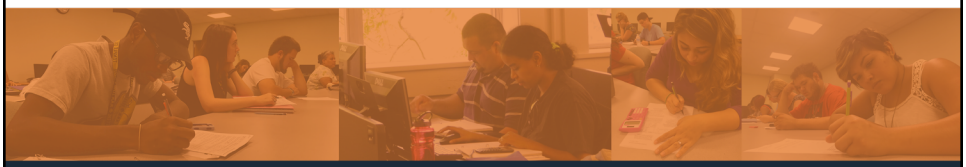
The University of Texas at Austin
Charles A. Dana Center

Harness the Waves of Change with Innovation Configuration Maps

Mary Davis and Denise Thornton

NCSM Annual Conference, San Diego, CA

April 2, 2019



The University of Texas at Austin
Charles A. Dana Center

What do you think?

Image credit: Rawpixel/iStockphoto

Imagine you just walked into a classroom.

How do you know what students are thinking?

What actions would you observe?

The University of Texas at Austin
Charles A. Dana Center

Lights! Camera! Action!

Today's Facilitators

Mary Davis
Professional Learning Facilitator
K–12 Services, Math
Charles A. Dana Center
marydavis@austin.utexas.edu
@Mary_Davis_UTDC

Denise Thornton
Professional Learning Facilitator
K–12 Services, Math
Charles A. Dana Center
denisethornton@austin.utexas.edu
@UTDCDenise

About the Dana Center

Equity — Access — Excellence

Dana Center by the Numbers

We provided professional development for **Department of Defense Education Activity teachers**, benefiting 88,500 students in 14 countries.

The University of Texas at Austin Charles A. Dana Center 5

Dana Center by the Numbers

Nearly 1,000 Louisiana teacher-leaders and mentors received **capacity-building support** from our professional learning facilitators.

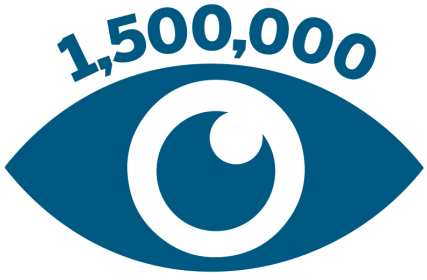
The University of Texas at Austin Charles A. Dana Center 6

Dana Center by the Numbers

Downloads of free resources for elementary and secondary classrooms from **Inside Mathematics**.

The University of Texas at Austin Charles A. Dana Center 7

Dana Center by the Numbers



People who viewed MathCuts–**quick, engaging strategies** for K–6 classroom teachers–on Facebook.

The University of Texas at Austin Charles A. Dana Center 8

Learning Objectives

Explore NCTM's *Principles to Actions* Mathematics Teaching Practices.

Examine Innovation Configuration maps.

Complete a Virtual Classroom walk-through using www.insidemathematics.org.

The University of Texas at Austin
Charles A. Dana Center

9

What do you think?

Image credit: Rawpixel/iStockphoto

Imagine you just walked into a classroom.

How do you know what students are thinking?

What actions would you observe?

The University of Texas at Austin
Charles A. Dana Center

10

Effective Teaching and Learning

An excellent mathematics program requires effective teaching that engages students in meaningful learning through individual and collaborative experiences that promote their ability to make sense of mathematical ideas and reason mathematically.

— Page 7 in National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all.* Available via http://www.nctm.org/PtA

The University of Texas at Austin Charles A. Dana Center 11

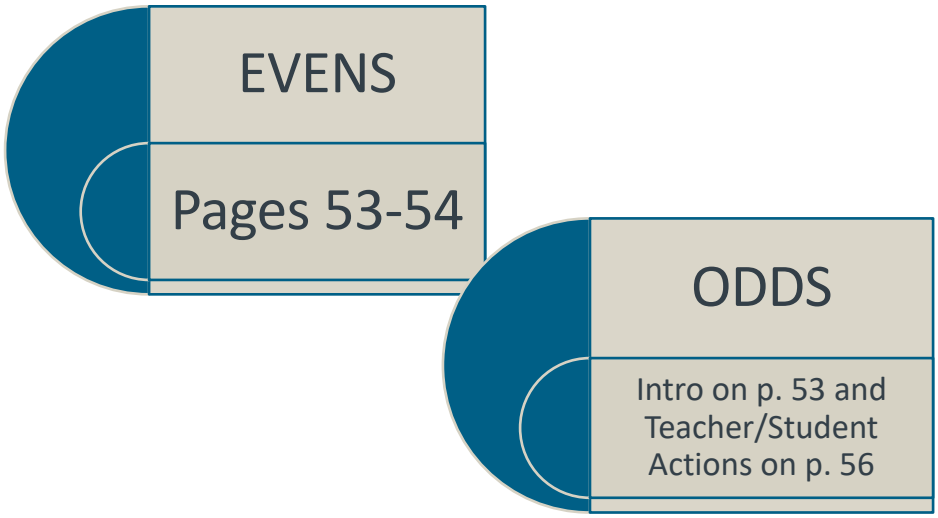
Effective Mathematics Teaching Practices

- Establish mathematics **goals** to focus learning.
- Implement tasks that promote reasoning and problem solving.
- Use and connect mathematical representations.
- Facilitate meaningful mathematical discourse.
- Pose purposeful questions.
- Build procedural fluency from conceptual understanding.
- Support productive struggle in learning mathematics.
- Elicit and use evidence of student thinking.

— Page 9 in National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all.* Available via http://www.nctm.org/PtA

The University of Texas at Austin Charles A. Dana Center 12

Look at MTP 8: Elicit and Use Evidence of Student Thinking



The University of Texas at Austin Charles A. Dana Center 13

Mathematics Teaching Practices - Jigsaw

- Independently read your assigned pages.
- Discuss with your colleagues what seems critical about that practice.
- Be prepared to share your findings with the other group and to learn from the other group.

These teaching practices represent the kind of instruction that supports greater student achievement.

The University of Texas at Austin Charles A. Dana Center 14

Elicit and Use Evidence of Student Thinking

Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

— Page 53 in National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all*. Available via http://www.nctm.org/PtA

The University of Texas at Austin Charles A. Dana Center

15

Innovation Configuration

Change…

- …is a PROCESS, not an event.
- …is accomplished by INDIVIDUALS first, then systems.
- …is a highly PERSONAL experience.
- …requires GROWTH in feelings and skills.

Individuals implement change in different configurations – or operational forms.

Hall, G. E., & Hord, S. M. (2015). *Implementing change: Patterns, principles, and potholes*. Boston, MA: Pearson/Allyn & Bacon.

The University of Texas at Austin Charles A. Dana Center

16

Innovation Configuration Maps

An IC map presents carefully developed word-pictures of selected components of an innovation, or change, and the different operational forms that may exist.

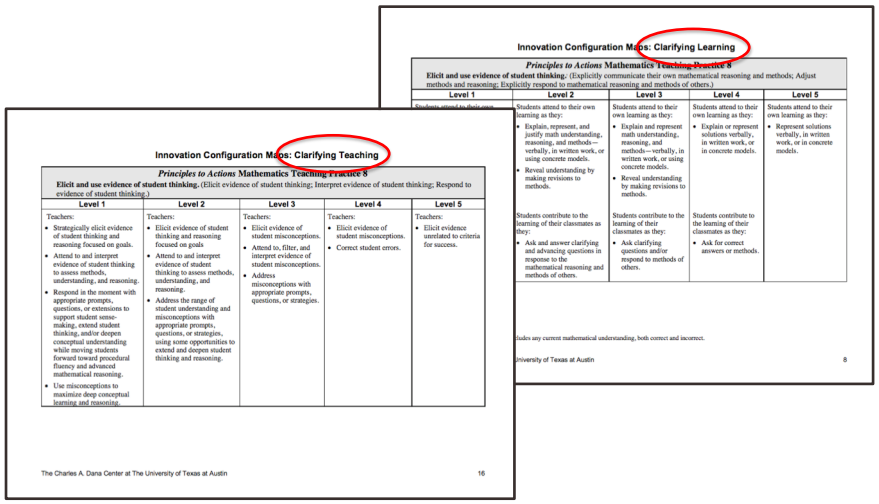
IC maps are for shared learning.

Hall, G. E., & Hord, S. M. (2015). *Implementing change: Patterns, principles, and potholes.* Boston, MA: Pearson/Allyn & Bacon.

Innovation Configuration Maps

Level 1	Level 2	Level 3	Level 4
			

Innovation Configuration Maps



Innovation Configuration Maps: Clarifying Teaching

Principles to Actions Mathematics Teaching Practice 8

Elicit and use evidence of student thinking. (Elicit evidence of student thinking; Interpret evidence of student thinking; Respond to evidence of student thinking.)

Level 1	Level 2	Level 3	Level 4	Level 5
Teachers: • Strategically elicit evidence of student thinking and reasoning focused on goals. • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Respond in the moment with appropriate prompts, questions, or extensions to support student sense-making, extend student thinking, and/or deepen conceptual understanding while moving students forward toward procedural fluency and advanced mathematical reasoning. • Use misconceptions to maximize deep conceptual learning and reasoning.	Teachers: • Elicit evidence of student thinking and reasoning focused on goals • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Address the range of student understanding and misconceptions with appropriate prompts, questions, or strategies, using some opportunities to extend and deepen student thinking and reasoning.	Teachers: • Elicit evidence of student misconceptions. • Attend to, filter, and interpret evidence of student misconceptions. • Address misconceptions with appropriate prompts, questions, or strategies.	Teachers: • Elicit evidence of student misconceptions. • Correct student errors.	Teachers: • Elicit evidence unrelated to criteria for success.

The Charles A. Dana Center at The University of Texas at Austin 16

Innovation Configuration Maps: Clarifying Learning

Principles to Actions Mathematics Teaching Practice 8

Elicit and use evidence of student thinking. (Explicitly communicate their own mathematical reasoning and methods; Adjust methods and reasoning; Explicitly respond to mathematical reasoning and methods of others.)

Level 1	Level 2	Level 3	Level 4	Level 5
Students attend to their own	Students attend to their own learning as they: • Explain, represent, and justify math understanding, reasoning, and methods—verbally, in written work, or using concrete models. • Reveal understanding by making revisions to methods. Students contribute to the learning of their classmates as they: • Ask and answer clarifying and advancing questions in response to the mathematical reasoning and methods of others.	Students attend to their own learning as they: • Explain and represent math understanding, reasoning, and methods—verbally, in written work, or using concrete models. • Reveal understanding by making revisions to methods. Students contribute to the learning of their classmates as they: • Ask clarifying questions and/or respond to methods of others.	Students attend to their own learning as they: • Explain or represent solutions verbally, in written work, or in concrete models. Students contribute to the learning of their classmates as they: • Ask for correct answers or methods.	Students attend to their own learning as they: • Represent solutions verbally, in written work, or in concrete models.

tudes any current mathematical understanding, both correct and incorrect.

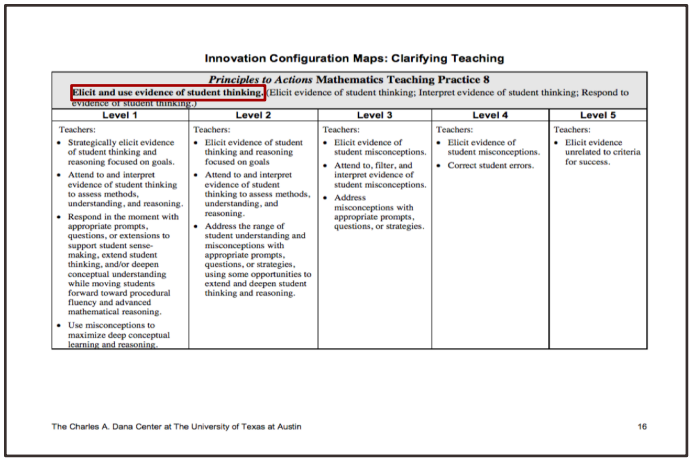
University of Texas at Austin 8

The University of Texas at Austin
Charles A. Dana Center

19

Innovation Configuration Maps

Elements of Innovation Configuration Maps: Components



Innovation Configuration Maps: Clarifying Teaching

Principles to Actions Mathematics Teaching Practice 8

Elicit and use evidence of student thinking. (Elicit evidence of student thinking; Interpret evidence of student thinking; Respond to evidence of student thinking.)

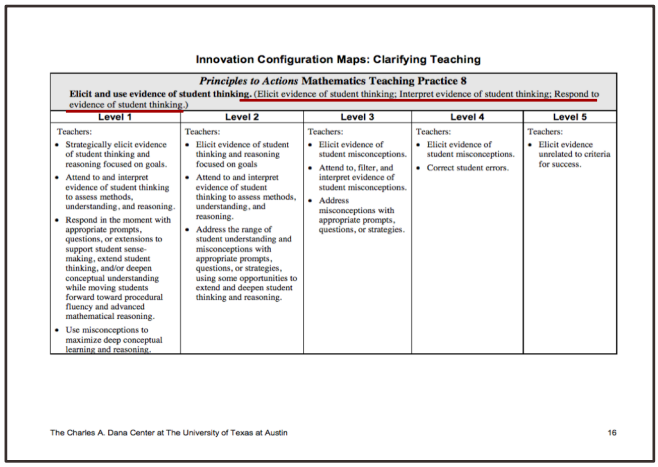
Level 1	Level 2	Level 3	Level 4	Level 5
Teachers: • Strategically elicit evidence of student thinking and reasoning focused on goals. • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Respond in the moment with appropriate prompts, questions, or extensions to support student sense-making, extend student thinking, and/or deepen conceptual understanding while moving students forward toward procedural fluency and advanced mathematical reasoning. • Use misconceptions to maximize deep conceptual learning and reasoning.	Teachers: • Elicit evidence of student thinking and reasoning focused on goals • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Address the range of student understanding and misconceptions with appropriate prompts, questions, or strategies, using some opportunities to extend and deepen student thinking and reasoning.	Teachers: • Elicit evidence of student misconceptions. • Attend to, filter, and interpret evidence of student misconceptions. • Address misconceptions with appropriate prompts, questions, or strategies.	Teachers: • Elicit evidence of student misconceptions. • Correct student errors.	Teachers: • Elicit evidence unrelated to criteria for success.

The Charles A. Dana Center at The University of Texas at Austin 16

The University of Texas at Austin
Charles A. Dana Center

Innovation Configuration Maps

Elements of Innovation Configuration Maps: Dimensions



Innovation Configuration Maps: Clarifying Teaching

***Principles to Actions* Mathematics Teaching Practice 8**

Elicit and use evidence of student thinking. (Elicit evidence of student thinking; Interpret evidence of student thinking; Respond to evidence of student thinking.)

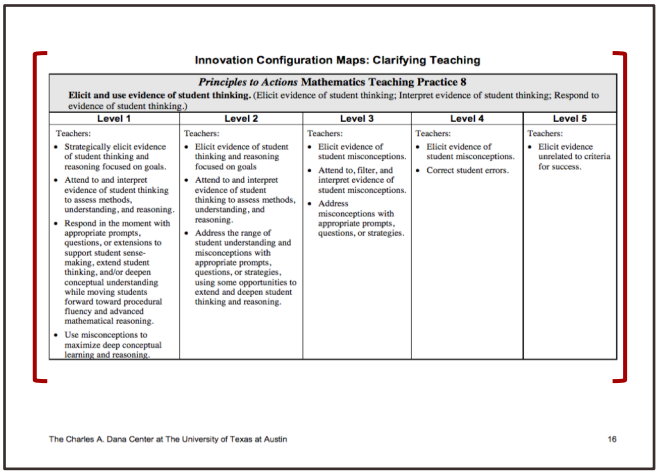
Level 1	Level 2	Level 3	Level 4	Level 5
Teachers: • Strategically elicit evidence of student thinking and reasoning focused on goals. • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Respond in the moment with appropriate prompts, questions, or extensions to support student sense-making, extend student thinking, and/or deepen conceptual understanding while moving students forward toward procedural fluency and advanced mathematical reasoning. • Use misconceptions to maximize deep conceptual learning and reasoning.	Teachers: • Elicit evidence of student thinking and reasoning focused on goals • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Address the range of student understanding and misconceptions with appropriate prompts, questions, or strategies, using some opportunities to extend and deepen student thinking and reasoning.	Teachers: • Elicit evidence of student misconceptions. • Attend to, filter, and interpret evidence of student misconceptions. • Address misconceptions with appropriate prompts, questions, or strategies.	Teachers: • Elicit evidence of student misconceptions. • Correct student errors.	Teachers: • Elicit evidence unrelated to criteria for success.

The Charles A. Dana Center at The University of Texas at Austin 16

The University of Texas at Austin
Charles A. Dana Center

Innovation Configuration Maps

Elements of Innovation Configuration Maps: Variations



Innovation Configuration Maps: Clarifying Teaching

***Principles to Actions* Mathematics Teaching Practice 8**

Elicit and use evidence of student thinking. (Elicit evidence of student thinking; Interpret evidence of student thinking; Respond to evidence of student thinking.)

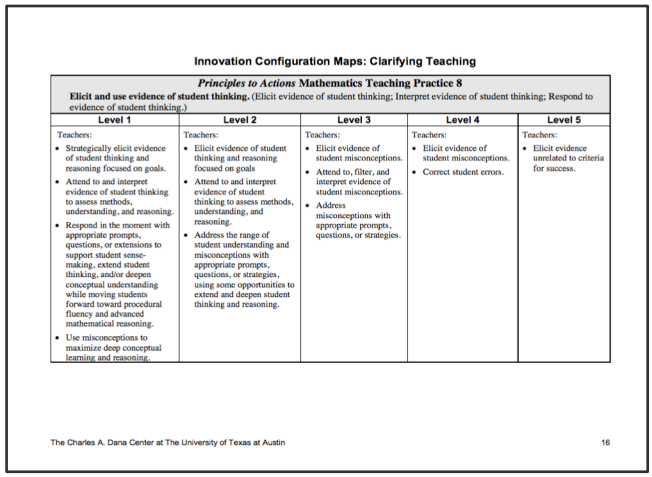
Level 1	Level 2	Level 3	Level 4	Level 5
Teachers: • Strategically elicit evidence of student thinking and reasoning focused on goals. • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Respond in the moment with appropriate prompts, questions, or extensions to support student sense-making, extend student thinking, and/or deepen conceptual understanding while moving students forward toward procedural fluency and advanced mathematical reasoning. • Use misconceptions to maximize deep conceptual learning and reasoning.	Teachers: • Elicit evidence of student thinking and reasoning focused on goals • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Address the range of student understanding and misconceptions with appropriate prompts, questions, or strategies, using some opportunities to extend and deepen student thinking and reasoning.	Teachers: • Elicit evidence of student misconceptions. • Attend to, filter, and interpret evidence of student misconceptions. • Address misconceptions with appropriate prompts, questions, or strategies.	Teachers: • Elicit evidence of student misconceptions. • Correct student errors.	Teachers: • Elicit evidence unrelated to criteria for success.

The Charles A. Dana Center at The University of Texas at Austin 16

The University of Texas at Austin
Charles A. Dana Center

Innovation Configuration Maps

Elements of Innovation Configuration Maps: Footnotes



Innovation Configuration Maps: Clarifying Teaching

***Principles to Actions* Mathematics Teaching Practice 8**

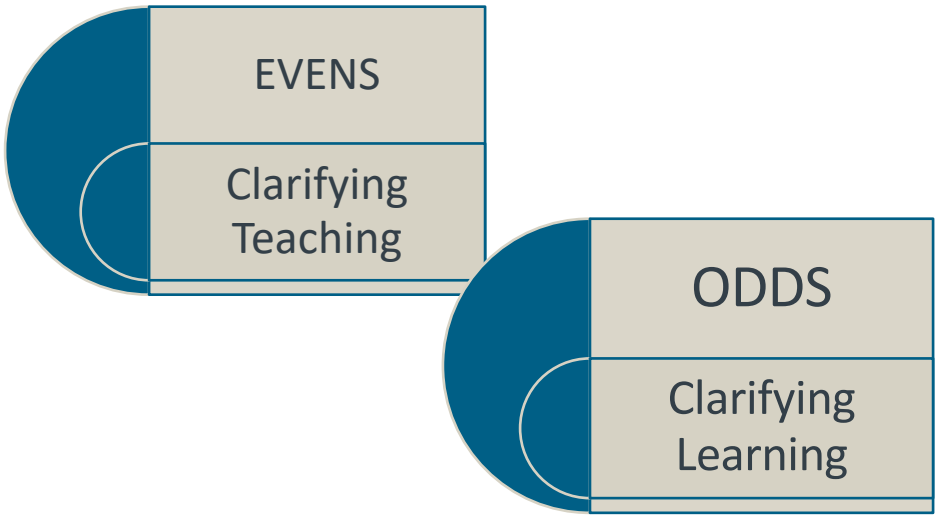
Elicit and use evidence of student thinking. (Elicit evidence of student thinking; Interpret evidence of student thinking; Respond to evidence of student thinking.)

Level 1	Level 2	Level 3	Level 4	Level 5
Teachers: • Strategically elicit evidence of student thinking and reasoning focused on goals. • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Respond in the moment with appropriate prompts, questions, or extensions to support student sense-making, extend student thinking, and/or deepen conceptual understanding while moving students forward toward procedural fluency and advanced mathematical reasoning. • Use misconceptions to maximize deep conceptual learning and reasoning.	Teachers: • Elicit evidence of student thinking and reasoning focused on goals • Attend to and interpret evidence of student thinking to assess methods, understanding, and reasoning. • Address the range of student understanding and misconceptions with appropriate prompts, questions, or strategies, using some opportunities to extend and deepen student thinking and reasoning.	Teachers: • Elicit evidence of student misconceptions. • Attend to, filter, and interpret evidence of student misconceptions. • Address misconceptions with appropriate prompts, questions, or strategies.	Teachers: • Elicit evidence of student misconceptions. • Correct student errors.	Teachers: • Elicit evidence unrelated to criteria for success.

The Charles A. Dana Center at The University of Texas at Austin 16

The University of Texas at Austin
Charles A. Dana Center

Look at MTP 8: Elicit and Use Evidence of Student Thinking



The University of Texas at Austin
Charles A. Dana Center 24

Virtual Walk-Through: Inside Mathematics

Image credit: SergeiKorolko / Thinkstock

What IC map descriptors do you see evident in the video?

Be specific in your observations.

The University of Texas at Austin Charles A. Dana Center 25

IC Maps

Clarifying Learning

What did you notice about…

- how students revealed their mathematical understanding and reasoning?
- how students reflected on their mistakes and misconceptions?
- Assessed and monitored their own progress?

Clarifying Teaching

What did you notice about…

- how the teacher elicits evidence of student thinking at strategic points during the lesson?
- how the teacher made in-the-moment decisions on how to respond to students?

The University of Texas at Austin Charles A. Dana Center 26

Applications of Innovation Configuration Maps

How could you and your staff apply IC maps as part of your ongoing efforts to improve teaching and learning?

- Build shared learning
- Support peer observations
- Clarify classroom observations for leaders
- Plan implementation supports
- Facilitate coaching conversations
- Support self-reflection

How can IC maps improve our teaching practices and support equity for students?

What do you think?

Image credit: Rawpixel/iStockphoto

Imagine you just walked into a classroom.

How do you know what students are thinking?

What actions would you observe?

Engage with the Dana Center

facebook.com/utdanacenter

@UTDanaCenter

Conference Hashtag: #ncsm2019

The University of Texas at Austin Charles A. Dana Center 29

Contact Information

Visit the Dana Center at utdanacenter.org

Mary Davis
Professional Learning Facilitator
K–12 Services, Math
Charles A. Dana Center
marydavis@austin.utexas.edu
@Mary_Davis_UTDC

Denise Thornton
Professional Learning Facilitator
K–12 Services, Math
Charles A. Dana Center
denisethornton@austin.utexas.edu
@UTDCDenise

The University of Texas at Austin Charles A. Dana Center 30