Articulating the Components of Inclusive STEM High Schools

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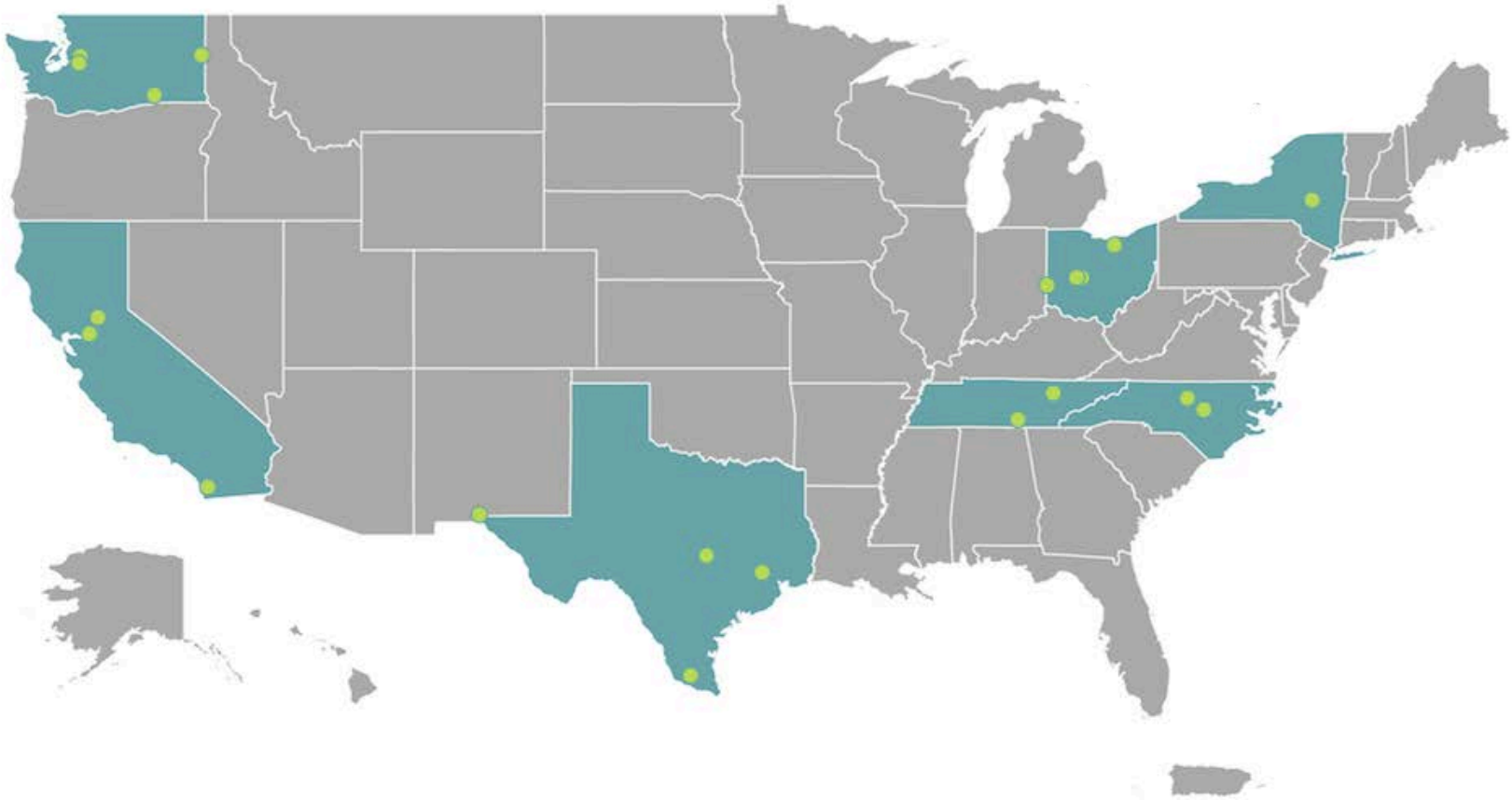
RESEARCH & EVALUATION
CEMSE | UNIVERSITY OF CHICAGO

S3 STEM SCHOOL STUDY


What is an inclusive STEM High School?
S3
STEM SCHOOL STUDY

Participating Schools



STEM SCHOOL STUDY

How do STEM schools define themselves?

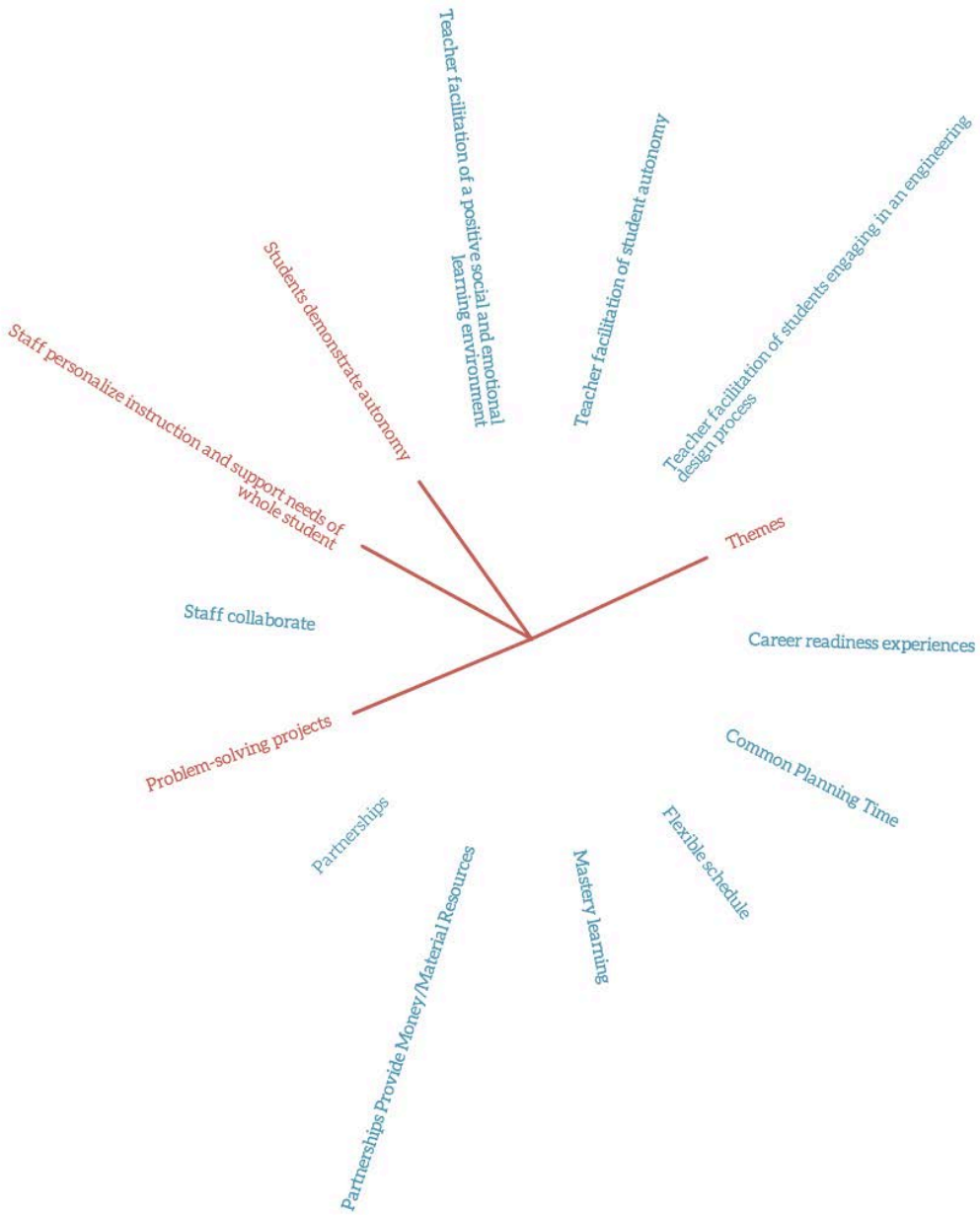
What are these schools actually doing?

What does it all mean for students?


How do STEM High Schools define themselves?

Kennedy School: Essential Components

Red = Core Components



Advisory · Career Readiness Experiences· Code of Behavior and Values· Collaborative Governance Structure· Common Planning Time· Community Learning Center · Core Course Sequence· Depth Over Breadth· Early College· Family Involvement· Flexible Schedule · Higher Education Exposure· Individual Planning Time· Interdisciplinary Teams· Intersession· Mastery learning· Non-Instructional Staff· Non-Selective Enrollment· Online Management System· Open Physical Space· Partnerships· Platform or Demonstration School Identity· Problem-Solving Projects· Range of Student Assessments· Range of Student Outcomes· Regional School· Representative Population· School Space to Facilitate Public Engagement· Service Learning· Social-Emotional Learning Curriculum· Standards· STEM Instructional Leaders· STEM Space· Student Access to School Across the Day· Student Induction Process· Student-Led Demonstration of Learning· Summer Homework· Technology Presence· Tutoring· Year-Round School· Online Training Resource · Professional Development Activities· Professional Development Resources· Special Space for Professional Development· Staff are Flexible and Open to Change· Staff Believe all students can learn *(Disposition)*· Staff Collaborate· Staff Consider Depth Over Breadth *(Disposition)*· Staff Emphasize Code of Behavior and Values · Staff Establish and Maintain Partnerships· Staff Have a Sense of School Ownership *(Disposition)*· Staff Participate in Decision Making· Staff Reflect on their Work· Staff Spread Practices· Staff Support Needs of Whole Student· Staff Treat One Another with Trust and Respect· Staff Use an Engineering Design Process to Frame School Development and Improvement· Staff Work with Autonomy· School Leaders Facilitate Staff Growth and Development· School Leaders Model Instructional Practice for Others at the School· School Leaders are 'Transformational"· School Leaders Model Risk-Taking for Staff· Teacher Leaders Facilitate Communication Across Campuses· Students Contribute to School Decision-Making· Students Demonstrate Code of Behavior and Values· Students do Summer Homework· Students Participate in Early College Activities· Students Participate in Extracurricular Activities· Students Participate in Higher Education Exposure Activities· Students Participate in Tutoring· Students Treat One Another with Trust and Respect· Students use Community Learning Center · Students Work With and Use Technology Appropriately· Families Monitor Student Activity and Grades· Partners Facilitate Spread of Practices· Partners Help Establish and Maintain Community Presence· Partners Support Instruction· Partnerships Provide Money/Material Resources· Teacher Differentiation of Instruction Based on Learning Needs· Teacher Differentiation of Instruction Based on Students' Social and Emotional Needs· Teacher Facilitation of a Positive Social and Emotional Learning Environment· Teacher Facilitation of Student Autonomy· Teacher Facilitation of Student Engagement in Problem-Solving Projects· Teacher Facilitation of Student Interest· Teacher Facilitation of Student Self-Reflection· Teacher Facilitation of Students Doing Cognitively Demanding Work· · Teacher Facilitation of Students Engaging in an Engineering Design Process· Teacher Facilitation of Students Engaging with "Real-World" Content· Teacher Facilitation of Students Learning Skills Specifically Related to the Work Place· Teacher Facilitation of Students Recognizing Connections Across Disciplines· Teacher Facilitation of Teamwork and Collaboration Among Students· Teacher Models Use of New and Current Technologies· Teacher Use of Assessment to Inform Instruction· Students Cooperate and Work with One Another as Teams· Students Demonstrate and Follow Code of Behavior and Values· Students Demonstrate Autonomy· Students Engage and Participate in Career Readiness · Students Engage and Participate in Problem-Solving Projects· Students Engage and Participate in Service Learning · Students Engage in Cognitively Demanding Work· Students Make Connections Between the Content They are Learning, the Real World, and Their Lives· Students Participate in Demonstrations of Learning· Students Recognize Connections Across the Disciplines· Students Reflect on Their Learning· Students Take Risks· Students Use Work Place Skills· Teacher Differentiation of Instruction Based on Learning Needs· Teacher Differentiation of Instruction Based on Students' Social and Emotional Needs· Teacher Facilitation of a Positive Social and Emotional Learning Environment· Teacher Facilitation of Student Autonomy· Teacher Facilitation of Student Engagement in Problem-Solving Projects· Teacher Facilitation of Student Interest· Teacher Facilitation of Student Self-Reflection· Teacher Facilitation of Students Doing Cognitively Demanding Work· · Teacher Facilitation of Students Engaging in an Engineering Design Process· Teacher Facilitation of Students Engaging with "Real-World" Content· Teacher Facilitation of 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Experience · Code of Behavior and Values · Collaborative Governance Structure

The "We have that too!" Phenomenon

Average Number of Essential Components Identified for a School in the Ohio study:

80

Projects → Understanding STEM Schools → Data Visualizations → Critical Components Infographic

Explore STEM School Critical Components

UPON ARRIVAL TO THIS PAGE, ALL SCHOOLS ARE SELECTED. THE MOST COMMON CRITICAL COMPONENTS ARE THE DARKEST AND THE LEAST COMMON ARE THE LIGHTEST.

EXPLORE SCHOOLS
TO SEE WHICH CRITICAL COMPONENTS ARE THE MOST COMMON AMONG THE SCHOOLS BELOW, SELECT ONE OR MORE SCHOOL NAMES.

TO LEARN MORE ABOUT A SCHOOL, CLICK THE ⓘ

EXPLORE CRITICAL COMPONENTS
TO SEE WHICH SCHOOLS HAVE A PARTICULAR CRITICAL COMPONENT, SELECT A CRITICAL COMPONENT.

TO SEE A CRITICAL COMPONENT'S DEFINITION, CLICK THE ⓘ

Watch a video introduction to the Infographic

SELECT ALL SCHOOLS CLEAR SELECTION

- CREST (The Center for Research in Engineering, Science and Technology) at Paradise Valley High School
- Dayton Regional STEM School
- Delta High School
- Downingtown STEM Academy
- Hughes STEM High School
- MC2 STEM High School
- METSA (Math, Engineering, Technology and Science Academy at R.L. Turner High School)
- Metro Early College High School
- National Inventor's Hall of Fame School
- North Carolina School of Science and Mathematics
- Richardson Berkner STEM Academy
- Rochester STEM High School
- Stratford STEM Magnet High School
- Tech Valley High School
- Thomas Jefferson High School for Science and Technology
- Wake North Carolina State University STEM Early College High School

ADD YOUR SCHOOL

SCHOOL STRUCTURES	Advisory	Application Process	Career Readiness Experiences
	Common Planning Time	Core Course Sequence	Depth Over Breadth
	Flexible Schedule	Higher Education Exposure	Individual Planning Time
EDUCATIVE SUPPORTS	Mastery learning	Non-Instructional Staff	Non-Selective Enrollment
	Partnerships	Platform or Demonstration School Identity	Problem-Solving Projects
	Regional School	Representative Population	Residential Campus
STAFF INTERACTIONS	School Space to Facilitate Public Engagement	Selective Enrollment	Service-Learning
	Student Access to School Across the Day	Student Induction Process	Student-Led Demonstration of Learning
SCHOOL LEADER	Online Training Resources	Professional Development Resources	Scheduled Professional Development
	Staff Are Flexible and Open to Change	Staff Believe All Students Can Learn	Staff Collaborate

ONS	Student Access to School Across the Day	Student Induction Process	Student-Led Demonstration of Learning	Technology Presence	Tutoring
SCHOOL LEADER INTERACTIONS	Online Training Resources	Professional Development Resources	Scheduled Professional Development	Special Space for Professional Development	
	Staff Are Flexible and Open to Change	Staff Believe All Students Can Learn (Disposition)	Staff Collaborate	Staff Consider Depth Over Breadth	Staff Embrace an Engineering Design Process
	Staff Emphasize Code of Behavior and Values	Staff Establish and Maintain Partnerships	Staff Have a Sense of School Ownership	Staff Participate in Decision Making	Staff Reflect on Work
	Staff Spread Practices	Staff Support Needs of Whole Student	Staff Treat One Another with Trust and Respect	Staff Work with Autonomy	
STUDENT INTERACTIONS	School Leader Facilitates Staff Growth and Development	School Leader Models Instructional Practice	School Leader Models Risk-taking	School Leaders are "Transformational"	Teacher Leaders Facilitate Communication Across Campuses
	Students Contribute to School Decision-Making	Students Demonstrate Code of Behavior and Values	Students Participate in Early College Activities	Students Participate in Extracurricular Activities	Students Participate in Higher Education Exposure Activities
	Students Treat One Another with Trust and Respect	Students Work With and Use Technology Appropriately			
PARTNER INTERACTIONS	Families Monitor Student Activity and Grades	Partners Facilitate Spread of Practices	Partners Help Establish and Maintain Community Presence	Partners Provide Money/Material Resources	Partners Support Instruction
TEACHER ENGAGEMENT	Teacher Differentiation for Learning Needs	Teacher Differentiation for Social and Emotional Needs	Teacher Facilitation of Cognitive Demand	Teacher Facilitation of Engagement with "Real-World" Content	Teacher Facilitation of Engineering Design Process for Students
	Teacher Facilitation of Participation in Problem-Solving Projects	Teacher Facilitation of Recognition of Inter-disciplinary Connections	Teacher Facilitation of Student Autonomy	Teacher Facilitation of Student Interest	Teacher Facilitation of Student Reflection
	Teacher Facilitation of Student Teamwork and Collaboration	Teacher Facilitation of Students Learning Skills Specifically Related to the Work Place	Teacher Facilitation of a Positive Social and Emotional Learning Climate	Teacher Models Use of New and Emerging Technology	Teacher Use of Assessment to Inform Instruction
STUDENT ENGAG	Students Cooperate and Work with One Another as Teams	Students Demonstrate Autonomy	Students Demonstrate Code of Behavior and Values	Students Do Summer Homework	Students Engage in Career Readiness
	Students Engage in Cognitively Demanding Work	Students Engage in Problem-Solving Projects	Students Engage in Service-Learning	Students Engage in Understanding of Work Place Skills	Students Make Connections Between the Disciplinary Content and the Real World
	Students Participate in Demonstrations of Learning	Students Participate in Tutoring	Students Recognize Connections Across the Disciplines	Students Reflect on Their Learning	Students Take Risks

Revised Strategy

Identify true personalities of schools

Move toward a more measurable framework

The Model Articulation Process, Phase I

Explore

Interview

Code

Synthesize

Revise

STEM SCHOOL STUDY

Revised Strategy

Average Number of Essential Components Identified for a School in the Ohio study:

80

Average Number of Essential Components Identified for a School in the S3 study:

27

Kennedy School: Essential Components

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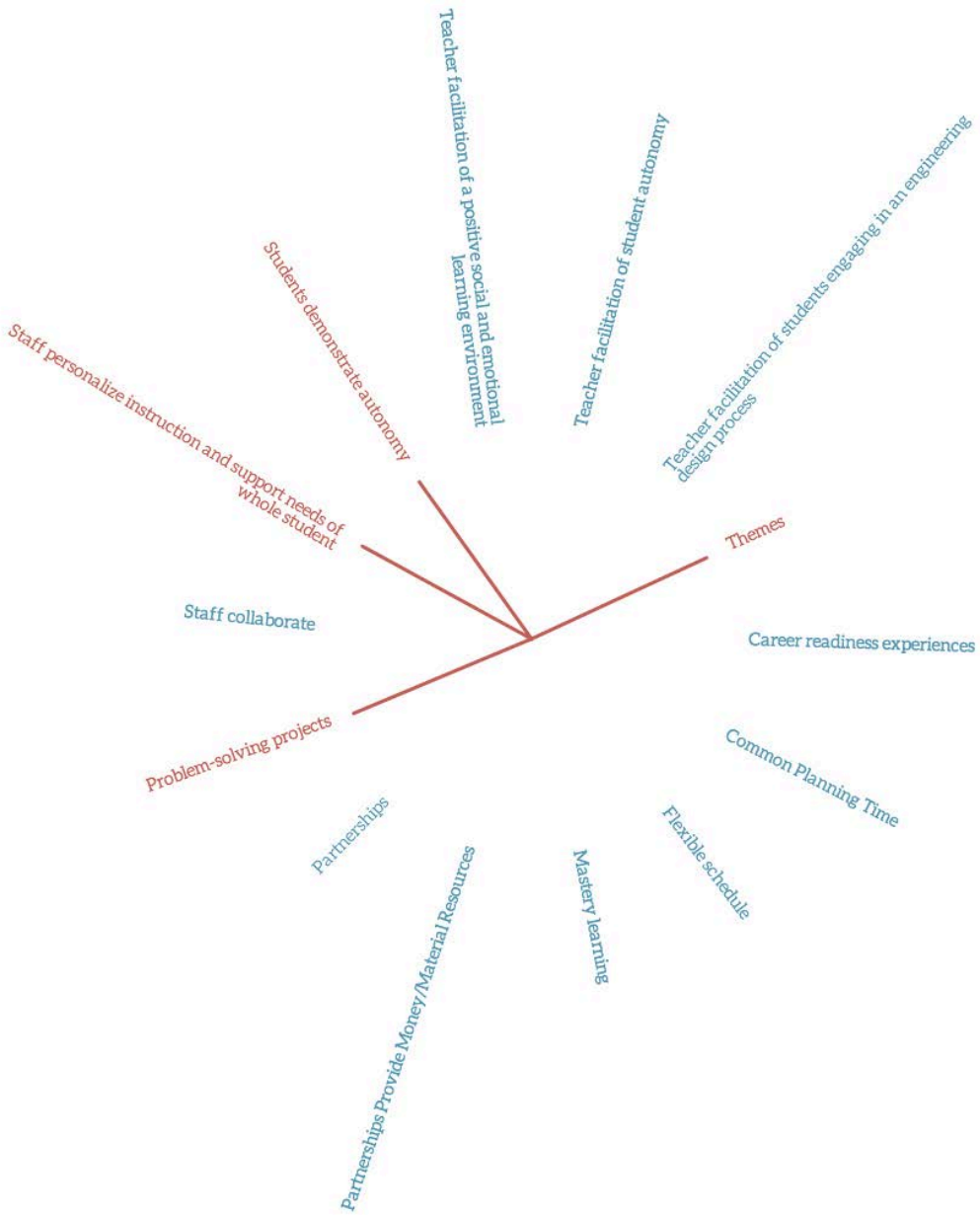

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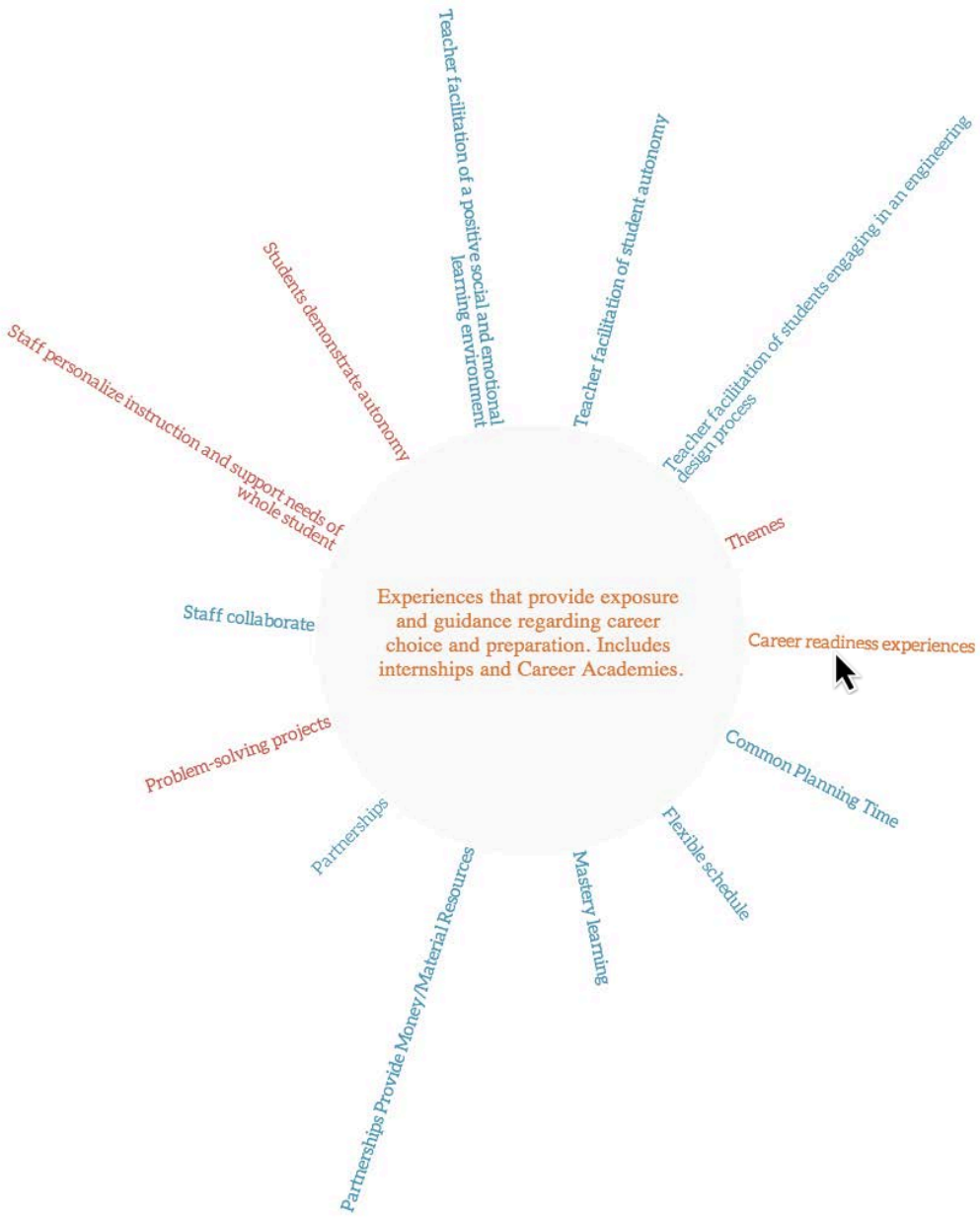
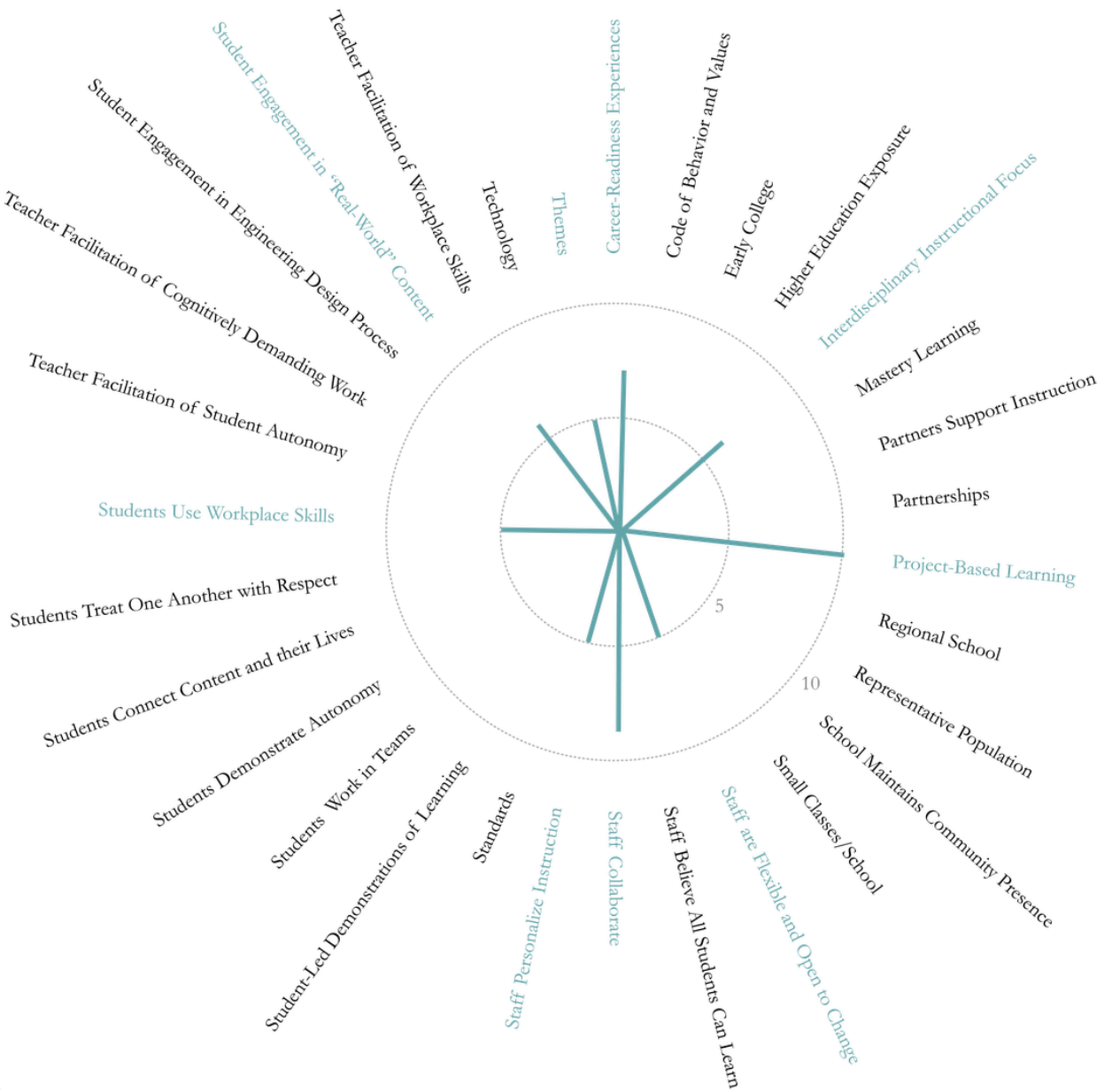


Frequency of Core Components Across Schools



Conceptual Revisions

Next Steps

How do STEM schools define themselves?

What are these schools actually doing?

What does it all mean for students?

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RESEARCH & EVALUATION
CEMSE | UNIVERSITY OF CHICAGO

Melanie LaForce, PhD

S3 Co-PI, laforce@uchicago.edu

Liz Bancroft, MA

S3 Associate Project Director, ebancroft@uchicago.edu

http://cemse.uchicago.edu/research-and-evaluation/research/cemses3/

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