Why it Matters:

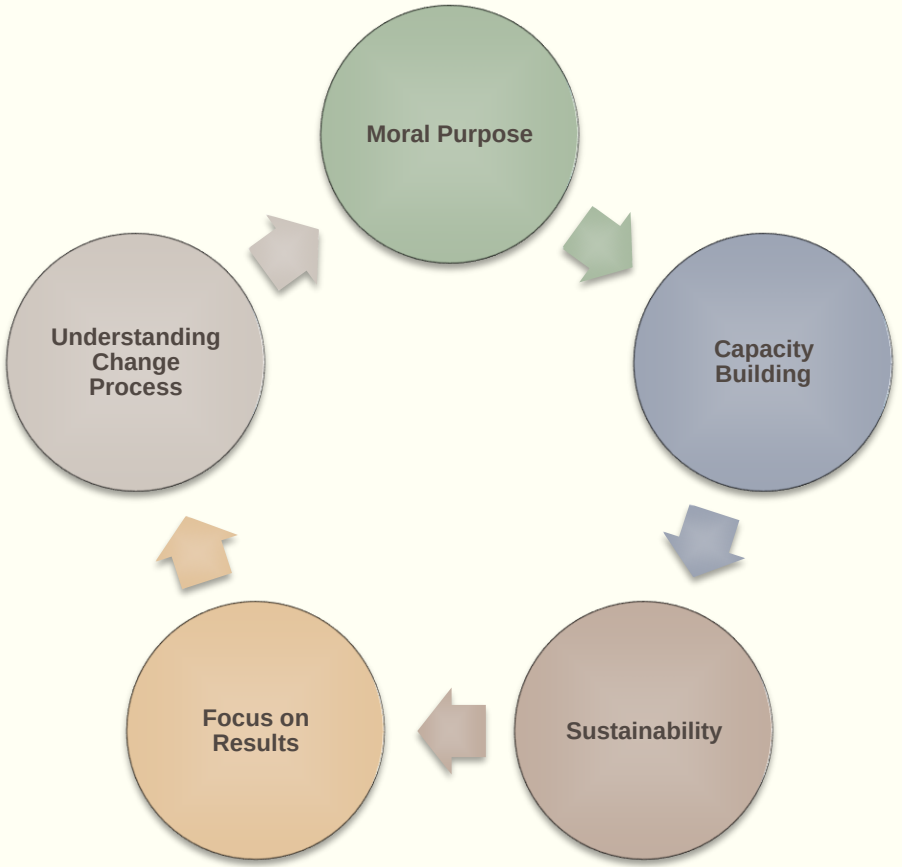
- Increase participation and retention of Black women in STEM fields, particularly in computer science
- Creation of a more diverse, inclusive, and innovative STEM workforce

Leadership Theory

- **Human Resource Leadership:**
  - Leaders are viewed as catalysts and coaches who empower individuals and align organizational goals with human needs. This directly applies to my Problem of Practice, which aims to address the underrepresentation of Black women in STEM, particularly in computer science, through targeted mentorship programs in higher education and P-12 education.
- **Connection to Change Process:**
  - Empowerment: Mentorship programs provide Black female students with role models, resources, and opportunities, enabling them to overcome systemic barriers and develop confidence in STEM disciplines, particularly in computer science.
  - Team Development: By engaging community stakeholders, educators, and industry leaders, the initiative fosters collaboration, creating a supportive network that aligns with institutional goals to promote diversity.
- **Key Insight:**
  - Leaders must prioritize open communication, transparent processes, and a culture of care to ensure mentorship programs are inclusive, effective, and sustainable. This aligns with Gallos and Bolman's principle of empowering individuals while fostering teamwork and alignment within the system.

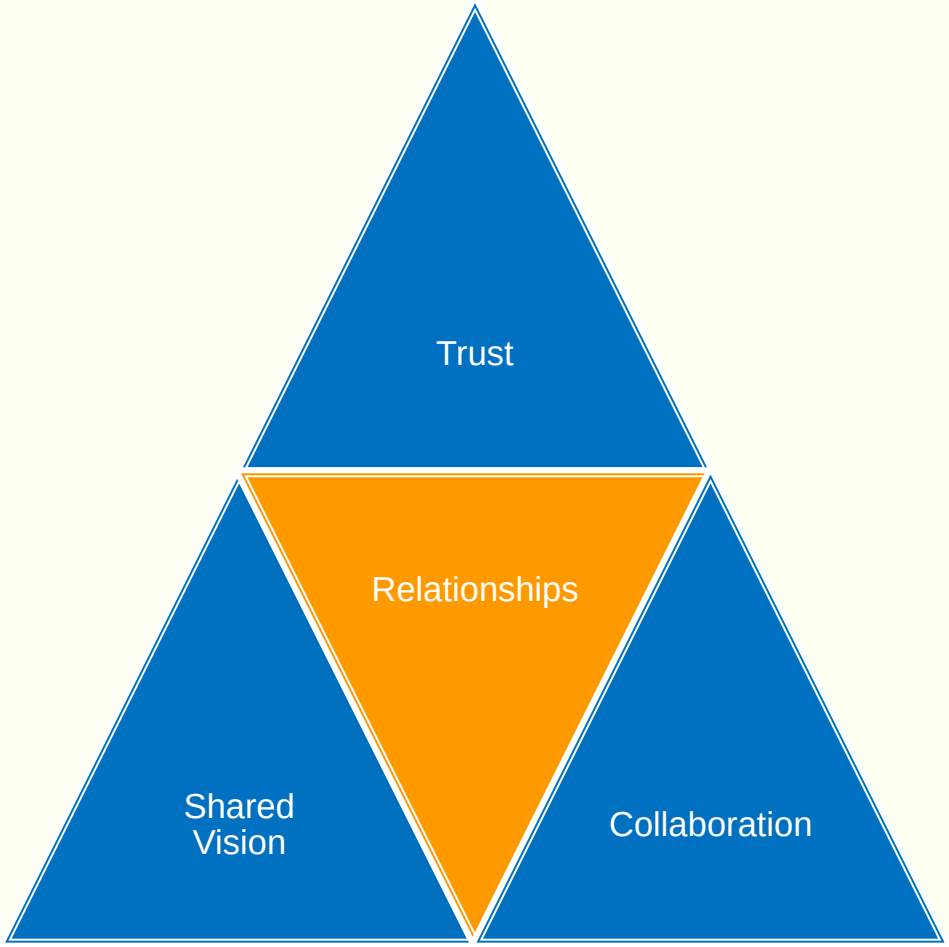
Understanding Change: Fullan's Framework and the Problem of Practice

- **How Fullan's Framework Guides Change in STEM:**
  - Emphasizing equity and social justice
  - Recognizing complexities in addressing inequities
  - Developing skills and resources for solutions
  - Measuring outcomes and progress
  - Ensuring long-term, systemic improvements



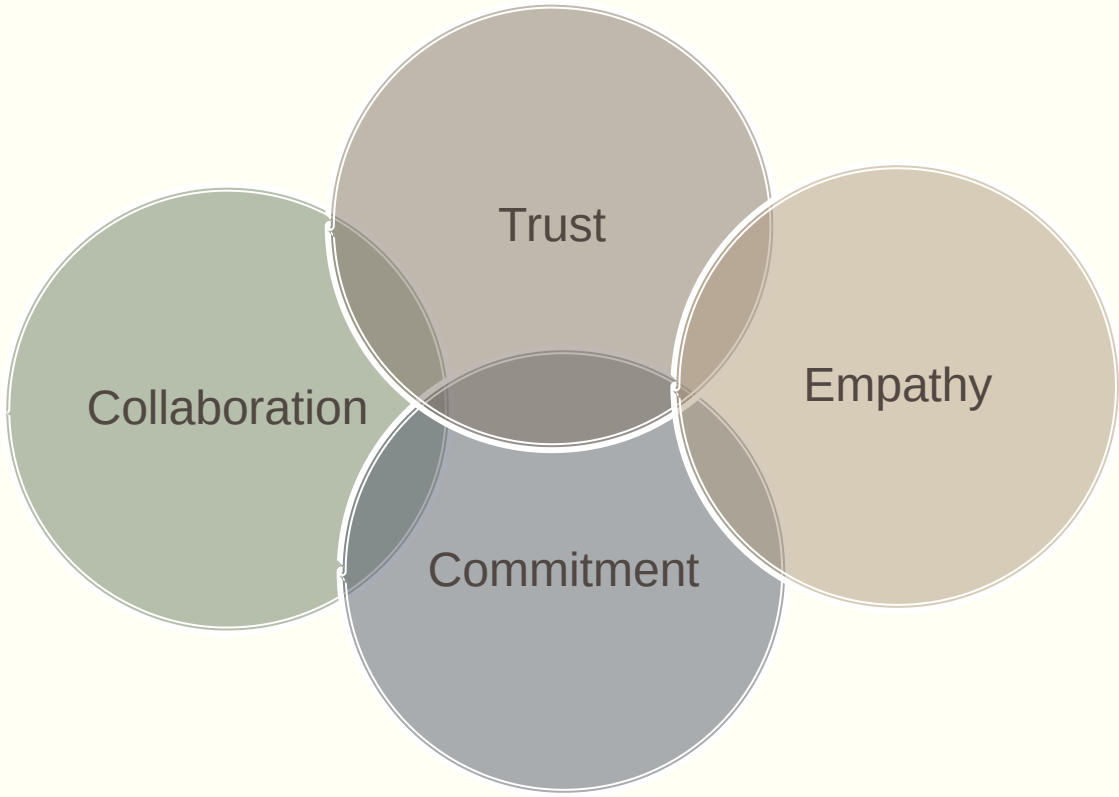
Relationships, Relationships, Relationships: Fullan's Perspective

- **Core Idea:**
  - Relationships are the key to sustainable change
- **Applying to the Problem Of Practice:**
  - Educators connect to support Black women in computer science
  - Mentors guide and inspire future leaders
  - Communitive leaders build supportive environments
  - Policymakers develop inclusive STEM initiatives, particularly in computer science
- **Why Relationships Matter in Change:**
  - Trust foster an open and respectful environment
  - Collaboration allows sharing ideas and resources
  - Shared vision aligns efforts towards common goals



Qualities of Strong Relationships

- **Trust:**
  - The foundation for open and honest communication
  - Builds confidence in shared efforts
- **Empathy:**
  - Understanding the unique challenges faced by Black women in computer science
  - Promotes mutual respect and inclusion
- **Collaboration:**
  - Working together towards shared goals
  - Encourages innovation and problem-solving
- **Commitment:**
  - Shared vision aligns efforts towards common goals



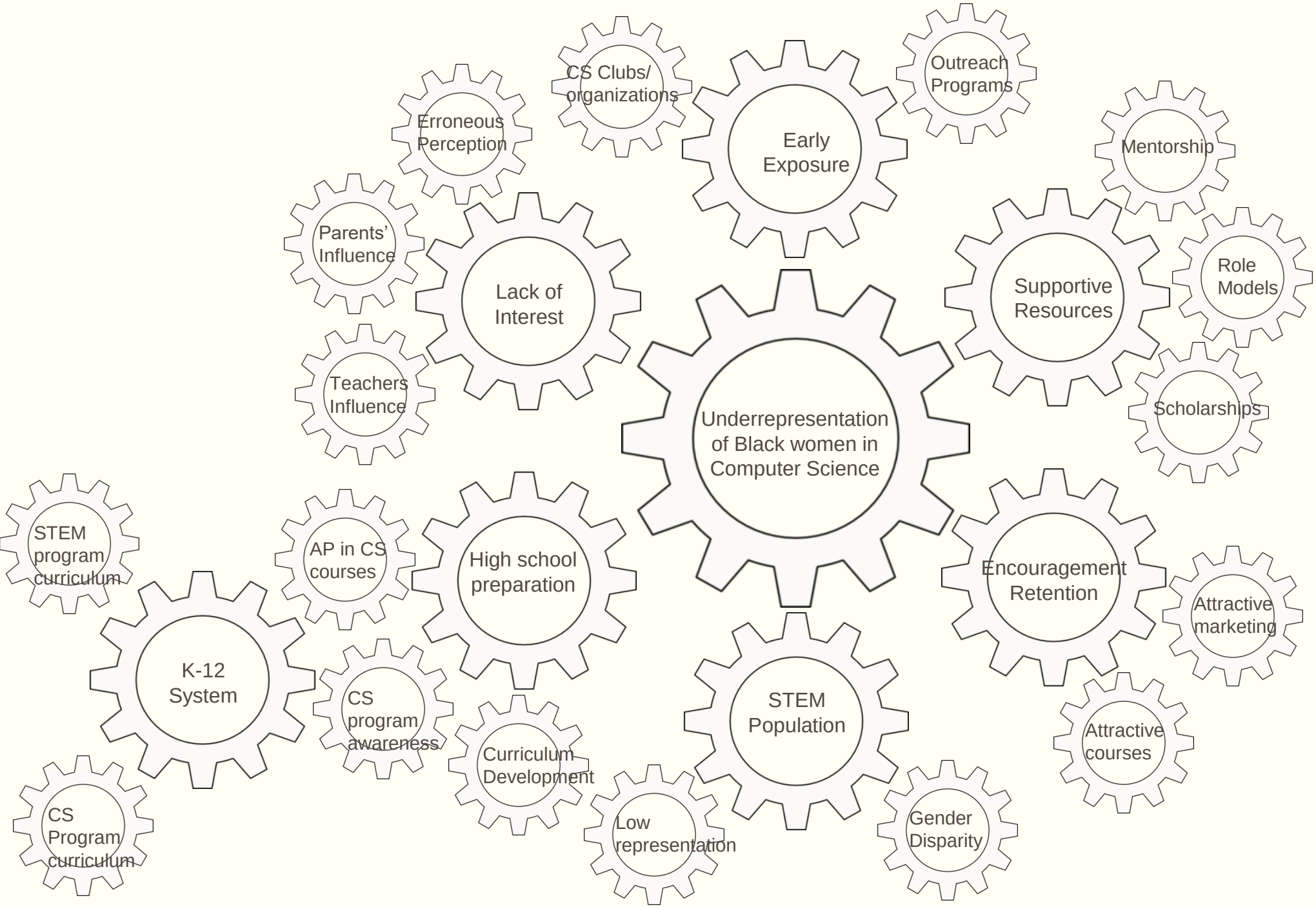
Building Relationships

- **Mentorship Programs:**
  - Establish formal networks to provide guidance and support
- **Diversity and Inclusion Training:**
  - Educate stakeholders on unconscious biases and equitable practices
- **Community Engagement:**
  - Partner with local organizations to create opportunities for Black women in computer science
- **Collaborative Platforms:**
  - Create spaces for educators, policymakers, and industry leaders to connect and act

Why it Matters:

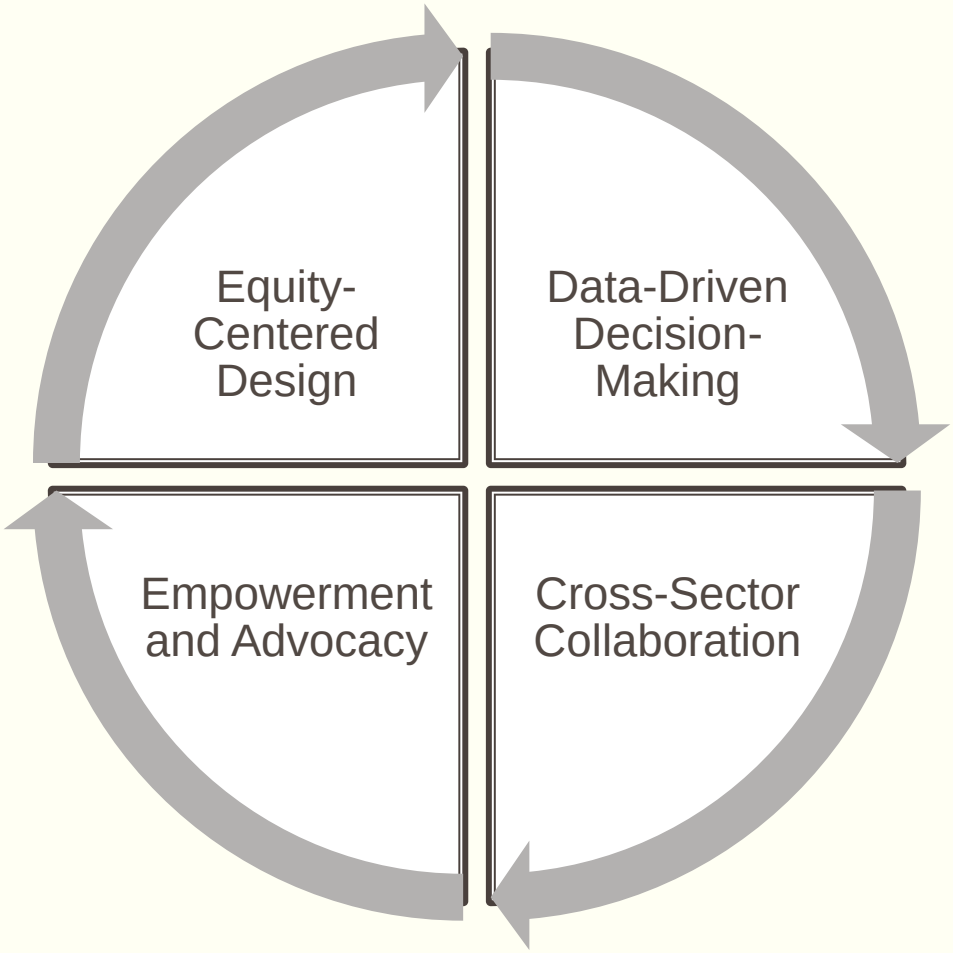
- Creates stronger support networks for Black women in computer science
- Enhanced trust and collaboration among stakeholders
- Increased participation, retention, and success in STEM fields, particularly in computer science

SYSTEMS THINKING:


Underrepresentation of Black women in Computer Science
Lack of Interest
Parents' Influence
Teachers Influence
Erroneous Perception
CS Clubs/ organizations
Early Exposure
Outreach Programs
Supportive Resources
Mentorship
Role Models
Scholarships
High school preparation
AP in CS courses
STEM program curriculum
K-12 System
CS program awareness
CS Program curriculum
Curriculum Development
STEM Population
Low representation
Encouragement Retention
Attractive marketing
Attractive courses
Gender Disparity

Systems Thinking Accelerators for Addressing the Problem of Practice

- **Equity-Centered Design:**
  - Develop STEM programs that prioritize inclusivity
  - Co-design solutions with stakeholders, including Black women in computer science
- **Data-Driven Decision-Making:**
  - Collect and analyze data to identify barriers and measure progress
  - Use insights to refine strategies and policies
- **Cross-Sector Collaboration:**
  - Foster partnerships between educators, policymakers, industries and community organizations
  - Unified effort in addressing inequalities
- **Empowerment and Advocacy:**
  - Train mentors to support Black women in computer science
  - Advocate for systemic policy changes to promote diversity and inclusion
- **Feedback and Iteration:**
  - Continuously gather feedback from participants and stakeholders
  - Refine initiatives through iterative improvement cycles



Reframing Academic Leadership to Address the Problem of Practice: Bolman and Gallos' perspective

- **Core Idea:**
  - Bolman and Gallos emphasize four leadership frames to tackle complex academic challenges
- **Structural Frame:**
  - Roles, policies and processes
  - Application:
    - redesign STEM programs for inclusivity and equity
    - Establish clear pathways for Black women in computer science
- **Human Resource Frame:**
  - People, relationships, and personal growth
  - Application:
    - Build supportive mentorship and sponsorship networks
    - Create professional development opportunities for Black women in computer science
- **Political Frame:**
  - Power, dynamics, competition and coalition building
  - Application:
    - Advocate for resources to support diversity
    - Build alliances across stakeholders to promote systemic change
- **Symbolic Frame:**
  - Culture, values, and inspiration
  - Application:
    - Celebrates achievements of Black women in STEM
    - Foster culture of belonging and shared purpose

Why it matters:

- To address systemic barriers with all-inclusive and adaptable strategies
- To encourage collaboration, equity, and innovation in STEM, particularly in computer science

References

Fullan, M. (2001). *Leading in a Culture of Change*. Jossey-Bass.

Gallos, J. V., & Bolman, L. G. (2021). *Reframing Academic Leadership* (Second ed.). Jossey-Bass.